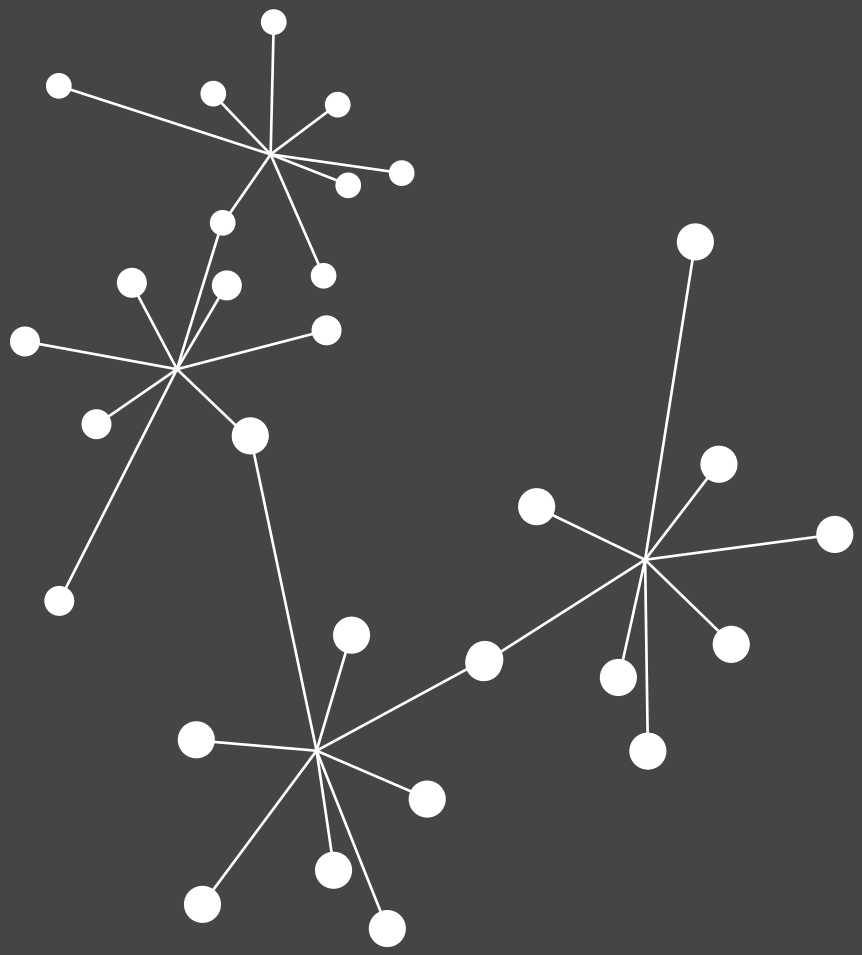

UNIVERSITY UNDERGRADUATE *research and arts* FORUM

April 13, 2012

Michigan State University
April 13, 2012

Welcome to the 14th annual 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. Approximately 560 students from 13 different colleges are participating in today's event. These students were mentored by 300 faculty members.

As one of the nation's leading research institutions, MSU offers a breadth of experiences and opportunities that actively engages 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.

We encourage our student participants, faculty members, mentors, and our guests 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.

Acknowledgements

We acknowledge President Lou Anna K. Simon and Provost Kim Wilcox's continued support of undergraduate education and research at Michigan State University. UURAF received support, guidance, and planning from Associate Provost Douglas Estry; Dean Cynthia Jackson-Elmore from the Honors College; several undergraduate associate and assistant deans, and Dr. Korine Wawrzynski, Director of 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 offer special thanks to the UURAF Team, Robert Coffey and Vaughn Love, 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 Cassie Nealis, '12, and Kristen Miller, '12, both Studio Art majors with graphic design concentrations.

Awards Ceremony

To recognize exemplary scholarly achievements, monetary prizes will be awarded. One first-place award ($100)* will be given in each category. 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. The Editorial Board 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.

Please join us at 4:00 PM for the awards presentation in Parlors BC 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.

*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.

Table of Contents

UURAF Schedule of Events

All events occur in the MSU Union

Event/Time	Location
MORNING REGISTRATION 8:15 AM – 9:15 AM, Registration for morning oral and poster programs	2nd Floor Concourse
ORAL PRESENTATIONS, 9:00 AM – 12:30 PM 8:30 AM – 9:00 AM, Download PowerPoint presentations onto room computers 9:00 AM – 12:30 PM, Presentations delivered throughout morning	Parlors B and C Green Room Lake Erie Room Lake Huron Room Lake Superior Room MSU Room Tower Room
POSTER DISPLAYS, 9:30 AM – 11:30 PM 8:30 AM – 9:30 AM, Set up posters in assigned location 9:30 AM – 11:30 AM, Display and judging time for posters 11:30 AM – 12:00 PM, Students take down their posters	Ballroom Gold Rooms A and B Parlor A
Morning Snack Break: 8:30 AM – 11:00 AM in the 2nd Floor Concourse	
Break to Reset Rooms for Afternoon Sessions 11:30 AM – 12:30 PM	
AFTERNOON REGISTRATION 12:00 PM – 12:45 PM, Registration for afternoon oral programs 12:30 PM – 1:15 PM, Registration for afternoon poster programs 12:30 PM – 2:00 PM, Registration for performances	2nd Floor Concourse
ORAL PRESENTATIONS, 12:30 PM – 3:30 PM 12:00 PM – 1:00 PM, Download PowerPoint presentations onto room computers 12:30 PM – 3:30 PM, Presentations delivered throughout afternoon	Parlors B and C Green Room Lake Erie Room Lake Huron Room Lake Superior Room MSU Room Tower Room
POSTER DISPLAYS, 1:00 PM – 3:30 PM 12:30 PM– 1:30 PM, Set up posters in assigned location 1:30 PM – 3:30 PM, Display and judging time for posters 3:30 PM – 4:00 PM, Students take down their posters	Ballroom Gold Rooms A and B Parlor A
PERFORMANCE DEMONSTRATIONS, 1:00 PM – 2:15 PM Performances throughout afternoon	Parlor C
Afternoon Snack Break: 2:00 – 4:00 PM in the 2nd Floor Concourse	
AWARD CEREMONY, 4:00 PM All UURAF participants, faculty, and guests are encouraged to return for the awards ceremony.	Parlors B and C

Poster Presentation Room Assignments

Morning Posters will be displayed from 9:30 AM – 11:30 AM.

Category	Location
Agriculture & Animal Science, Section 1	Gold Room
Biochemistry & Molecular Biology, Sections 1 & 2	Gold Room
Cell Biology, Genetics & Genomics, Sections 1 & 2	Ballroom
Communication Arts & Sciences, Section 1	Gold Room
Education, Section 1	Ballroom
Engineering, Computer Science, & Math, Sections 1 & 2	Ballroom
Environmental Sciences & Natural Resources, Section 1	Parlor A
Health, Food, & Wellness, Section 1	Ballroom
History, Political Science, & Economics, Section 1	Gold Room
Humanities & Performing Arts, Section 1	Ballroom
Linguistics, Languages, & Speech, Section 1	Ballroom
Microbiology, Immunology and Infectious Disease, Section 1	Gold Room
Physical Science, Section 1	Parlor A
Psychology-Sections 1 & 2	Ballroom
Social Sciences, Section 1	Parlor A
Social Work, Section 1	Gold Room

Afternoon Posters will be displayed from 1:30 PM – 3:30 PM.

Category	Location
Agriculture & Animal Science, Sections 2 & 3	Parlor A
Biochemistry & Molecular Biology, Section 3	Gold Room
Cell Biology, Genetics & Genomics, Sections 3 & 4	Ballroom
Communication Arts & Sciences, Section 2	Gold Room
Education, Section 2	Ballroom
Engineering, Computer Science, & Math, Section 3	Ballroom
Environmental Sciences & Natural Resources, Sections 2 &3	Ballroom
Health, Food, & Wellness, Section 2	Gold Room
Humanities & Performing Arts, Section 2	Ballroom
Linguistics, Languages, & Speech, Section 2	Ballroom
Microbiology, Immunology and Infectious Disease, Sections 2 & 3	Gold Room
Physical Science, Section 2	Parlor A
Psychology-Sections 3 & 4	Ballroom
Social Sciences, Sections 2 & 3	Gold Room

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 Room Assignments

Morning Oral Presentations begin at 9:00 AM and run continuously until 12:30 PM.

Category	Room Location
Communication Arts & Sciences, Section 1	Green
Digital Media, Section 1	Lake Erie
Education	Tower
Environmental Sciences & Natural Resources, Section 1	Parlor C
History, Political Science, & Economics, Section 1	MSU Room
History, Political Science, & Economics, Section 2 *(Note: Session begins at 11:15 AM)*	MSU Room
Humanities & Performing Arts, Section 1	Parlor B
Humanities & Performing Arts, Section 2	Lake Huron
Linguistics, Languages, & Speech, Section 1 *(Note: Session begins at 11:00 AM)*	Parlor C
Social Science, Section 1	Lake Superior

Afternoon Oral Presentations begin at 1:00 PM and run continuously until 3:30 PM.

Category	Room Location
Biochemistry & Molecular Biology *(Note: Session begins at 12:30 PM)*	Tower
Cell Biology, Genetics, & Genomics	Lake Huron
Communication Arts & Sciences, Section 2	Green Room
Digital Media, Section 2	Lake Erie
Digital Media, Section 3	Parlor C
Environmental Sciences & Natural Resources, Section 2	MSU Room
Humanities & Performing Arts, Section 3	Parlor B
Social Science, Section 2	Lake Superior

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. An index of student presenters is located at the back of the program book.

Agriculture and Animal Science

Poster Presentations

A COMPARATIVE LIFE CYCLE ASSESSMENT OF WINTER LETTUCE PRODUCTION IN TWO CLIMATIC ZONES FOR MIDWESTERN MARKET
Rachel Plawecki
Category: Agriculture and Animal Science, Section 1
Poster #: 1
Location: Gold Room, 9:30 AM - 11:30 AM
Mentor(s): Mike Hamm (Community, Agriculture, Recreation, and Resource Studies)

This project compares the environmental impact of leaf lettuce production in two climatic zones, one close to the consumer market and one distant, via a Life Cycle Assessment using SimaPro 7.3. A site-specific scenario is first analyzed with organic leaf lettuce locally grown in an East Lansing, Michigan hoop house. This is compared to a hypothetical scenario, modeled using average industry data, with leaf lettuce conventionally grown in California then shipped to East Lansing. The system boundaries used in this analysis extend from the manufacturing of farm production inputs to a hypothetical retail gate. We assumed the consumer drove the same distance to the retailer in each case. Results demonstrate that the distant system exhibits 4.3 times the CO2 'footprint' per kg of lettuce. This nonlocal system also resulted in greater nuclear emissions, emissions to surface water, resource use, and damage potential among others as demonstrated via the SimaPro simulation.

MICROSATELLITE GENOTYPING OF RHAGOLETIS CINGULATA POPULATIONS
William Armstrong
Category: Agriculture and Animal Science, Section 1
Poster #: 2
Location: Gold Room, 9:30 AM - 11:30 AM
Mentor(s): Jim Smith (Entomology)

Rhagoletis cingulata Loew (cherry fruit fly; CFF) is one of 65 described species in the genus Rhagoletis (Diptera: Tephritidae) distributed throughout temperate regions of the globe. In Michigan CFF is an insect that infests the native Prunus serotina Ehrh. (black cherries). CFF additionally infests Prunus avium L. (sweet cherries) and Prunus cerasus L. (sour cherries) grown agriculturally. Therefore, in active cherry production areas of Michigan CFF is considered a major pest. This study attempted to characterize the genetic relationship of flies that infest native black cherry hosts and flies that infest pertinent agricultural cherries. Adult CFF were sampled from yellow sticky traps in three habitats (native black cherries, active orchards, abandoned orchards) and two distinct geographic localities (northern and southern) in Michigan during July of 2007. The genetic relationships of the populations under study were examined using allelic variation at ten microsatellite loci. Analysis of molecular variance (AMOVA) showed no evidence of genetic differentiation for either habitat or geography. Therefore, the CFF in flight at any given time appear to represent a large, genetically undifferentiated metapopulation. An additional population of reared CFF adults derived from infested sour cherries at the northern locality augmented the study. Population structure analysis with the addition of the reared population showed evidence of genetic differentiation from the CFF sampled from yellow sticky traps. This indicates that the CFF actually reared from northern Prunus cerasus locality represent some subset of the flies found in flight.

LAMINITIC PAIN SCALE FOR HORSES
Susan Thompson, Katharine Lee
Category: Agriculture and Animal Science, Section 1
Poster #: 3
Location: Gold Room, 9:30 AM - 11:30 AM
Mentor(s): Deborah Wilson (Large Animal Clinical Sciences)

Laminitis is a very painful inflammation of the equine foot that frequently becomes chronic. Many horses are euthanized once they develop this condition, because of the pain they experience. We do not know how many horses can recover from this condition, and we do not know how long it takes for recovery to occur. In order to facilitate monitoring and documentation of the progress during recovery from this disease, a very detailed and sensitive assessment system is required. None currently exist. The purpose for this study was to develop a detailed and behavior-based assessment system that can be applied to videotaped footage of horses with laminitis. Published scoring systems for pain in horses were refined and incorporated into the development of a precise and sensitive scale. The new scale was applied to both laminitic and non-laminitic horses under a system with blinded evaluators to determine its specificity and sensitivity. The eventual goal of the study is to use the new scoring system to monitor response to treatment and progress to recovery in 6 horses with laminitis.

CONTROL OF THE PARASITIC WEED FIELD DODDER IN GLYPHOSATE-RESISTANT SUGAR BEETS
David Reif
Category: Agriculture and Animal Science, Section 1
Poster #: 4
Location: Gold Room, 9:30 AM - 11:30 AM
Mentor(s): Christy Sprague (Crop and Soil Sciences)

Field dodder (Cuscuta spp.), a parasitic weed not common to Michigan, was found growing on frost-seeded red clover in some Michigan fields. Sugarbeet and many other broadleaf species are hosts for field dodder. A greenhouse experiment was conducted in the fall of 2011 at Michigan State University to examine the effects of glyphosate on field dodder established on glyphosate-resistant sugarbeet. Dodder seeds were planted in pots after glyphosate-resistant sugarbeet reached the cotyledon stage. At one and two weeks after visual dodder attachment to sugarbeet (4-6 leaf beets), plants were treated with glyphosate at 0, 0.42, 0.84, and 1.68 kg a.e./ha. Dodder was evaluated for control; and sugarbeet and dodder were harvested for fresh and dry biomass, 14 DAT. Dodder reduced sugarbeet biomass by 40-90%. For dodder control and biomass there was a significant interaction between the duration of dodder attachment at application and glyphosate rate. Herbicide treatment did not affect dodder control (14 DAT) or biomass for the one week after attachment application timing. However, glyphosate application rate did influence dodder control and biomass for the two weeks after attachment application timing. Dodder control was 86% with 1.68 kg a.e./ha of glyphosate at this timing. Even though all glyphosate rates provided some dodder control, there was still living dodder on all sugarbeet plants, 14 DAT, indicating that additional glyphosate applications or herbicides with different modes of action are needed to effectively manage this weed and reduce the risk of sugarbeet yield loss.

HOW ELECTRIC FENCES USED TO EXCLUDE BLACK BEARS AND BLACK BEAR BAITING SITES AFFECT NON-TARGET WILDLIFE SPECIES
Marie Stevenson
Category: Agriculture and Animal Science, Section 1
Poster #: 5
Location: Gold Room, 9:30 AM - 11:30 AM
Mentor(s): Gary Roloff (Fisheries and Wildlife)

Electric fencing, as well as black bear baiting is a popular tool in wildlife management and research. Baiting is used to draw certain problem bears from an area, or draw them into a trap in order to be marked and released for valuable research. Fencing is used as a human-wildlife conflict prevention tool and protection of apiaries, crops, gardens, and garbage sites. Hence, electric fencing and bear baiting is an important tool to multiple stakeholders, including wildlife managers, in affecting wildlife behavior. Little information exists on how non-target wildlife species interact with electrical fencing that is designed to either contain or exclude target species, and how they interact at bait sites intended for target species. The affects that electrical fencing and bait sites might have on non-target wildlife species can be influence by fence design and specific bait combinations, and stakeholders should implement means of both that are effective but also minimize negative impacts on non-target species. Based on the non-species that are drawn to each site and their behavior within the site could give important information on disease transfer probability, inter-species behavior and species to species conflict. I quantify the frequency of visits and

behavior of and between individuals and species assemblage at electrical fence and bait sites. This research will provide a better understanding of how different fence designs and different bait and baiting sites affect non-target species and result in best management practices to minimized non-target wildlife negative impacts.

FUNGI: NOT SUCH FUN-GUYS
Christopher Kimble
Category: Agriculture and Animal Science, Section 1
Poster #: 6
Location: Gold Room, 9:30 AM - 11:30 AM
Mentor(s): Carl Boehlert (Material Science)

Fusarium graminearum is a small fungus responsible for head blight in oats and barley and is therefore a detriment to crops in the U.S. These organisms reproduce sexually using ascospores which they eject from themselves using tiny "spore cannons," or asci. This study will observe F. graminearum under a scanning electron microscope to fully understand the physiology and determine any underlying cellular origins of these cannons. The size, morphology, and spatial distribution of the cannons will be measured for several samples. The poster presentation will describe the functions of the surface features of this fungus material. This study will also compare this fungus to other similar organisms which affect plants.

PHENOLOGY OF R. JUNIPERINA AND THEIR ASSOCIATED PARASITOIDS ON THE MSU CAMPUS
Megan Frayer
Category: Agriculture and Animal Science, Section 1
Poster #: 7
Location: Gold Room, 9:30 AM - 11:30 AM
Mentor(s): James 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, which include many 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. Emergence curves were constructed during summer 2011 for 106 adult flies that emerged from collected pupae between July 2 and August 9, as well as 30 parasitoid wasps (Utetes sp.) that emerged from the pupae between August 1 and August 31. The post-diapause eclosion time (PDET) for R. juniperina was 110 days, considerably longer than typically observed in other Rhagoletis species. Wasp PDET was approximately 10-20 days longer (130 days on average). To determine larval infestation rates and periods of infestation, juniper berries were collected weekly from late-August to mid-November 2011 at the Farm Lane bridge site. Collected fruit were held over vermiculite for 3-4 weeks to allow larvae to emerge and pupate. The vermiculite was sifted and isolated pupae and fruit were counted in order to determine infestation rates. Larval infestation was observed between Sept. 28 and Nov. 9, with peak infestation (9.1%) occurring October 12.

TESTING THE QUANTITIES OF OXYGEN IN A SOIL SAMPLE USING TWO OXYGEN PROBES AND AN OXYGEN-REDUCTION PROBE
Sam Westra
Category: Agriculture and Animal Science, Section 1
Poster #: 8
Location: Gold Room, 9:30 AM - 11:30 AM
Mentor(s): Ruby Ghosh (Physics and Astronomy), Reza Loloee (Physics and Astronomy), Steven Safferman (Biosystems and Agricultural Engineering)

A 3' clear column was filled with about 2.5' of sand. Into the sand, two different types of oxygen probes and an oxygen-reduction probe (ORP) were buried. These probes recorded the amount of oxygen in the column during and in between feeding cycles. The amount of oxygen registered showed whether the bacteria within the soil were performing aerobic or anaerobic respiration. If it is anaerobic, than metals in the soil are at risk of being oxidized and leeched into the groundwater. The probes showed that during average feedings, respiration remained aerobic, but when overfed, anaerobic respiration occurred.

TWO JOINTS ARE BETTER THAN ONE: JAW ARTICULATION IN THE GREAT WHITE SHARK
Sydny Landon
Category: Agriculture and Animal Science, Section 2
Poster #: 11
Location: Parlor A, 1:30 PM - 3:30 PM
Mentor(s): Michael Gottfried (Geological Science)

The Great White Shark (Carcharodon carcharias) is the largest living predatory shark, and is an important apex predator in many marine ecosystems. White shark feeding often involves jaw protrusion and biting off very large pieces of its prey, which is facilitated by the structure of the jaws and how the upper (palatoquadrate) and lower (Meckel's) jaw cartilages interact and articulate with one another. We note that there are two separate articular surfaces on both the upper and lower jaws, which would allow for both lateral and antero-posterior flexibility during feeding. These "extra" articular surfaces enhance the shark's ability to open its jaws widely and to increase the volume of the mouth cavity during feeding, permitting larger pieces to be removed and swallowed, consistent with Great White Shark feeding behavior. Through dissection and computed tomography (CT) scanning of the White Shark's skull and jaws, we hope to further illustrate the relationship between the White Shark's jaw and skull anatomy and articulation and their facilitation of the predator's feeding habits.

PREVALENCE AND LOCATION OF COSTOVERTEBRAL AND COSTOTRANSVERSE JOINT LESIONS IN THE EQUINE THORACIC SPINE
Lauren Fischer
Category: Agriculture and Animal Science, Section 2
Poster #: 12
Location: Parlor A, 1:30 PM - 3:30 PM
Mentor(s): Hilary Clayton (Large Animal Clinical Sciences)

Back pain affects a horse's performance and welfare. The synovial joints in the spine are sites of painful osseous (bone) lesions. In the thoracic region, each rib forms two synovial joints with the vertebrae: the costovertebral and costotransverse joints. These joints can suffer extensive arthritis and osseous lesions. In humans, lesion severity varies between spinal regions; areas of higher kinematic stress correspond to greater pain. The aim of this project is to determine the prevalence, severity, and location of lesions in the costovertebral and costotransverse joints in horses of different breeds, ages, and work histories. We hypothesize that lesion number and severity will be greater in the cranial thoracic region and increase with age and intensity of workload, but that breed will have no effect. The project involves post-mortem examination of 50 equine spines that have been dissected, disarticulated, and boiled to make osseous changes visible. Each costovertebral and costotransverse joint will be examined for severity and type of osseous lesions and scored on two scales. The first categorizes the lesions into four grades (0=normal, 1=mild, 2=moderate, 3=severe). The second uses a visual analog scale to provide normative continuous data. Descriptive statistics will determine the grade, type, and prevalence of lesions in different spinal regions. A multivariate ANOVA and post hoc analysis will establish correlations between location and severity of lesions with the breed, age, and workload of the horse. This information will help veterinarians predict the presence of lesions in horses with back pain and improve diagnostic techniques.

MOTIVATION OF ART
Zoe Morris, Yuzhu Liu, Kelly Mackie
Category: Agriculture and Animal Science, Section 2
Poster #: 13
Location: Parlor A, 1:30 PM - 3:30 PM
Mentor(s): Robert Root-Bernstein (Physiology)
Our objective for this topic was to explore the relationship between art and science. This was done through our study of Desmond Morris' books, his research on the famous chimpanzee Congo, and his paintings. We also explored the methods of elephant painting, as well as briefly researching childhood finger paintings and comparing that to the work of Congo and the elephants. We found it was hard to make a distinction between Congo's paintings, the elephant's paintings and the children's finger paintings. Our conclusion about art and science can best be summed up by Morris' quote "People today are not scientists or artists…they are explorers or non-explorers. Painting is no longer a craft; it is a form of personal research. I do not think of myself as being part scientist and part artist but simply as being an explorer, part objective and part subjective."

BLOODMEAL SPECIES IDENTIFICATION IN CULEX PIPIENS MOSQUITOES
Geoffrey Grzesiak
Category: Agriculture and Animal Science, Section 2
Poster #: 15
Location: Parlor A, 1:30 PM - 3:30 PM
Mentor(s): Edward Walker (Microbiology and Molecular Genetics)

The Culex family of mosquitoes is a key vector of West Nile Virus (WNV) in the greater Chicago area. Determining what species are most commonly hosts for mosquito bloodfeeding could lead to a better understanding of WNV's cycle. In order to complete this goal, DNA and RNA are extracted from the abdomens of bloodfed Culex, PCR of various vertebrate gene targets, direct sequencing and BLASTing of sequences to determine the closest species match. Additionally, PCR-based molecular identification of Culex species and RT-PCR virus detection are used to detect which hosts are infected, and which mosquitoes carry the virus. This research can be used in the control of WNV in the greater Chicago area.

BEHAVIORAL SYNDROMES AND DIET COMPOSITION: AN EMPIRICAL APPROACH TO THE BOLD-SHY FORAGING HYPOTHESIS IN BLUEGILL SUNFISH
Ben Staton, Kacie Jonasen
Category: Agriculture and Animal Science, Section 2
Poster #: 16
Location: Parlor A, 1:30 PM - 3:30 PM
Mentor(s): Gary Mittelbach (Kellogg Biological Station)

Many studies have shown that individual fish show differences in their propensities to explore new habitats. The bold-shy foraging hypothesis predicts that exploratory (bold) individuals are more likely to enter open water where food is more abundant, thus achieving better body conditions than less exploratory (shy) individuals. In the summer of 2011, we assigned personality scores to individual juvenile bluegill (Lepomis macrochirus) based on laboratory foraging trials in the presence of a predator. These fish were marked individually and placed in an experimental pond with a predator for several weeks. This semester, we are dissecting the fish and identifying the gut contents to classify them by open water or shallow water prey items. By analyzing the stomach contents in this way, we hope to verify that the bold fish feed in the open water whereas the shy fish feed in the protection of the vegetation. Change in body condition before and after retrieval from the pond will be used to estimate growth. This will be compared with personality score to determine if the boldest fish are truly growing the most. This project could have implications for the field of fish biology because larger females are known to have more eggs. Thus a bolder female should have a higher reproductive capacity throughout her life due to increased growth.

SPECIES SPECIFIC BEHAVIOR AND GROWTH PERFORMANCE AS MEASUREMENTS OF ANIMAL WELFARE IN PASTURE-RAISED PIGS: A CASE STUDY
Allison Bunting
Category: Agriculture and Animal Science, Section 3
Poster #: 20
Location: Parlor A, 1:30 PM - 3:30 PM
Mentor(s): Dale Roseboom (Animal Science), Laurie Thorp (Residential Initiative on the Study of the Environment)

Recent consumer interests in sustainability and animal welfare have increased niche market production in animal agriculture. In this case study, the behavior of pasture raised pigs was examined. In spring 2011, two gestating Yorkshire sows were brought to the Michigan State University Student Organic Farm (MSU SOF) and raised organically for the last third of their gestation. The 18 Berkshire x Yorkshire offspring were reared as "Certified Organic" according to National Organic Program standards. Pigs were rotationally flash-grazed as a group through fields of clover, post-harvest brassica, corn, and sod. They were housed in a dirt lot when no crops were available. Pigs were contained using electric fencing. Shelter and straw bedding were provided. A nipple water system provided water and pigs were given ad libitum access to a corn-soybean meal based diet. Pigs were harvested at approximately 180 days of age and sold at an average of $6.00/lb hanging weight to the MSU SOF Community Supported Agriculture group and MSU Culinary Services. A swine ethogram was derived and behavioral observations were made from weaning to harvest. These observations were taken during morning, afternoon, and evening using the scan sample method to gather a complete behavior distribution table for the pigs as a group. Growth and performance measures such as average daily gain, average daily feed intake, and feed to gain ratio were calculated. These measurements and behavioral

observations were analyzed using information from previously published studies and several philosophical paradigms to assess the well-being of the pigs.

EFFECTS OF PARASITISM ON MUSCLE LIPID CONTENT IN TWO DIFFERENT MORPHOTYPES OF LAKE TROUT (SALVELINUS NAMAYCUSH)
Andrew Bartholomew
Category: Agriculture and Animal Science, Section 3
Poster #: 21
Location: Parlor A, 1:30 PM - 3:30 PM
Mentor(s): Cheryl Murphy (Fisheries and Wildlife)

Despite the detrimental consequences of sea lamprey on fish populations in the great lakes, understanding of the sub lethal effects of these parasites on the lipids of lake trout is limited. We analyzed lipid contents of muscle tissue from siscowet and lean trout that had been parasitized by lamprey in their natural ecosystem. Siscowet lake trout support a significant percent of body fat and inhabit the depths of Lake Superior; lean trout contain less muscle lipid and dwell in the shallower waters of the littoral/ pelagic zone. We tested the hypothesis that unparasitized trout would contain higher amounts of muscle lipids than parasitized trout and varying morphotypes would exhibit differences; specifically, leans would display a greater reduction in lipids than siscowets. Field samples of lake trout were collected from Lake Superior and distinguished as both the siscowet or lean morphotype, and parasitized or unparasitized; parasitized lake trout were sub-divided by their puncture wounds as type A or type B. Lesions penetrating muscular tissue were classified as type A, while abrasions piercing skin were categorized as type B. For each category, 4-6 samples were processed, with 3 trials per sample, using a chloroform-methanol lipid extraction protocol. Interpretation of preliminary results suggests that parasitized samples contain lower lipid levels than unparasitized samples. Furthermore, samples with type A wounds exhibit a greater decrease in lipid content than samples with type B lesions. This study suggests that sea lamprey parasitism can affect the bioenergetic mechanisms of lake trout and potentially disrupt growth and reproductive processes.

DIETARY EFFECTS OF OMEGA-6 AND OMEGA-3 FATTY ACIDS ON THE HEALTH OF WEANED DAIRY CALVES
Caroline Ylioja, Alicia Centeno, Nicole Martinec, Claire Vanderson, Sarah Woodruff
Category: Agriculture and Animal Science, Section 3
Poster #: 22
Location: Parlor A, 1:30 PM - 3:30 PM
Mentor(s): Elizabeth Karcher (Animal Science), Nathalie Trottier (Animal Science)

The overall health and longevity of replacement heifers is critical to dairy operations and is ensured by proper development of their immune systems. The objective of this study was to test the hypothesis that an equal ratio of dietary omega-6 and omega-3 fatty acids will positively impact the immune system of weaned dairy calves. Twenty seven 16-week-old dairy heifers were randomly allocated to 3 diets: 1) high in omega-6, 2) high in omega-3, and 3) an equal ratio of omega-3 to omega-6. To measure the effects of these diets on immune response, blood samples were collected and exposed to bacterial endotoxin, as well as analyzed for cell membrane composition; rectal temperatures were also monitored following routine immunization. Our presentation will include our data collected thus far, with results expected to show that a diet containing high levels of omega-6 will cause abnormal inflammation of body tissues, which is indicative of an over stimulation of immune response. This study will provide valuable information to dairy producers about how fatty acid levels in the diet can be manipulated to improve the immunity of replacement heifers.

E. COLI GROWTH ON TREATED CARROTS
Lai Phan
Category: Agriculture and Animal Science, Section 3
Poster #: 23
Location: Parlor A, 1:30 PM - 3:30 PM
Mentor(s): Pascal Kamdem (Packaging)

The objective is to stimulate Michigan's economy while introducing a safer, more environmentally friendly and health-oriented approach to sanitize and package local grown fresh produce vegetables that will be consumed locally. The experiment will explore the level of growth of Escherichia coli on carrots over an amount of time.This will determine if vinegar can lower the pH and make it non favorable to the growth of Escherichia coli on the carrots. If these approaches are considered, the farmers can

deliver the vegetables to the schools within two weeks rather than a month or longer. The food being delivered will also be less exposed to chlorine, improving the general health of the school cafeterias. This will also stimulate the economy due to more readily utilizing Michigan's local farms. Carbon footprint will also be reduced, leaving a good impression on the environment.

INSULIN RECEPTOR EXPRESSION IN EQUINE ADIPOSE TISSUE: DIFFERENCE IN OBESE AND HIGH STARCH-FED ANIMALS
Katelyn Schermerhorn
Category: Agriculture and Animal Science, Section 3
Poster #: 24
Location: Parlor A, 1:30 PM - 3:30 PM
Mentor(s): Raymond Geor (Large Animal Clinical Sciences), Jill McCutcheon (Pathobiology and Diagnostic Investigation), Patty Sue Weber (Large Animal Clinical Sciences)

Obesity is a large problem in equids, however little is known about equine adipose tissue. It is an important endocrine and metabolic organ, distributed in depots through out the body. Adipose tissue is important in energy metabolism, primarily by the insulin-signaling pathway, and plays a role in metabolic disorders among obese and high starch-fed animals. Studying differences in the insulin-signaling pathway between lean and obese animals fed different diets may identify regulatory sites that control obesity. The purpose of this project was to examine insulin receptor (INSR) expression, the first molecule in the insulin-signaling pathway, in adipose depots from lean and obese ponies fed either a low or high starch diet. Proteins were extracted from five depots of archived adipose tissue from 12 ponies. Proteins were then separated by SDS-PAGE electrophoresis and western blot analysis was used to determine INSR expression levels. This poster contains phenotypic data and western blot data for the INSR in the adipose depots. Results will discuss differences within the same depot and across depots. By analyzing the amount of INSR, we hope to show that INSR expression is different across groups and is a potential regulatory site in the insulin-signaling pathway. Overall, identifying differences in the INSR may lead to a better understanding why overweight/obese animals are prone to metabolic disorders.

LIPID DISTRUBUTION IN BONE, BREAST, AND OFFAL TISSUES OF BROILERS BASED ON DIET
Cara Weisbarth
Category: Agriculture and Animal Science, Section 3
Poster #: 25
Location: Parlor A, 1:30 PM - 3:30 PM
Mentor(s): Julie Moore (Animal Science), Mike VandeHaar (Animal Science)

This project was conducted using approximately 200 broiler chickens to answer three major nutrition-based questions. The birds were fed diets with varying fat contents for duration of eight weeks. The post slaughter analysis included a look into fat distribution of three major tissues of the birds including bone, breast meat, and offal. The breast meat and offal of thirty-six randomly selected birds were freeze dried and subjected to a Soxhlet analysis to determine lipid content. The femur of the bird was used for bone analysis part of the project. One femur from each of the randomly selected thirty-six birds was cleaned, frozen, and subjected to a Soxhlet analysis to determine the fat content. The results were then compared to the data of the bird's diet to determine correlations.

THE DIFFERENCE IN MATERIAL MAKEUP OF GENERAL FACE POWDERS
Jennifer Jones
Category: Agriculture and Animal Science, Section 3
Poster #: 26
Location: Parlor A, 1:30 PM - 3:30 PM
Mentor(s): Carl Boehlert (Chemical Engineering and Materials Science)

For women in today's society, makeup is an everyday endeavor. On the market, one can find cosmetic product ranging from dollar store material to top-of-the-line mineral wear. In this experiment, the material structures of general face powders, purchased from local supermarkets, are compared using a scanning electron microscope. Each facial powder sample exhibits similar properties, like color and size, but, each sample comes from a different cosmetic brand. These brands range from twenty five US dollars to just five US dollars. The samples include Covergirl pressed facial powder ($5.99), Loreal facial powder ($8.94), Mineral Wear facial powder ($8.94), and American Beauty perfect mineral facial powder makeup ($24.99). By comparing each powder brand under a scanning electron microscope, one will be able to observe if the material structures of the samples change with the variation in price. In other words, this experiment tests if the quality of woman's face powder changes as the general cost varies.

Biochemistry and Molecular Biology

Oral Presentations

THERMODYNAMIC MODELING OF RHOMBOID EXPRESSION IN DROSOPHILA MELANOGASTER
Irina Pushel
Category: Biochemistry and Molecular Biology, Section 1
Location: Tower Room, 12:30 PM
Mentor(s): David Arnosti (Biochemistry and Molecular Biology)

Regulation of gene expression within a cell takes place via numerous mechanisms from transcription through translation. Our interests lie in developing a model to explain how transcription factor (TF) binding to DNA at known binding sites can affect the strength of gene expression. In determining these effects, we increase our understanding of gene expression beyond DNA sequences, giving us tools to analyze such complex processes in other systems, including applications in medicine. To better understand the effects of enhancer architecture on gene regulation, we examined expression of rhomboid, a dorsal-ventral patterning gene expressed during development in early blastoderm embryos. Combining quantitative gene expression data from Drosophila embryos with known DNA-level information about the rhomboid enhancer, we developed a fractional occupancy model, depicting rhomboid expression as a function of three TFs: Dorsal, Twist, and Snail. This model takes a novel approach, considering interactions between TFs in addition to single-TF contributions to rhomboid expression. Using expression data from single and multiple binding site mutations in addition to the wild type enhancer, we were able to gain more insight into the role of each TF in the system. We did this by testing various hypotheses for the cooperative and quenching interactions between TFs, reflecting different biological hypotheses. This allowed us to establish patterns in TF interactions and gave us further insight into how gene expression may be regulated during transcription.

PLA/PGA AS A DRUG DELIVERY DEVICE FOR TREATMENT OF LEBER CONGENITAL AMAUROSIS
Craig Pearson
Category: Biochemistry and Molecular Biology, Section 1
Location: Tower Room, 12:45 PM
Mentor(s): Melissa Baumann (Chemical Engineering and Materials Science), Simon Petersen-Jones (Small Animal Clinical Sciences)

Leber Congenital Amaurosis (LCA) is a group of incurable diseases of the retina. One major form results from mutations of genes in the retinoid cycle responsible for supplying photoreceptors with 11-cis-retinal, a lack of which leads to complete blindness. Studies in dogs have shown that direct injections of a synthetic version of 11-cis-retinal into the vitreous humor result in improved vision with no harmful side effects. However, injections must be repeated regularly to maintain the dosage necessary for restoring human vision. Thus, the present study sought to develop a device for sustained drug delivery over several months. The copolymer poly(D,L-lactide-co-glycolide) (PLA/PGA) is recognized for its biocompatible properties and controlled degradation rate, making it an ideal vehicle for intravitreal drug release. Samples of the delivery device were fabricated by dissolving 100 mg of PLA/PGA and 4 mg of the synthetic retinoid in acetone, a common solvent, followed by evaporation in a silicone mold, yielding an incorporated polymer/retinoid complex. Samples were immersed in 5 mL balanced salt solution to simulate the vitreal environment. Aliquots were removed at designated times, and drug release was measured using absorbance data obtained with a NanoDrop spectrophotometer. Trials examined the effects of PLA:PGA ratio and molecular weight, species of synthetic retinoid, and temperature on the drug release kinetics. The study identified relationships between PLA/PGA composition and rate of in vitro degradation, and related temperature to the breakdown of specific retinoids. Overall, measurable drug release was observed, thus establishing the feasibility of this device for sustained delivery.

THE ROLE OF THE DEGENERATE VIBRIO CHOLERAE GGDEF VCA0965 IN C-DI-GMP PRODUCTION, BIOFILM FORMATION AND MOTILITY

Jessica Hunter

Category: Biochemistry and Molecular Biology, Section 1
Location: Tower Room, 1:00 PM
Mentor(s): Benjamin Koestler (Microbiology and Molecular Genetics), Christopher Waters (Microbiology and Molecular Genetics)

Biofilms are multicellular communities encased in a protective extracellular matrix that are of great importance to human health due to their ability to cause chronic, recurrent infections. Diguanylate cyclases (DGCs) are bacterial enzymes of crucial importance to biofilm formation because of their ability to make the second messenger cyclic di-GMP (c-di-GMP). In the majority of bacteria, c-di-GMP plays an important role in biofilm formation and motility (bacterial swimming). DGC activity is believed to be dependent on a GG(D/E)EF active site motif, however approximately 25% of known DGCs are predicted to have a degenerate active site. The Vibrio cholerae protein VCA0965 is a DGC presumed to be inactive because it possesses a degenerate AGDEF active site. We have shown that overexpression of VCA0965 in V. cholerae causes a two-fold reduction in motility and increased biofilm formation. Additionally, we inactivated the allosteric RxxD inhibitory domain of VCA0965, which binds c-di-GMP to inhibit enzyme activity, by site-specific mutagenesis. Overexpression of the VCA0965 RxxD mutant in V. cholerae resulted in greater motility repression, hyper-biofilm formation, and a significant increase in c-di-GMP levels. Furthermore, we detected c-di-GMP production when wild type VCA0965 was overexpressed in Escherichia coli BL21(DE3), which does not produce detectable c-di-GMP. Based on these results, we conclude that VCA0965 is capable of synthesizing c-di-GMP. This suggests the GG(D/E)EF motif is more tolerant of substitutions than is currently believed and that many of the DGCs predicted to be inactive may actually be able to make c-di-GMP and contribute to bacterial biofilm formation.

INCORPORATION OF PALMITIC AND STEARIC ACIDS INTO PLASMA LIPID FRACTIONS OF LACTATING DAIRY COWS

Sarah Schmidt

Category: Biochemistry and Molecular Biology, Section 1
Location: Tower Room, 1:15 PM
Mentor(s): Adam Lock (Animal Science)

Transport of fatty acids (FA) in the bloodstream involves various plasma lipid fractions including phospholipids (PL), cholesterol esters (CE), triglycerides (TG), and non-esterified fatty acids (NEFA). The mammary gland preferentially utilizes FA from plasma TG and NEFA, thus changes in the profile and concentration of these fractions may impact milk fat synthesis. Effects of dietary palmitic and stearic acids on the concentration and profile of plasma lipid fractions were evaluated in an experiment with a crossover arrangement. Sixteen lactating Holstein cows were assigned to dietary treatments supplemented with palmitic acid (PA) or stearic acid (SA). The concentration of each lipid fraction was not affected by treatment. The PA and SA treatments increased the concentration of C16:0 and C18:0, respectively, in TG. For C16:0, values were 29.7 vs. 18.2, and for C18:0 they were 29.5 vs. 36.4 g/100 g FA (PA vs. SA treatment, both $P<0.0001$). PA treatment also increased C16:0 in NEFA and PL fractions ($P<0.0001$), but not in CE ($P=0.24$). Likewise, the SA treatment increased C18:0 in NEFA and PL fractions ($P<0.01$), but not in CE ($P=0.9$). The majority of C16:0 and C18:0 were transported in PL with 73.6 vs. 71.4% of total plasma C16:0 (PA vs. SA treatment, $P=0.08$) and 90.5 vs. 88.3% of total plasma C18:0 (PA vs. SA treatment, $P=0.006$) within the PL fraction. Results demonstrate that the PA and SA treatments increased the concentration of C16:0 and C18:0, respectively, across plasma TG, PL, and NEFA, but did not alter concentrations of lipid fractions.

AN OCTAHEME PROTEIN IN A NOVEL SPECIES OF BEGGIATOA

Jason Siebert

Category: Biochemistry and Molecular Biology, Section 1
Location: Tower Room, 1:30 PM
Mentor(s): Eric Hegg (Biochemistry)

We identified an octaheme protein in a novel orange Beggiatoa bacterium which is proposed to be a hydroxylamine oxidoreductase. This protein is implicated in the deep orange color that is the prime characteristic of this bacterium. Beggiatoa is normally a clear or white filamentous bacterium which is found in microbial communities on the ocean floor, however due to the high heme content it displays a deep orange color. In order to confirm the enzymatic activity of the proposed hydroxylamine oxidoreductase we purified the suspected protein from the supernatant of the frozen cell sample. We then measured the specific activity of the protein using three different substrates, nitrite, hydroxylamine and hydrazine. We then

further purified the protein by using an ammonia sulfate in order to precipitate out the protein as well as then precipitate out the active protein and reconstitute it in a Tris-buffer solution, and took the specific activity of this purified protein. We observed activity using all three of the substrates; we were then able to further confirm the enzyme activity by using an in-vitro gel assay, and comparing this in gel assay to both a heme stain as well as a Coomassie blue stain. This allowed for us to confirm hydroxylamine oxidoreductase, hydrazine oxidoreductase and nitrite reductase activity. Are initial results showing a higher rate of activity for hydrazine oxidoreductase and nitrite reductase activity than hydroxylamine oxidoreductase activity.

PROTEIN INTERACTION AND METAL-BINDING STUDIES OF UREASE ACCESSORY PROTEINS
Sneha Grandhi
Category: Biochemistry and Molecular Biology, Section 1
Location: Tower Room, 2:00 PM
Mentor(s): Robert Hausinger (Microbiology and Molecular Genetics)

Bacterial ureases are implicated in several urinary and gastrointestinal diseases, including kidney stone formation, pyelonephritis, gastritis, peptic ulcer disease, and gastric cancers. This metalloenzyme hydrolyzes urea and leads to increasing pH with the production of NH3. In nature, the accessory proteins UreD, UreE, UreF, and UreG of the enzyme urease are required to relay two divalent nickels into the di-nuclear active site of the UreABC apoprotein. We studied a soluble complex containing the maltose-binding-protein (MBP) fusion of UreD, UreF, and UreG. In vitro pull-down experiments using MBP-UreD:UreF:UreG showed that it did not bind wild-type UreE or H144*UreE, a functional C-terminal truncation mutant, in the presence of nickel, zinc, or the chelator EDTA. To test a technique to probe metal-binding sites , we used chromium, which is known to form strong ionic bonds with histidine residues of proteins, and H144*UreE, which has known metal-binding residues that aid in dimerization. When exposed to air, solvent-exchange-labile Cr(II) oxidizes into solvent-exchange-inert Cr(III). Exposure of H144*UreE bound Cr(II) to oxygen resulted in the presence of dimeric and multimeric bands on non-reducing SDS-PAGE gels. To confirm dimerization, we are preparing H144*UreE* mutations at the two known metal-binding sites: the dimer interface and at an external metal binding site (H96A and H110/112A, respectively.) Confirmation of a dimeric species linked by chromium using mass spectrometry would enable further metal-binding site studies on the urease accessory proteins, which have unknown metal binding sites.

SUBSTRATE PRO-SIGMA K CHANGES THE DETERGENT SOLUBILITY OF METALLO-INTRAMEMBRANE PROTEASE SPOIVFB
Yang Zhang
Category: Biochemistry and Molecular Biology, Section 1
Location: Tower Room, 2:15 PM
Mentor(s): Lee Kroos (Biochemistry and Molecular Biology)

SpoIVFB, a metallo-intramembrane protease in Bacillus subtilus, controls the activation of sigma K factor by cleaving pro-sigma K during late stages of spurolation process. The cleavage processing has been engineered in E.coli. Our original aim is to do structural study for the enzyme. However, previous results show that different detergents result in poor solubilization of SpoIVFB from E.coli membrane. And the detergent solubilized enzyme shows very weak activity. Recently I find that when the catalytic inactive form SpoIVFB coexpressed with its substrate, the detergent solubility of the enzyme changes dramatically: all the detergents have been tested result in good solubilization. In addition, the catalytic inactive enzyme is able to form a robust complex with its substrate in detergent dodecyl maltoside and the complex behavior is quite different in the presence of ATP or not. It is consistent with the fact ATP triggers the cleavage processing. And it suggests ATP may cause a conformational change of the enzyme-substrate complex.

SPORULATION PATHWAYS IN MYXOCOCCUS XANTHUS- AN ANALYSIS OF PROTEIN-PROTEIN INTERACTIONS BY FRUA
Ben Labbe
Category: Biochemistry and Molecular Biology, Section 1
Location: Tower Room, 2:30 PM
Mentor(s): Lee Kroos (Biochemistry and Molecular Biology)

Myxococcus xanthus is a bacterium that forms spores in response to starvation. To begin the process of cellular aggregation and spore formation, two major proteins, MrpC and FruA, act cooperatively as transcription factors to positively or negatively regulate the transcription of thousands of genes. This study aims to find other potential functions of FruA by analyzing its interactions with other proteins. The attachment of a six-histidine protein allows the use of a nickel-ion column to determine what protein interactions are taking place in the cell when FruA is expressed.

PHYLOGEOGRAPHY OF SNOW AND ROSS'S GEESE ACROSS THE SPECIES' RANGE

Emily Cannell
Category: Biochemistry and Molecular Biology, Section 1
Location: Tower Room, 2:45 PM
Mentor(s): Kim Scribner (Fisheries and Wildlife)

Quantification of levels of genetic variation within and between species of Snow (Chen caerulescens caerulescen)and Ross's (Chen rossii) geese is important to quantify effects associated with long-term vicariance (evolutionary effects) on changes in spatial genetic structure that have occurred more recently due to geographic changes in the distribution of breeding areas across the arctic and wintering areas. This information can be used to determine if the species integrity of the goose species has been compromised as a result of the expansion in geographic range. Individuals (n=529) from 24 breeding populations, from Eastern Russia to the northern portion of North America, were used. I used PCR to amplify and sequence a 198 base pair region of the maternally inherited mitochondrial DNA control region and identified haplotypes. I calculated measures of genetic diversity and estimated inter-population variance in frequency of mtDNA haplotypes. I found 48 haplotypes comprising two evolutionary divergent lineages. Each population had between 2 and 12 haplotypes present. Results indicate that the largest genetic component of variation was attributed to differences between goose species, while less genetic variation was found between different populations within a species. Results indicate that overlapping wintering areas of these geese have allowed populations to mix and interbreed, which has contributed to relatively low levels of spatial genetic structure in both species.

Poster Presentations

PALMITIC ACID EFFECT ON IRE1 PROTEIN
Pratheeba Palasuberniam
Category: Biochemistry and Molecular Biology, Section 1
Poster #: 31
Location: Gold Room, 9:30 AM - 11:30 AM
Mentor(s): Christina Chan (Chemical Engineering and Materials Science)

The Endoplasmic reticulum of eukaryotic cells is the cellular compartment where secretory and transmembrane proteins fold into their native conformations and undergo posttranslational modifications that are important for their structure and function. When protein folding in the ER is perturbed, a set of signal transduction pathways is activated, reducing the protein folding load and increase folding capacity. These pathways are collectively termed the unfolded protein response (UPR). IRE1, a transmembrane protein, signals the UPR through a process that involves homodimerization and autophosphorylation. Palmitic acid is found to induce UPR signaling in the ER. We hypothesized that palmitic acid activates the ER stress through IRE1 by directing binding to IRE1, activating the transmembrane protein. To find out the molecular mechanism by which palmitate activates the IRE1 protein, it is necessary to make recombinant IRE1 protein. Since IRE1 is a transmembrane protein, it is challenging to prepare the protein in the bacteria expression system. After we optimize the protein expression and purification experiments, we will test whether palmitic acid directly interacts with the IRE1 protein. In addition, using site-directed mutagenesis to make mutant IRE1 proteins and these proteins function will be compared to those of the wild type IRE1 protein and see how they interact with other biological molecules. By doing so, we can pin point the location on IRE1 where palmitic acid would bind to, see the interaction and ultimately study how they affect the UPR signaling in the ER.

LIVE LONGER DIFFERENT WAYS: GENETIC INTERACTIONS OF TWO CONSERVED LONGEVITY CONTROL FACTORS
Pan Li
Category: Biochemistry and Molecular Biology, Section 1
Poster #: 32
Location: Gold Room, 9:30 AM - 11:30 AM
Mentor(s): Min-Hao Kuo (Biochemistry and Molecular Biology)

The baker's yeast Saccharomyces cerevisiae is used as a model system for aging study. Yeast chronologically ages by losing the ability of division. During the last decade, many mutants have been reported to live longer than their wild type counterparts. Several such long-lived strains bear mutations in highly conserved genes, including RAS2, which is an important growth factor in most cells. Recently, our group found the mutant lacking the triacylglycerol (TAG) lipase TGL3 lives much longer than the wild type. This discovery may indicate that TAG metabolism represents a novel longevity control pathway. Alternatively, TAG lipase may perform an overlapping function with other conserved longevity control factors. To test these two possibilities, we set out

to study the genetic relationship between TGL3 and RAS2. Ras2Δ and tgl3Δras2Δ were created and tested for their chronological lifespan. Compared with ras2Δ, tgl3Δ is slightly longer-lived. Surprisingly, the tgl3Δras2Δ double mutant exhibits a lifespan shorter than either of the single mutants, but still longer than the wild type. More mutants will be created to study the genetic relationships between tgl3Δ and other longevity mutations. In addition, we are interested in knowing whether the ratio of carbon and nitrogen in the medium effects the accumulation of TAG. We grow our yeast in different carbon to nitrogen ratio medium and compare the amount of TAG that accumulated in cell to the cells that grew in normal medium by doing lipid analysis (TLC and GC) of cells.

THE CHARACTERIZATION OF TRANSACTIVATIONAL PROPERTIES OF ATWRI1
Michael Grix
Category: Biochemistry and Molecular Biology, Section 1
Poster #: 33
Location: Gold Room, 9:30 AM - 11:30 AM
Mentor(s): Christoph Benning (Biochemistry and Molecular Biology), Que Kong (Biochemistry and Molecular Biology)

The Arabidopsis thaliana WRINKLED1 (AtWRI1) protein is a key regulator in controlling the accumulation of storage compounds during seed filling. AtWRI1 is an excellent candidate gene for biofuels production by increasing the energy density of biomass through accumulation of triacylglycerols (TAGs) not only in reproductive tissues (seeds), also in vegetative tissue (leaves, roots). AtWRI1 belongs to the AP2/ERF family of transcription factors (TFs) and over expression of AtWRI1 results in up-regulation of a set of genes involved in fatty acids (FA) synthesis, indicating AtWRI1 is a transcriptional activator during seed storage compounds accumulation. However, which region in AtWRI responsible for its transactivational properties is still unclear. The transactivational activity determines the rate of downstream gene expression triggered by the TFs. Understanding of their transactivational properties will facilitate our understandings of TFs functions and provide us a clue for engineering TFs to improve their activities. My research aims to characterize the transactivation domain and its properties of AtWRI1. Different regions of AtWRI1protein were fused to a GAL4 DNA binding domain and the fusion proteins were tested for their transactivational activities in the yeast monohybrid system. So far, we found the activation domain of AtWRI1 is located at the C-terminal part of AtWRI1 (amino acid 306 to 430). Further investigation of which amino acid residue(s) or peptide are essential for its transactivational properties is underway.

MUTAGENESIS OF BACTERIAL RNAP
Raj Lingnurkar, Fadi Assaf, Rakhee Bajaj
Category: Biochemistry and Molecular Biology, Section 1
Poster #: 34
Location: Gold Room, 9:30 AM - 11:30 AM
Mentor(s): Zachary Burton (Biochemistry and Molecular Biology), Yuri Nedialkov (Biochemistry and Molecular Biology)

Bacterial RNA polymerases (RNAPs) have the subunit composition $a_2$bb'ws. The elongating form of the RNAP releases the s subunit. Molecular dynamics simulation of *Thermus thermophilus* (Tt) RNAP with closed and open trigger loop conformations has led to a model for the RNAP elongation mechanism. The trigger loop closes on the nucleotide triphosphate (NTP) substrate during catalysis and opens during translocation, which is the movement of nucleic acids through RNAP. The model involves two GXP hinges (designated H1 and H2) located within the helices at the base of the trigger loop, b' 1230-GEPGTQ-1235 and 1255-GLP-1257. On the nearby bridge helix (b' 1067 to 1104), two clustered glycine hinges (designated H3 and H4) are hypothesized within the segment b' 1076-GARKGG-1081. In addition to these hinges, "switch" residues are identified that may alter their atomic contacts to support catalysis (a closed trigger loop TEC (ternary elongation complex)) or translocation (an open trigger loop TEC). Because of their proposed roles in elongation, hinge and switch residues of RNAP on the b and b' subunits are targets for in vitro mutagenesis. Because of the complexity of the RNAP structure, a polygenic vector encoding the closely related *Escherichia coli* (Ec) RNAP was constructed to co-express a, b, b' and w subunits. Mutant RNAPs, which carry a histidine$_6$-tag, are purified by Ni^{2+} chromatography followed by heparin chromatography. RNAPs are assayed for transcriptional elongation rates and fidelity in vitro. A number of combined substitutions are under construction to test for possible synergistic effects that might indicate coupling of hinges and switches in transcription.

EXPRESSION OF HYDROGENASE INSIDE YEAST MITOCHONDRIA FOR BIOLOGICAL HYDROGEN PRODUCTION

Eric Young, Karin Hanisch
Category: Biochemistry and Molecular Biology, Section 1
Poster #: 35
Location: Gold Room, 9:30 AM - 11:30 AM
Mentor(s): Eric Hegg (Biochemistry and Molecular Biology)

Hydrogenase is a unique type of enzyme that produces hydrogen gas. The enzyme accomplishes this task by combining substrate electrons and protons. The hydrogen gas produced can then be reacted with oxygen gas as a renewable energy source. While this may all seem very simple, there is one major drawback to active hydrogenase enzymes: they are severely damaged by oxygen. This presents a potential bottleneck in producing hydrogen gas by limiting the conditions in which hydrogenase can be active, specifically only anaerobic (without oxygen) conditions. In nature, there are degenerate mitochondria, called hydrogenosomes, which contain hydrogenase. Therefore, we hypothesize that if we insert a hydrogenase into the mitochondria of yeast, the environment will not have enough oxygen to destabilize the enzyme. We plan on using microbiology techniques, such as homologous recombination, to insert the hydrogenase into the mitochondrion. We believe yeast grown under anaerobic conditions with an active hydrogenase will yield a unique yeast strain that can use the electron transport chain of the mitochondria, without oxygen. This will allow the yeast to grow faster, while continuously producing hydrogen gas to be harvested for human energy purposes. We hope by creating this yeast strain with a working hydrogenase enzyme, it will paint a clearer picture of the evolution of hydrogenosomes and provide a new alternative to producing biological hydrogen gas.

ELUCIDATING THE ROLE OF GLUCAN BINDING SITES IN GLYCOGEN SYNTHASE

Mohammad Fassia
Category: Biochemistry and Molecular Biology, Section 2
Poster #: 40
Location: Gold Room, 9:30 AM - 11:30 AM
Mentor(s): Jim Geiger (Chemistry)

Glycogen synthase is an enzyme that produces starch polymers from ADP-glucose. Despite glycogen synthase being a well-studied protein, many of its mechanisms still remain unknown. Previously, Dr. Geiger's lab observed the existence of multiple glucan binding sites on the perimeter of glycogen synthase. The objective of this research project is to elucidate the function of these glucan binding sites to greater understand the mechanisms that regulate glycogen synthesis. Site-directed mutagenesis will be utilized to alter the structure of the glucan binding sites. Following mutagenesis, kinetic assays will be performed to determine the effect of glucan binding on the enzyme's activity. By understanding the role glucan binding sites, structure and composition of starch can possibly be regulated, thus allowing for the enzyme's further application in food science and renewable materials.

ADAPTATION TO ANAEROBIC CONDITIONS BY CHLAMYDOMONAS REINHARDTII

Travis Saari
Category: Biochemistry and Molecular Biology, Section 2
Poster #: 41
Location: Gold Room, 9:30 AM - 11:30 AM
Mentor(s): Eric Hegg (Biochemistry and Molecular Biology)

Chlamydomonas reinhardtii is a model organism used to study green algae and for alternative-energy production. C. reinhardtii is of great interest to researchers, as it is able to produce hydrogen gas—a clean and carbon-free source of energy—while using energy derived from photosynthesis. A remarkable enzyme, [FeFe]-hydrogenase, is responsible for hydrogen production by the organism. However, this enzyme is oxygen sensitive and is only synthesized under anaerobic (oxygen-free) conditions. This enzyme synthesis is regulated on the genetic level, meaning that it is produced only when the gene is turned on (i.e. under anaerobic conditions). The expression of many genes are controlled by a promoter—a sequence of DNA directly preceding the gene. In my project, I have fused the hydrogenase promoter to the reporter gene G-luciferase; when the gene promoter is activated under anaerobiosis, the reporter gene is turned on and I can visually observe the hydrogenase gene expression in vivo. Using this reporter gene, I can truncate or mutate the hydrogenase promoter and directly determine which regions are critical for hydrogenase gene expression. Currently, we have identified several putative promoter regions utilizing motif discovery tools/databases and are testing their importance for anaerobic expression. With this knowledge, we hope to adapt this organism for industrial hydrogen production.

IMPROVING ALKALINE PEROXIDE PRETREATMENT OF BIOMASS USING METAL CATALYSTS
Alexander Toulokhonov
Category: Biochemistry and Molecular Biology, Section 2
Poster #: 42
Location: Gold Room, 9:30 AM - 11:30 AM
Mentor(s): Eric Hegg (Biochemistry and Molecular Biology), Vaidyanathan Mathrubootham (Biochemistry and Molecular Biology)

Biofuel production from plant biomass requires pretreatment procedures to remove lignin, a polymer, which surrounds cellulose and hemicellulose. Alkaline hydrogen peroxide (AHP) delignification is a widely used method for totally chlorine-free (TCF) delignification of lignocelluloses (bleaching) because it utilizes and releases relatively benign reactants and byproducts. However, certain challenges hinder the process from reaching its full potential and achieving practical reaction rates. These challenges include great quantities of required base, carbohydrate degradation, and non-productive side reactions that consume large amounts of hydrogen peroxide. In order to lower the pH and hydrogen peroxide loading required for efficient delignification of biomass, we are developing homogenous metal based catalysts for the activation of hydrogen peroxide. The hypothesis is that metal based catalysts would activate H2O2 and form more selective reactive intermediates. In these catalysts, the metal acts either as a Lewis acid and forms a metal peroxide species that can act as a potent nucleophile at a significantly lower pH than standard alkaline peroxide conditions or the metal can undergo redox changes and form reactive metal oxo species. Catalysts were tested for their ability to activate H2O2 in the presence of AHP under different reaction conditions and preliminary results indicate slight improvement of the process by some catalysts at high pH conditions and high enzyme loading. Stability studies under various conditions suggest that the ligand backbone needs to be modified to make the catalysts more water soluble and more resistant to high pH and H2O2.

STRUCTURE AND FUNCTION RELATIONSHIP OF ESCHERICHIA COLI BRANCHING ENZYME
Lindsey Gilbert
Category: Biochemistry and Molecular Biology, Section 2
Poster #: 43
Location: Gold Room, 9:30 AM - 11:30 AM
Mentor(s): James Geiger (Chemistry)

Starch and glycogen, two of the world's most abundant polymers, are primarily responsible for energy storage in bacteria, plants and other living organisms. Many enzymes are involved in the synthesis of these macromolecules *in vivo*. Branching enzymes, members of the α-amylase family and glycosyl hydrolase-13 superfamily, are found in all organisms that internally store their energy via starch or glycogen. These enzymes are responsible for catalyzing the "branching" of starch, cleaving the linear α-1,4 glycosidic linkage and reattaching the chain via an α-1,6 bond that serves as a branching point on the amylose. Seven external amylose binding sites were identified on the surface of *E. coli* branching enzyme via protein crystallography. We have strategically mutated the residues in several of these binding binding sites and purified these proteins to compare the relative activities using a glucan-Iodine complex assay. The goal is to show how these sites affect the activity of the enzyme. It has been found that some point mutations have no effect on the enzyme's activity, whereas other mutations effectively kill all activity of the protein. By understanding how the structure of these enzymes affect the overall activity of these proteins, we can begin to understand how other closely related enzymes work and can pave the way to increased starch production and quality.

EXPLORATION OF ALTERNATIVE [FEFE]-HYDROGENASE LOCALIZATION IN THE GREEN ALGA VOLVOX CARTERI
Robin Green
Category: Biochemistry and Molecular Biology, Section 2
Poster #: 44
Location: Gold Room, 9:30 AM - 11:30 AM
Mentor(s): Eric Hegg (Biochemistry and Molecular Biology)

[FeFe]-hydrogenases are unique metalloenzymes capable of reducing protons in solution to hydrogen gas. Multiple species of biological organisms, in particular green algae, can utilize these enzymes as a way to mitigate high reducing potential within the cell to provide alternative means to channel electron flow. There is currently great interest in using green algae as biological hydrogen factories. Their ability to couple energy from photosynthesis to hydrogen production using [FeFe]-hydrogenases

makes them attractive candidates for alternative fuel source development. My research involves the investigation of alternative localization of Volvox carteri, a green algae that has recently been demonstrated to possess hydrogen metabolism. Canonical [FeFe]-hydrogenases are localized to the chloroplasts, where they can shuttle electrons generated by photosynthesis to generate hydrogen gas. Current bioinformatics data collected from my lab suggests that an active [FeFe]-hydrogenase, VcHydA1 may be targeted elsewhere. Our lab has speculated that the hydrogenase in question may be localized to the mitochondria based on additional bioinformatics analysis and similarity between the two organelles in vivo. Current efforts are being directed to elucidate the possible alternative location of VcHydA1. Using a devised methodology of differential centrifugation, hydrogen evolution experiments, immunoblot detection, and various marker assays V.carteri cells have been assayed and screened for hydrogenase activity within the mitochondria. This project has the potential yield new insight into how biological organisms utilize [FeFe]-hydrogenases, possibly diversify the prospect of industrial application. Current data will be reported and future directions for this project will be outlined.

COMMUNICATION BREAKDOWN: ATOMIC RESOLUTION STUDIES OF THE SNAP COMPLEX, A CELLULAR TARGET FOR THE P53 AND RB TUMOR SUPPRESSOR PROTEINS

Jessica Stuart

Category: Biochemistry and Molecular Biology, Section 2
Poster #: 45
Location: Gold Room, 9:30 AM - 11:30 AM
Mentor(s): James Geiger (Chemistry), R. William Henry (Biochemistry and Molecular Biology), Stacy Hovde (Biochemistry and Molecular Biology)

Human small nuclear (sn) RNAs are required for balanced cellular biosynthetic capacity. Interestingly, the levels of many snRNAs are elevated in human cancer, suggesting their overabundance accelerates cellular proliferation during malignancy. Many snRNA genes are targeted for transcriptional repression by the p53 and retinoblastoma (RB) tumor suppressors; two factors whose activity is also lost in most human cancers. Our data suggests that p53 and RB communicate with a transcription factor called SNAPC that is required for elevated transcription of snRNA genes. We are interested in determining the atomic resolution structure of SNAPc using crystallography and X-ray diffraction to understand the communication breakdown in snRNA gene regulation associated with tumor suppressor loss. In these studies, I will employ a partial SNAPC , which contains SNAP190 (1-505), SNAP50, and SNAP43, and is fully functional for snRNA transcription. Our current expression system uses a SNAP190 subunit fused with an N-terminal MBP (maltose binding protein) SUMO tag. However, MBP does not bind tightly to amylose resin, and bleeds through on subsequent purification steps, complicating efforts to obtain a complex with the correct stoichiometry. I will remove the MBP tag and replace it with SUMO-His affinity tag, eliminating the MBP contamination while improving the overall purification efficiency. The recombinant proteins will be affinity purified over nickel resin beads, and complexes further resolved by size exclusion chromatography for subsequent crystallization trials. With improved knowledge of SNAPc structure, we hope to enforce appropriate snRNA regulatory paradigms in disease states.

PCR DETECTION OF THE N314D MUTATION ON THE GALT GENE FOR GALACTOSEMIA TYPE I IN S9 HUMAN EPITHELIAL CELLS

Allison Chan

Category: Biochemistry and Molecular Biology, Section 3
Poster #: 50
Location: Gold Room, 1:30 PM - 3:30 PM
Mentor(s): Douglas Luckie (Cell and Molecular Biology)

Galactosemia Type I is an autosomal recessive disease caused by the N314D point mutation on the galactose-1-phosphate uridylyltransferase (GALT) gene. The N314D mutation occurs with an adenine-guanine transition on the 968th nucleotide on the GALT gene (Elsas et al, 1995). We hypothesized that using our primers designed to amplify segments of DNA on the GALT gene under specific temperatures, controlled cocktail ingredients, and experimentally designed durations of PCR cycles, we will be able to accurately diagnose the presence or absence of the N314D mutation (Elsas et al, 1995). We also hypothesized that the primers designed with the Yaku method will anneal more specifically because the intentional mismatch creates less of a chance of false diagnoses (Yaku et al, 2008). The significance of this research and purpose was to verify that PCR is an efficient and accurate way in diagnosing Galactosemia Type I with our precise primers and annealing temperatures determined. Our research was significant as additional evidence that the Yaku primers produce less false positives in our comparison to non-Yaku primers. Identification of unsuccessful and unexpected amplified DNA was analyzed under agarose gel electrophoresis by comparing the band lengths of the amplified DNA against the 1Kb+ ladder. Our results refuted our hypothesis by portraying the two mutant primers' ability to bind and amplify DNA on wild-type DNA while wild-type primers were unable to amplify DNA on wild type DNA.

PROGESTIN ACTION IN THE POSTMENOPAUSAL HUMAN BREAST

Jaya Gupta

Category: Biochemistry and Molecular Biology, Section 3
Poster #: 51
Location: Gold Room, 1:30 PM - 3:30 PM
Mentor(s): Sandra Haslam (Physiology)

Hormone replacement therapy (HRT) use helps ease menopausal symptoms; however, the hormones administered, particularly progestins (P), are linked to higher breast cancer risk. A possible link is increased proliferation in response to P. We hypothesized that Cyclin E or p27 may be important mediators of progestin-induced proliferation. Cyclin E binds to a cyclin-dependent kinase and is associated with transitioning the cell into the S phase. Nuclear p27 inhibits cell cycle progression. This study focuses on Cyclin E and p27 levels across three HRT treatment groups: no HRT, estrogen (E) HRT, and estrogen + progestin (E+P) HRT. Archival normal postmenopausal human breast tissues were used for immunofluorescence analysis with anti-Cyclin E and anti-p27 antibodies to examine nuclear Cyclin E and p27 levels. Nuclear Cyclin E level was significantly increased in ducts and lobules by E or E+P HRT. There was no difference in Cyclin E level between E and E+P HRT. Nuclear p27 level was significantly decreased in lobules by E HRT, but not in ducts. E+P HRT further decreased nuclear p27 level in both ducts and lobules relative to E HRT. These results suggest that Cyclin E has a role in E and E+P-induced proliferation, whereas P plays a more significant role in decreasing p27. This may explain the role of P in the proliferative response to E+P HRT. Further studies are needed investigating the implications of P regulation of p27 in breast cancer development.

CHLAMYDOMONAS SHUNTS ELECTRONS INTO TRIACYLGLYCEROLS TO AVOID DAMAGE TO PHOTOSYNTHETIC ELECTRON TRANSPORT CHAIN COMPONENTS DURING NUTRIENT STRESS

Cassandra Johnny

Category: Biochemistry and Molecular Biology, Section 3
Poster #: 52
Location: Gold Room, 1:30 PM - 3:30 PM
Mentor(s): Christoph Benning (Biochemistry and Molecular Biology)

Following nitrogen (N) deprivation, microalgae such as Chlamydomonas reinhardtii produce triacylglycerols (TAGs). In a previous mutant screen to identify genes central to TAG metabolism, a Chlamydomonas mutant, designated E12, was found to be deficient in TAG biosynthesis. Mechanistic studies on the low TAG phenotype were performed to determine its biochemical defect, likely the loss of a polar lipid lipase. Besides that, this low-TAG mutant also provided an excellent opportunity to study the significance of TAG accumulation in microalgae. Following N deprivation, E12 exhibited chlorosis (bleaching) and a major loss of viability. This phenotype was reverted by inhibiting the photosynthetic electron transport chain with the herbicide 3-(3,4-dichlorophenyl)-1,1-dimethylurea. This suggests that in Chlamydomonas TAG is synthesized to consume the NADPH generated by the photosynthetic electron transport chain (PETC) to relieve overreduction , which can lead to the production of detrimental reactive oxygen species. If this model is correct, we expect that a second (suppressor) mutation, which can enhance TAG biosynthesis or block the PETC, will suppress the chlorosis phenotype. Mutants were generated in the E12 background and screened for the reversion of chlorosis and 25 suppressor mutants were obtained. Analysis of TAG content, photosynthetic defects, and identification of mutant loci is underway.

DECREASED PROTEIN EXPRESSION AND ACTIVITY OF TRANSGLUTAMINASES IN ARTERIES OF HYPERTENSIVE RATS

Humphrey Petersen-Jones

Category: Biochemistry and Molecular Biology, Section 3
Poster #: 53
Location: Gold Room, 1:30 PM - 3:30 PM
Mentor(s): Stephanie Watts (Pharmacology and Toxicology)

Transglutaminases (TGs) catalyze protein modification reactions, and TG-mediated protein remodeling has been implicated in hypertension. I hypothesized that there would be more TGs in vessels from hypertensive vs normotensive rats. Aorta from deoxycorticosterone acetate (DOCA)-salt (hypertensive) rat and sham (normotensive) control rats were analyzed using immunohistochemistry (IHC), Western blot analysis, and in situ fluorescent detection of active TGs using fluorescein isothiocyanate (FITC) labeled peptides K5 (TG1) and T26 (TG2). IHC exhibited decreased expression of TG1 and TG2 in DOCA vs sham aorta (TG1: DOCA 9.6 ± 3.6, sham 30.5 ± 13.5; TG2: DOCA 2.5 ± 1.7, sham 12.6 ± 5.2 % area stained; $p>0.05$); in situ detection showed decreased activity of TG1 and TG2 in DOCA vs sham aorta (TG1: DOCA 0.848 ± 0.133, sham 1.659 ± 0.114; TG2: DOCA 0.991 ± 0.178, sham 1.880 ± 0.101 mean fluorescence/mm2; $p<0.05$); and Western analysis displayed decreased

protein expressions of TG1 and TG2 in DOCA vs sham aorta (TG1: DOCA 27.8 ± 2.52, sham 51.9 ± 13.0; TG2: DOCA 83.2 ± 3.85, sham 108 ± 5.83 arbitrary densitometry units/alpha actin; $p<0.05$). Less activity and decreased levels of TG1 and TG2 seen in hypertensive rat aorta vs control contradicts my hypothesis. For UURAF I will be conducting research using aorta from stroke-prone spontaneously hypertensive rats (SHRSP rats) and normotensive Wister-Kyoto (WKY) rats to determine if spontaneous hypertension affects activity or protein levels of the TGs. I hypothesize that SHRSP rat aorta will show increased TG1 and TG2 expression compared to WKY rat aorta.

CHARACTERIZATION OF THE RNA-BINDING PROTEIN PPR27 FROM TRYPANOSOMA BRUCEI USING FLUORESCENCE POLARIZATION ANISOTROPY

David Dickson
Category: Biochemistry and Molecular Biology, Section 3
Poster #: 54
Location: Gold Room, 1:30 PM - 3:30 PM
Mentor(s): Charles Hoogstraten (Biochemistry and Molecular Biology)

Pentatricopeptide repeat protein 27 (PPR 27) is but one of a large family of highly conserved proteins found in Trypanosoma Brucei, the parasite responsible for Human African Trypanosomiasis, commonly known as African sleeping sickness. There have only been six of these PPRs found in humans, while over 35 have been discovered in T. Brucei. Their nonessential role in our bodies makes them an excellent potential drug target to effectively eliminate the parasite while leaving the human host unharmed. Upon full characterization of the protein and its possible function, efforts can be made to discover how to stop it. Previous data suggested a role for PPR proteins in binding unique single-stranded RNA sequences within trypanosomal mitochondria. Our current focus is using fluorescence polarization anisotropy and extensive user-defined curve fitting and data analysis to investigate the possible protein ligand binding interactions for our protein construct. We tested our protein against several homopolymeric fluorescently labeled nucleotide oligomers to obtain the dissociation constant (Kd) for the interaction. Previous work in the Hoogstraten lab has demonstrated preferential binding to G-rich RNA sequences of approximately 9 bases in length. Current work entails testing several other possibilities such as G-rich DNA, both single and double stranded, as well as double stranded RNA. Our goal is to conclusively determine the validity of our hypothesis that PPR 27 prefers G-rich, single-stranded RNA over all other ligands. Future work will likely entail sequence specific binding as well as in depth structural analysis including X-ray crystallography and 2D NMR.

ATOMIC RESOLUTION STRUCTURAL STUDIES OF GLYCOGEN BRANCHING ENZYME AND ITS ROLE IN GLUCOSE METABOLISM AND DISEASE

Hayley Shugart
Category: Biochemistry and Molecular Biology, Section 3
Poster #: 55
Location: Gold Room, 1:30 PM - 3:30 PM
Mentor(s): James Geiger (Chemistry), R William Henry (Biochemistry and Molecular Biology), Stacy Hovde (Biochemistry and Molecular Biology)

Glycogen branching enzyme (BE) plays a crucial role in the branching of glycogen and starch, and is thus profoundly important for glucose metabolism in both animals and plants. In humans, specific mutations in the gene encoding BE cause Glycogen Storage Disease type IV (GSD-IV), which is lethal in infancy. Additional mutations are associated with other metabolic diseases, including cardiovascular, metabolic, and neuromuscular problems caused by defects in glucose metabolism. In my research, I will pursue the atomic structure of human BE for both the wild type and the mutant versions associated with GSD-IV. In order to study BE structure, we initially obtained RNA from mouse and human tissue cultured cells and converted it to cDNA by reverse transcription. PCR reactions were performed to obtain the specific gene that codes for the BE protein. Using restriction enzymes and then a ligation reaction, I inserted the human BE gene into an expression plasmid. Using a transformation protocol, the plasmid was introduced into Escherichia coli in order to over express the BE protein. I plan to purify human BE by affinity chromatography using nickel agarose beads for subsequent crystallization trials. In these studies, I will examine both the apo-BE as well as BE in complex with oligosaccharides to understand the mechanism of oligosaccharide binding. These studies will reveal how genetic mutations in BE associated with human disease affect BE structure and function.

ANALYSIS OF NEURONS IN THE INFERIOR MESENTERIC GANGLION OF HYPERTENSIVE AND NORMOTENSIVE RATS
Sara Dykowski
Category: Biochemistry and Molecular Biology, Section 3
Poster #: 56
Location: Gold Room, 1:30 PM - 3:30 PM
Mentor(s): David Kreulen (Physiology)

Hypertension is a leading health concern in the United States, affecting nearly one third of the adult population. Prevertebral sympathetic ganglia, including the inferior mesenteric ganglion (IMG), innervate blood vessels in the abdomen, which holds approximately 60% of the body's total blood volume. Few studies have assessed how the IMG changes during hypertension. However, studies have shown a link between hypertension and an increase in global sympathetic nerve activity. Increased sympathetic drive results in increased vasoconstriction via sympathetic neurotransmitters, norepinephrine (NE) and neuropeptide Y (NPY). Therefore, I hypothesized that NE and NPY would be increased in the IMG of hypertensive (HT), relative to normotensive (NT) rats. Fluorescence immunohistochemistry was used to label neurons positive for NPY and tyrosine hydroxylase (TH), which is the rate-limiting step in NE synthesis, in frozen-sectioned IMGs from NT and HT rats. Cell counts of neurons positive for NPY and TH were conducted on 20x confocal images to find the average number of neurons per square mm. Student's t-test revealed no significant difference for neurons that displayed colocalization of both NPY and TH per square mm between NT (0.225±0.101, n=8) and HT (0.245±0.104, n=8) rats. In the future, I will analyze the morphological properties of these neurons and compare them to their physiological class to create a more quantitative comparison between NT and HT groups.

INHIBITING THE PRESSURE-INDUCED ADHESION OF METASTATIC CANCER CELLS
Alexander Hoekstra
Category: Biochemistry and Molecular Biology, Section 3
Poster #: 57
Location: Gold Room, 1:30 PM - 3:30 PM
Mentor(s): Marc Basson (Surgery)

Metastasis of cancer cells is the primary cause of death amongst cancer patients, yet the mechanism of metastasis is relatively inefficient – only a small fraction of circulating cancer cells successfully adhere to and colonize distant sites of the human body. When successful, however, metastasis marks the most terminal stage of cancer. The laboratory of Dr. Marc Basson, MD, PhD, MBA, has traced a novel pathway by which physical forces (such as pressure and shear stress in the circulatory system or surgical environment) activate cancer cell adhesion, the principle component of successful metastasis. Recent work has demonstrated that the pressure-stimulated adhesion mechanism involves the interaction of intracellular kinases. The focus of our research is to determine a method for safely inhibiting this kinase activity. To this end, we have demonstrated that pressure-induced cellular adhesion can be reduced through inhibition one of the kinases identified in cancer cells.

PRODUCING ACETYLATED HISTONE H3 BY ZIPPERS-ASSISTED CATALYSIS, ZAC
Soo Kyun Hur
Category: Biochemistry and Molecular Biology, Section 3
Poster #: 58
Location: Gold Room, 1:30 PM - 3:30 PM
Mentor(s): Min-Hao Kuo (Biochemistry and Molecular Biology)

The research project mainly focused on the Zipper-Assisted Catalysis, ZAC system developed in Dr. Min-Hao Kuo's laboratory at the Department of Biochemistry and Molecular biology, Michigan State University. Application ZAC system by taking advantage of high-affinity heterodimerizing leucine zippers from the Fos and Jun family proteins, protein of interest bearing a desired post-translational modification (PTM) was produced (H3 acetylated). The protein substrate, histone H3 and the cognate modifying enzyme, Gcn5 were fused to one of the two leucine zipper domains. When the two leucine zipper-containing recombinant proteins were co-expressed in E. coli, Fos-Jun dimerization brought both Gcn5 and H3 closer, resulting in constitutive acetylation of H3. Presence of successful Gcn5 and accetylated H3 bands were examined using: gel electrophoresis and western blot methods. From the data, accetylated H3 bands (25kD) were hard to determine due to high concentration of antibodies used or possibility that H3 has not been successfully accetylated. Therefore it was inconclusive that the ZAC system successfully lead to H3 acetylation. For further suggestion, higher dilution factor of acetylated antibodies or non-acetylated H3 antibodies could be used to observe if the H3 was successfully inserted.

Cell Biology, Genetics, and Genomics

Oral Presentations

DETECTION OF THE SINGLE BASE MUTATION, C1824T, IN THE LMNA GENE OF HUMAN EPITHELIAL CELLS USING YAKU PCR DESIGN METHOD

Stephen Manning

Category: Cell Biology, Genetics and Genomics, Section 1
Location: Lake Huron Room, 1:00 PM
Mentor(s): Dr Douglas Luckie (Physiology)

The genetic disease Hutchinson Gilford Progeria Syndrome (HGPS) is commonly caused by the de novo, single base pair, mutation C1824T on the 608th codon of the LMNA gene (Gordon et al, 2003). Using the experimental techniques of PCR, gel electrophoresis, genomic DNA extraction, and site-directed primer mutagenesis we designed a PCR-based diagnostic assay to diagnose individuals for HGPS. We hypothesized that using a PCR primer design method published by Yaku et al. the C1824T mutation could be targeted with the specificity needed to distinguish wild-type and mutant genotypes (Yaku et al., 2008). We introduced an intentional mismatch at the 3rd base pair (position #3) in from the 3' end of the primer DNA sequence to destabilize inappropriate annealing. The detection primers were designed to allow Taq to replicate DNA contingent upon a complementary matching of bases at position #1 of the primer (Yaku et al., 2008). The wild-type primer was designed to only replicate wild type DNA, and mutant primers would only replicate mutant DNA. The mutant and wild-type PCR primers amplified bands of approximately 440 and 438 bp with non-specific distinction between wild and mutant DNA. The intentional mismatched sequence at position #3 was designed using a purine-pyrimidine G/T interaction. However, for future experiments modifications to the design would have a purine-purine mismatch or perhaps a position #2 intentional mismatch, opposed to position #3. This research is important for understanding methods of accurately identifying subtle genetic mutations in the human genome, and producing reliable screening methods.

THE ROLE OF EPITHELIAL-DERIVED HYPOXIA INDUCIBLE FACTOR 1α SIGNALING IN ALTERING COBALT-INDUCED GENE EXPRESSION IN DENDRITIC CELLS IN CO-CULTURE

Amanda Bartenbaker

Category: Cell Biology, Genetics and Genomics, Section 1
Location: Lake Huron Room, 1:15 PM
Mentor(s): John LaPres (Biochemistry and Molecular Biology)

Hard Metal Lung Disease (HMLD) is a pathological condition in industrial workers who inhale cobalt. Preliminary data has demonstrated that epithelial-derived hypoxia inducible factor-1 alpha (HIF-1α) is involved in the development of HMLD. Hypoxia is defined as the decrease in available oxygen reaching the cells or tissues of the body. Cobalt is capable of mimicking hypoxia's ability to activate HIF-1α, and HIF-1α plays a significant role in the body's response to these conditions. These results have led to the following hypothesis: **Epithelial-derived HIF-1α signaling regulates dendritic cell function, and thus tissue immunity, through cell-to-cell communication via transcriptional regulation of cytokines, such as interleukins and thymic stromal lymphoprotein (TSLP).** A co-culture system of A549, an epithelial cell line, and DC2.4, a dendritic cell line, was utilized in order to address this hypothesis. HIF-1α was knocked down in the A549 cell line using lentiviral-encoded siRNA. The expression of various cytokines were measured in DC2.4 alone or in co-culture with A549 +/- HIF-1α via quantitative real time polymerase chain reaction assays. The preliminary results suggest that co-culture influences several genes capable of influencing dendritic cell function. This knowledge serves as an intermediate step to the complete acquisition of the signaling pathway between lung epithelial, dendritic, and T helper cells; and contributes to a more thorough understanding of HMLD.

THE BETA 1,3 GLUCAN PARAMYLON IN EUGLENOIDS

Donovan Watza

Category: Cell Biology, Genetics and Genomics, Section 1
Location: Lake Huron Room, 1:30 PM
Mentor(s): Richard Triemer (Plant Biology)

Paramylon, a membrane-bound reserve polysaccharide stored in all photosynthetic euglenoids, is an unbranched beta 1,3 glucan rarely found in most eukaryotes, but regularly found in yeast, fungi, and some bacterial cell walls (Yokota & Kitaoka, 1984), (Tomos & Northcote, 1977), (Marechal & Goldemberg, 1964). Beta 1,3 glucans have both medical and industrial uses. They have been shown to boost innate immune response by binding to glucan receptors on nonspecific leukocytes leading to an increase in cell growth and cytokine production (Vetvicka & Yvin, 2004). They can also serve as a renewable feed stock for biodegradable plastics similar to those in the starch bioplastics industry (Tokiwa et al, 1993). During the course of this study, samples of paramylon were extracted from two euglenoid species, Phacus orbicularis and Monomorphina pyrum, which display distinct paramylon phenotypes. NMR analysis suggests these two species have modified sugar hydroxyl groups unlike the paramylon from Euglena gracilis, the only euglenoid in which paramylon has been studied. Following NMR characterization of the glucans, putative protein synthase genes were identified from cDNA libraries of Phacus and Monomorphina using BLAST (pBLAST) and previously characterized beta 1,3 glucan synthase protein sequence. These results show that these proteins contained a signal tag, hydrophobic membrane spanning regions, hydrophilic active sites, and UDP-glucose binding sites, all of which agree with earlier assumptions regarding paramylon synthase (Marechal & Goldemberg, 1964). By identifying the morphological and biochemical structure of paramylon and identifying putative proteins involved in the synthesis of this unique polymer we move one step closer towards developing primary feedstocks for the production of renewable beta 1,3 plastics which can be produced independent of petroleum distillates.

OVERCOMING BIENNIAL BEARING IN M. DOMESTICA

Christopher Gottschalk

Category: Cell Biology, Genetics and Genomics, Section 1
Location: Lake Huron Room, 1:45 PM
Mentor(s): Steve van Nocker (Horticulture)

Many fruit trees, including the domesticated apple (M. domestica), show a cyclical, two-year pattern of maximal and minimal fruit production. This phenomenon, called biennial bearing, is associated with the production of phytohormones called Gibberellings (GAs) by developing fruit, and their subsequent inhibition of floral initiation for the following season. GAs play a well-known promotive role in flowering in many plants, including the research reference plant Arabidopsis thaliana, but how GAs might repress flowering in other plants has not been studied. Our objective of this research is to investigate the genes and proteins involved with GA-mediate repression of flowering in apple, with the eventual goal of minimizing biennial bearing through biotechnology. We hypothesize that some genes and proteins involved in GA-promoted flowering in Arabidopsis have been adapted for repression in apple. We used a phylogeny-based approach to identify the possible counterparts of Arabidopsis GA/flowering genes in the draft genome of apple. We then experimentally manipulated apple plants (cv. Gala and cv. Honeycrisp) by either removal of all flowers from spurs (to promote floral initiation) or application of GAs (to repress floral initiation). In ongoing work, we are using high throughput sequencing to characterize changes in activity of GA/flowering-related apple genes from these experimental samples and using this data to map potential regulator pathways associated with GA repression of flowering.

4-PRIMER PCR ASSAY AMPLIFIES EXON 8 IN SMN1 FOR SMA PATIENTS USING HUMAN BUCCAL CELLS

Bo Parsons

Category: Cell Biology, Genetics and Genomics, Section 1
Location: Lake Huron Room, 2:00 PM
Mentor(s): Douglas Luckie (Physiology)

Homozygous deletions of exon 7 of the telometric survival motor neuron (SMN1) gene are responsible for 94% of all cases of spinal muscular atrophy. This deletion leaves only the centromeric copy of the gene (SMN2) to produce [truncated] proteins as a result of alternative splicing. A single base pair difference C to T at the 840th base pair of exon 7 is the source of this alternative splicing. Exon 8 of SMN1 also contains a single nucleotide difference, G to A, to SMN2. A tetra-primer ARMS PCR has been used previously to successfully distinguish both genes apart using the base pair differences for both exon 7 and 8. Deletions in exon 8 could in part be responsible for the vast range of phenotypic severity found in SMA. We hypothesized that deletions in exon 8 of SMN1 were one cause of the alternative splicing in the gene. Our 4-primer assay was designed to identify

deletions in exon 8 of SMN1 and SMN2 with SMA type I and II patient DNA, where bands amplified by gene discriminating primers indicate missing nucleotide sequences. Our tetra-primer PCR assay successfully amplified exon 8 of SMN1. The entire exon 8 sequence was amplified (386 bp) and the presence of the exon in SMN1 was distinguished in wild type and SMA type II DNA (161 bp). However, the expected band length for the exon 8, SMN2 discriminating amplification (287 bp) was not detected for all DNA types.

INDUCTION OF INTESTINAL EPITHELIAL DIFFERENTIATION BY INTRALUMINAL DELIVERY OF AN ADENOVIRAL VECTOR CODING FOR SCHLAFEN 3

Sefali Patel

Category: Cell Biology, Genetics and Genomics, Section 1
Location: Lake Huron Room, 2:15 PM
Mentor(s): Marc Basson (Surgery)

We hypothesized that exogenous over expression of Schlafen 3 by direct intraluminal administration of an Ad vector coding for Schlafen 3 cDNA (Ad-GFP-Schlafen 3) would promote supranormal enterocytic differentiation in vivo. The Schlafen 3 cDNA of the rat Schlafen 3 gene was cloned into pShuttleCMV, recombined into the plasmid pAdTrackCMV to create Ad-GFP-Schlafen 3. Ad-GFP-Schlafen 3 infection of IEC-6 cells increased Schlafen 3 protein 3.75±0.32 fold and DPPIV activity 2.06±0.09 fold compared to PBS-treated controls. Ad-GFP infection did not change DPPIV specific activity. Then 1011 vector particles of Ad-GFP-Schlafen 3, Ad-GFP, and PBS alone was injected intraluminally into temporarily obstructed jejunal segments of female rats. 72 hours after injection, GFP-Schlafen 3 levels were measured by Western blot. By real-time qPCR of mRNA from jejunal mucosal scrapings, we observed at 3 days after exposure to the Ad-GFP-Schlafen 3 virus a 2.27±0.39 fold increase in Schlafen 3 expression compared to Schlafen 3 mRNA in control animals with Ad-GFP. And a 4.46±2.07 fold increase in villin expression, 3.75±1.03 fold increased DPPIV expression, and 2.93±0.59 fold increased GLUT 2 expression. Crypt depth did not change but morphometric analysis demonstrated slightly increased villus length. Therefore intraluminal administration of Ad-GFP-Schlafen 3 increases Schlafen 3 expression, inducing enterocyte differentiation in vivo. Schlafen 3 appears to be a key intracellular regulator of intestinal epithelial differentiation. Promoting Schlafen 3 expression may allow us to manipulated enterocyte differentiation and improve mucosal function in vivo, facilitating enteral nutrition and improving survival of patients with mucosal atrophy or short gut syndrome.

GENERATING RESOURCES FOR EVALUATING THE EVOLUTION OF GENOME STRUCTURE FOLLOWING WHOLE GENOME DUPLICATION IN THE FAMILY BRASSICACEAE

David Hufnagel

Category: Cell Biology, Genetics and Genomics, Section 1
Location: Lake Huron Room, 2:30 PM
Mentor(s): Shin-Han Shiu (Plant Biology)

The Brassicaceae family is one of the most well studied and commercially important families among flowering plants, containing both the model organism Arabidopsis thaliana (At) as well as many common food crops including broccoli, cauliflower, mustard, cabbage, turnip and radish. This family also has a history of recent whole genome duplications (WGD) events. One such event is predicted to have occurred in the Raphanobrassica lineage, of which the wild radish, Raphanus raphanistrum (Rr) and Brassica rapa (Br) are members. The major goal of our study is to understand how polyploidization has affected the evolution of duplicate genes in Brassicaceae. To accomplish this, we first used the transcriptome of the wild radish, R. raphanistrum (Rr) to identify over 145,000 transcript fragments. These transcripts were then used to predict R. raphanistrum genes using its newly assembled genome. Combining genome annotation and genome sequences from A. thaliana (At), A. lyrata (Al), B. rapa (Br), and R. raphanistrum (Rr), putative orthologous genes and syntenic blocks have been established between At-Al, At-Br, and At-Rr. We are currently obtaining syntenic blocks between Br-Rr, Rr-Al and Br-Al. This information will be used to assess the pattern of duplicate gene turnover among members of the Brassicaceae family. The outcomes of the study will provide a better understanding of differential gene loss among related species following WGD.

DEVELOPMENT OF A FUNCTIONAL GENOMICS PLATFORM FOR EXPLORING TROPANE ALKALOID BIOSYNTHESIS IN ATROPA BELLADONNA
Matthew Bedewitz
Category: Cell Biology, Genetics and Genomics, Section 1
Location: Lake Huron Room, 2:45 PM
Mentor(s): Cornelius Barry (Horticulture)

Alkaloids are a group of natural compounds of diverse biochemical origins. These molecules show a wide variety of biochemical activities that give them special importance in pharmacology. For example, alkaloids include the opiate morphine, the anti-malarial compound quinine, and the stimulant caffeine. The tropane alkaloids scopolamine and hyoscyamine are synthesized by several members of the Solanaceae family including the Atropa and Hyoscyamus genera. Scopolamine and hyoscyamine are antagonists of the acetylcholine receptor and serve as the active components of several drugs used to treat gastrointestinal disorders. Despite their medicinal importance, the biosynthesis of these compounds is not fully understood, limiting the ability to engineer their production and to synthesize novel derivatives. This project seeks to develop a functional genomics platform to identify the missing steps in tropane alkaloid biosynthesis. An A. belladonna transcriptome has been assembled from a combination of normalized cDNA and tissue specific libraries using the Illumina GA2 platform. The transcriptome contains all of the known genes involved in tropane alkaloid biosynthesis and measurements of transcript abundance indicate that these genes are preferentially expressed in secondary roots. Hierarchical clustering and data mining has identified co-expressed genes that encode enzymes that may be involved in the missing steps of tropane alkaloid biosynthesis and a virus-induced gene silencing (VIGS) system has been developed to test the function of these candidate genes. Progress on functional characterization of these candidate genes will be presented.

IMPROVING ACCURACY OF STURGEON PARENTAGE ASSIGNMENT BY COMBINING DISOMIC AND NON-DISOMICALLY INHERITED MICROSATELLITE LOCI
Megan Niner
Category: Cell Biology, Genetics and Genomics, Section 1
Location: Lake Huron Room, 3:00 PM
Mentor(s): Kim Scribner (Fisheries and Wildlife)

Genetic markers are widely used to determine parentage in natural vertebrate populations. Problems can arise when genomic resources are lacking, particularly in polyploidy species. To improve accuracy of genetic parentage analysis, PCR primers for non-mendelian inherited microsatellite loci (N=12), developed for White Sturgeon (Acipenser transmontanus) (8N) were applied for Great Lakes Lake Sturgeon (Acipenser fulvescens). Inheritance of all loci was established using full sibling A. fulvescens families. Accuracy of parentage was assessed using several statistical methods based on different combinations of disomic and non-disomic loci. Results showed that use of and combinations of disomic and non-disomic loci increased accuracy of parentage assignment but different analytical approaches were required that may limit applications to natural populations.

Poster Presentations

EVALUATION OF THE RELATIONSHIP BETWEEN INJECTION SPREAD, TRANSGENE EXPRESSION, AND AREA OF INITIAL RETINAL DETACHMENT IN DOGS TREATED WITH AAV GENE SUPPLEMENTATION THERAPY
Ashlee Bruewer
Category: Cell Biology, Genetics and Genomics, Section 1
Poster #: 60
Location: Ballroom, 9:30 AM - 11:30 AM
Mentor(s): Joshua Bartoe (Small Animal Clincal Sciences), Simon Petersen-Jones (Small Animal Clinical Science)

Dogs and humans suffer from inherited blindness caused by genetic mutations, and recent clinical trials of retinal gene supplementation therapy in both dogs and humans have determined that treatment is safe and effectively restores vision. Eight dogs were injected with AAV vectors of the following serotypes all expressing GFP: 2/2, 2/5, 2/8. To monitor retinal reattachment and to detect transgene expression, fundus images were taken once daily for ten days and on day 14 and 21 post injection. The aims of this study were to determine if there was spread of retinal detachment post injection prior to retinal reattachment and to determine if transgene expression spread beyond the edge of the detachment. We hypothesized that both conditions would show evidence of spread. In all eyes the area of retinal detachment extended slightly before reattachment. Reattachment was complete on ophthalmoscopic examination at a mean of 1.8 days post injection. The majority

of spread occurred in the first 24 hours before reattachment. Small areas of transgene expression could be seen to extend past the edge of final detachment area in 5/16 of the eyes analyzed indicating that transgene expression spread beyond the extent of the subretinal detachment is possible. Our results indicate that the area of transgene expression strongly correlates to the extent of retinal detachment post subretinal injection. For future gene therapy clinical trials, we would expect the final area of retinal detachment to directly correlate to the area of positive clinical response to treatment.

EVALUATING MOTOR UNIT DISTRIBUTION WITH T2 MRI IN ALS PATIENTS
Mitchell Rozman
Category: Cell Biology, Genetics and Genomics, Section 1
Poster #: 61
Location: Ballroom, 9:30 AM - 11:30 AM
Mentor(s): Jill Slade (Radiology)

The neuromuscular system in ALS and other motor neuron diseases or nerve injuries may undergo a period of muscle denervation in which motor neurons die. Subsequently, other remaining motor neurons may reinnervate muscle altering motor unit distribution. The purpose of this study was to examine motor unit distribution in patients with ALS using T2 MRI. Eleven ALS patients and nine age-matched controls underwent MRI imaging before and after exercise. Subjects performed 2-3 minutes of dynamic dorsiflexion at ~30% of maximal force. MRI spin echo images (TR=1500, TE1=24-30ms, TE2=60ms, 384x224 acquisition matrix) were collected at 1.5T and 3T MRI. Analyses of muscle T2, T2 changes and T2 standard deviation were done with independent t-tests with significance at P< .05. The mean T2 change with exercise was ~ 50% lower for ALS (ALS= 10.8±13.8%, control: 23.2±8%, mean±SD) and the post-exercise T2 standard deviation was significantly greater for ALS (4.6±2.5vs 2.8±0.5). However, half the patients had a T2 change similar to controls (ALST2+ = 20.4±11.3%) and half showed no T2 change with exercise (ALST2-=-0.8±2.5%). Resting T2 was significantly higher for ALST2- (35.6±5.0 ms) compared to ALST2+ (28.7 ±1.4 ms). Maximal muscle force was significantly lower for ALST2- (9.1± N/cm2) compared to ALST2+ (20.8±4.8 N/cm2). Overall, our findings do not show evidence for altered motor unit distribution with ALS. However, ALS patients showed elevated T2 at rest, likely suggesting muscle denervation. Interestingly, some ALS patients had no exercise induced T2 response which may indicate difficulty with muscle activation.

THE COORDINATION OF GROWTH WITHIN AN ORGAN IN DROSOPHILA MELANOGASTER
Sasha Makohon-Moore
Category: Cell Biology, Genetics and Genomics, Section 1
Poster #: 62
Location: Ballroom, 9:30 AM - 11:30 AM
Mentor(s): Alexander Shingleton (Zoology)

In order for organisms to form properly proportioned adults, they must be able to deal with both genetic and environmental disruptions in growth. Previous research has shown that growth of Drosophila imaginal discs (adult organ precursors) is tightly coordinated throughout development, and that the steroid hormone ecdysone may play a role in mediating this coordination. This research aims to further elucidate the role of ecdysone by looking at its involvement in regulating the coordination of growth between parts of a single organ. By perturbing the growth of one developmental compartment in an organ, we can examine the effect on the growth in the other compartments. Further, by modifying the expression of the ecdysone receptor in these compartments, we will be able to test whether ecdysone signaling acts compartment-autonomously to coordinate growth. This research will help further our understanding on how organisms maintain correct proportioned in spite of growth perturbations in developing organs.

DEEP SEQUENCE PROFILING OF THE GRNA TRANSCRIPTOME IN TRYPANOSOMA BRUCEI
Jordan Hindenach, Jasmine Lucas, Benjamin Swanson, Terence Theisen
Category: Cell Biology, Genetics and Genomics, Section 1
Poster #: 63
Location: Ballroom, 9:30 AM - 11:30 AM
Mentor(s): Donna Koslowsky (Microbiology and Molecular Genetics), Yanni Sun (Computer Science and Engineering)

Trypanosoma brucei are parasitic protozoans that are responsible for African Sleeping Sickness. Trypanosomes extensively edit 12 of their mitochondrial mRNA transcripts dependent upon their life phase. Guide RNAs (gRNA) are the driving force behind this unique RNA editing in Trypanosomes, directing the insertion and deletion of uridylates in the pre-edited mRNA transcripts.

Despite their critical role in the editing process, gRNAs have not been completely characterized due to the complexity of the genome. The genome consists of both 22kb maxicircles which encode the mRNAs and approximately 10,000 minicircles, each encoding three to four gRNAs. Previously, gRNAs have been identified using classical sequencing methods. Despite numerous attempts, however, large numbers of the gRNAs needed for the extensive editing required were still unidentified. In this project, we used deep sequencing (Illumina) to characterize the full gRNA transcriptome in the insect stage of the life cycle. Guide RNAs were isolated based on transcript size from three Trypanosoma brucei cell lines. Initial analyses of the read data have identified most of the gRNAs required for RNA editing. In addition, analyses of transcript abundance indicate vastly different expression levels for the different gRNAs.

USING LIPOPOLYSACCHARIDE TRUNCATION MUTANTS TO INVESTIGATE SURFACE CHARACTERISTICS AND METAL REDUCTION IN GEOBACTER SULFURREDUCENS

Michael Paxhia

Category: Cell Biology, Genetics and Genomics, Section 1
Poster #: 64
Location: Ballroom, 9:30 AM - 11:30 AM
Mentor(s): Gemma Reguera (Microbiology and Molecular Genetics)

Lipopolysaccharide (LPS) is a major component of the outer membrane of gram-negative bacteria. Its general structure of a Lipid A base, phosphorylated core and polysaccharide O-antigen protects cells from harm, retains their cell envelope integrity, and allows attachment to different surfaces. In pathogenic bacteria, LPS is well characterized as a means to attach to host cellular membranes. However, LPS is also present in non-pathogenic bacteria. The metal-reducing bacterium Geobacter sulfurreducens has a unique form of LPS lacking the O-antigen and is believed to improve binding of metals through hydrophobic interactions. We created several truncated LPS mutants and characterized their hydrophobic properties and ability to reduce both soluble and insoluble electron acceptors to determine the role of LPS in the reduction of metals, such as iron and uranium. In addition, we investigated the role of LPS in uranium immobilization and reduction, examining the preservation of cell integrity throughout the process. This characterization will broaden our understanding of metal reduction in G. sulfurreducens and lead to the development of biomimetic devices for in-situ remediation of uranium-contaminated environments.

CAN DIET AMELIORATE THE HARMFUL EFFECTS OF A MUTATION? A TEST USING THE VINEGAR FLY- DROSOPHILA MELANOGASTER

Leslie Bell

Category: Cell Biology, Genetics and Genomics, Section 1
Poster #: 66
Location: Ballroom, 9:30 AM - 11:30 AM
Mentor(s): Ian Dworkin (Zoology)

It has long been known in biology that the primary issue is not “Nature vs. nurture,” but in trying to understand the complex interplay in how “Nature” and “Nurture” interact. In *Drosophila melanogaster,* variability in caloric intake has been shown to have a profound impact on body and wing size independent of genetic background, but little is known for how a lower caloric intake will alter the expressivity of mutations that alter wing size. This study looks at how a low versus high nutrition diet influences the severity of the *scalloped*^{E3} (*sd*^{E3}) mutation on wing development. *D. melanogaster* from Samarkand (SAM) and Oregon (ORE) backgrounds with normal and *sd*^{E3} mutations were raised on either high or low nutrition food. The wings and thoraxes of adult flies were imaged to quantify wing area and thorax length. The average thorax lengths showed significant increases from low to high nutrition with no significant difference between genetic background and mutation. Wing area for high versus low nutrition showed a slight significant increase for the wild type flies of SAM and ORE backgrounds as well as in the ORE backcross. These results indicate nutrition had a statistical significance on wing area but likely minor biological impact. Further research on the genetics of wing development is needed to understand why nutritional variation does not cause a significant biological impact.

A SIMPLE BIOINFORMATICS APPROACH TO IDENTIFY TETRANUCLEOTIDE MICROSATELLITES WITH PREDICTABLE HETEROZYGOSITY USING A SINGLE REFERENCE GENOME: APPLICATION TO THE HORSE

Jenna Bozek

Category: Cell Biology, Genetics and Genomics, Section 2
Poster #: 70
Location: Ballroom, 9:30 AM - 11:30 AM
Mentor(s): Pat Venta (Microbiology and Molecular Genetics)

Microsatellite (simple tandem repeat; STR) polymorphisms are used for many purposes in genetics and forensics, including paternity testing and DNA identification. Tetranucleotide STRs (tetraSTRs) are more variable and easier to genotype than the more commonly used dinucleotide repeats (diSTRs). However, identifying tetraSTRs has not been easy, particularly for species such as the horse whose genome appears to lack good tetraSTRs. Our lab has developed a bioinformatics approach to find good tetraSTRs. We hypothesized that this method would be useful even in the horse. TetraSTRs were identified by using the Table browser tool and RepeatMasker track available at the UCSC Genome Browser website. Tetranucleotide repeats were chosen that have high SW scores, and other additional criteria. PCR primers were used to genotype several of these microsatellites in 9 horses of different breeds. 300 tetraSTRs with predicted heterozygosities of at least 0.65 were identified in the entire equine genome. Of these, one for each of the autosome was selected for PCR primer design. Five of six tetraSTRs genotyped had heterozygosities above 0.65. The results strongly support our hypothesis. This method was found to be highly effective even in a species thought to lack good tetraSTRs. The complete panel of horse tetraSTRs identified here is a strong alternative to the horse diSTRs currently in use by commercial and academic institutions. Based upon these results, we believe it is very likely that the method will have broad applicability to any mammalian species.

EFFECTS OF A SUPPRESSED ETS PROMOTER IN PYMT INDUCED CANCER CELLS

Vishnu Pemmaraju

Category: Cell Biology, Genetics and Genomics, Section 2
Poster #: 71
Location: Ballroom, 9:30 AM - 11:30 AM
Mentor(s): Michele Fluck (Microbiology and Molecular Genetics)

The Ets-2 protein is one of a family of transcription factors that are known to control the activity of a number of oncogenes and tumor suppressor genes in higher order eukaryotes. Ets promoters are known to function in close proximity to AP-1 promoters. Recent studies have shown that suppressed AP-1 promoters limit the ability of cancer cells to metastasize. The purpose of this study is to examine the effects of a suppressed Ets promoter. A dominant negative Ets-2 protein will be used to suppress the promoter in Polyoma Middle-T induced Murine breast cancer cells. The mutant genotype was introduced into Polyoma Middle-T induced Murine breast cancer cells by transfection with the FNE2DBD Plasmid. G418 was used as the selectable antibiotic marker. Tests run on the mutant cell lines will include agar and ECM assays to determine growth and anchorage, as well as wound assays to determine cell migration. Results could pave a new path in the search for a better treatment for cancer.

CENTRAL DRIVE TO LOCOMOTOR MUSCLE

David Hurley

Category: Cell Biology, Genetics and Genomics, Section 2
Poster #: 72
Location: Ballroom, 9:30 AM - 11:30 AM
Mentor(s): Jill Slade (Radiology)

Functional Magnetic Resonance Imaging (fMRI) has been shown to assess changes in brain activation and may be particularly useful in studying central motor drive within the primary motor cortex. The purpose of the study was to examine the influence of force on brain activation in locomotor muscles. Specifically, we compared the force correlated activation during different submaximal forces. Nine male runners (age = 26±7 years) performed maximal voluntary contractions (MVC) with the plantar flexors followed by an fMRI scan of their brains to measure primary motor cortex activity during plantar flexion at four intensities (10%, 15%, 20%, and 30% MVC). MRI images were acquired through the whole brain during fMRI. A repeated measures analysis of variance was used to compare the differences in brain activation. Significance was set at $p<0.05$. Motor cortex brain activation (expressed relative to rest) at each force level was 100.94±0.23 (10% MVC), 101.11±0.37 (15% MVC), 101.21±0.18% (20% MVC), and 101.68±0.32% (30% MVC). The MRI measured activation was greater during 20% MVC vs. 10%

MVC and for 30% MVC vs. 20% MVC, as well as comparing force levels that were more than 10% different. The results show that motor drive to locomotor muscles can be measured with fMRI. This technique can be used to explore changes in central drive with exercise or to examine central drive in clinical populations.

PLASMID EXTRACTION PROTOCOL COMPARISONS
Britton Hildebrandt
Category: Cell Biology, Genetics and Genomics, Section 2
Poster #: 73
Location: Ballroom, 9:30 AM - 11:30 AM
Mentor(s): Terence Marsh (Microbiology and Molecular Genetics)
Plasmids are pieces of DNA that exist separate from the host cell's genome. The genes encoded by the plasmid are considered to be nonessential. They replicate independently from the rest of the genomic DNA. Plasmids are able to be horizontally transferred from one bacterium to another. Interestingly, plasmids can even be transferred between members of different species. These mobile units of DNA are responsible for the wide spread dissemination of antibiotic resistance genes. Plasmids also encode for metal resistance, virulence factors, and conjugation. In order to test the function of the plasmid the DNA first must be isolated from the cell. Then the plasmids are isolated from the DNA. There are numerous choices of DNA and plasmid isolation kits on the market. Plasmids were isolated from a farm waste bioreactor community. Plasmid isolation protocols will be compared. Comparisons will be made between the commercially available kits on the market and classic approaches including phenol chloroform extractions and cesium chloride centrifugations.

USING THE ISING MODEL TO PREDICT STRATEGIES IN THE PUBLIC GOODS GAME
Nathaniel Pasmanter
Category: Cell Biology, Genetics and Genomics, Section 2
Poster #: 74
Location: Ballroom, 9:30 AM - 11:30 AM
Mentor(s): Arend Hintze (Computer Science And Engineering)

In evolutionary game theory, the public goods game has been utilized to model the tragedy of the commons. In this game players either pay into the common goods, to everyone's benefit, or withhold their contribution and exploit the commons. The purpose of this research is to develop a mathematical model to describe the evolution of strategies within this game. Using simulations of the game with varied synergy factors and graphing probability of cooperation, holding all other variables constant, yields a graph similar to that of a second-order phase transition. This suggests the evolution of cooperation happens abruptly. If the rate of increase of the synergy factor is sufficiently low, the model exhibits hysteresis near the critical point. These characteristics resemble the phase transition described in the Ising model of ferromagnetism, which is not observed using the standard Maynard Smith equations. The observation of this critical behavior suggests we can describe this dynamic by comparing rate of cooperation and second-order phase transitions. We are attempting this using the Ising model, which exhibits two possible states (spins) and nearest neighbor interactions. Utilizing mean field theory correctly predicted the critical point of cooperation to defection in the 1D model, but failed to show the expected phase transition. Currently, we are still trying to solve the linear game, and intend to extrapolate the solution to the planar model.

RECOMBINATION CAPACITY FOR THE LOXP CONDITIONAL ALLELE FOR INTERFERON REGULATORY FACTOR 6 VARIES BY TISSUE
Krysta Wierzbicki
Category: Cell Biology, Genetics and Genomics, Section 2
Poster #: 75
Location: Ballroom, 9:30 AM - 11:30 AM
Mentor(s): Brian Schutte (Microbiology and Molecular Genetics)

Mutations in the Interferon Regulatory Factor 6 (IRF6) result in cleft lip and palate. Mice that lack Irf6 have craniofacial, skin and limb defects. To study tissue-specific function of Irf6, we created a conditional allele by inserting LoxP sites in introns 2 and 4 of the gene. When the LoxP sites recombine, exons 2 and 3 are deleted and create null allele. We used two different transgenic lines to drive Cre expression, the EIIa-Cre "deleter" and the Pdf9-Cre strains. Since both promoters are expressed early, we expect all cells to have Cre activity that will delete the Irf6 gene in all cells. However with the EIIa-Cre strain, only 1/10 experimental embryos showed the knockout phenotype. Using PCR, we observed both the recombined and unrecombined alleles, suggesting mosaic recombination. Incidentally, with the Gdf9-Cre, we observed the knockout phenotype in 100% (N=6)

of experimental embryos. Our findings suggest that recombination of the LoxP sites at the Irf6 locus was less efficient in with EIIa-Cre compared to Gdf9-Cre. The mechanism for this difference is not known. However, studies showed that Cre recombination can be inhibited by DNA methylation, which also partially regulates Irf6 expression. Since Gdf9 is expressed in oocytes when methylation of the genome is minimal, we speculate that the recombination ability of the LoxP sites at Irf6 is affected by DNA methylation. Finally, our findings suggest that Gdf9-Cre transgenic line is a more reliable "deleter" strain for LoxP sites than the EIIa-Cre strain.

THE ROLE OF THE DNA DEPENDENT PROTEIN KINASE IN THE BLOCKING AUTOPHORYLATION AT THE ABCDE SITES IMPAIRS REPAIR OF ULTRAVIOLET IRRADIATION
Eric-John Kohler
Category: Cell Biology, Genetics and Genomics, Section 2
Poster #: 76
Location: Ballroom, 9:30 AM - 11:30 AM
Mentor(s): Katheryn Meek (Pathobiology)

The DNA dependent protein kinase (DNA-PK) is a large, multi-subunit serine/threonine kinase that is crucial for the non-homologous end joining (NHEJ) pathway of double strand break (DSB) repair. DNA-PK can phosphorylate a number of distinct substrates both in vitro and in vivo. However, perhaps the most relevant target of DNA-PK phosphorylation is it's own catalytic subunit, DNA-PKcs. Thus far, greater than 40 serine and threonine residues in DNA-PKcs have been shown to be phosphorylated, primarily by autophosphrylation, including a cluster of sites called ABCDE (1). It has previously been demonstrated that blocking phosphorylation of ABCDE, through mutation, renders cells sensitive to agents that induce DNA DSBs (2). Interestingly, cells expressing the phopho-blocking ABCDE>Ala mutant are more sensitive than cells that do not express DNA-PKcs at all, suggesting that this mutant exerts a dominate negative effect in the presence of DSBs. Here we examine whether the ABCDE>Ala mutant also affects the repair of types of DNA damage other than DSBs.

PLANT CELL STRUCTURE AND THE ENVIRONMENT
Alan Mundakkal
Category: Cell Biology, Genetics and Genomics, Section 3
Poster #: 80
Location: Ballroom, 1:30 PM - 3:30 PM
Mentor(s): Carl Boehlert (Chemical Engineering and Material Science)

There are millions of different species of plants in the world but each one is suited to survive in a specific environment. Many factors influence how well these plants can survive in certain environments. Two of these major factors are the cellular structure of the plant and its cuticle. The research that will be conducted is focused on the particular relationship between the cellular structure, characteristics of the cuticle and the environment in which the plant thrives. For the study I will be preparing multiple leaves from different species of plants that are native to various environments. My observations will be made by using the scanning electron microscope. I will be looking at the cellular composition of the leaves and stems as well as the cuticle to see how they compare among the different species. Based on my observations and comparisons, I would like to draw a conclusion regarding the relationship about why the particular species is so adapted to surviving in the given environment. First, plants will be selected from four different basic environments: tropical, desert, tundra and temperate. Small samples will be cut from the leaves and stems of the plants. They will then be prepared for the scanning electron microscope through a process of cleaning and gold coating. When viewing the samples I will take pictures and note observations about the samples. Using my observations and information about the species I will be able to make a logical relationship between cell/cuticle structure and environment.

CREATING A NON-GEL BASED ASSAY TO DETERMINE SINE GENOTYPES
Elliot Swift
Category: Cell Biology, Genetics and Genomics, Section 3
Poster #: 81
Location: Ballroom, 1:30 PM - 3:30 PM
Mentor(s): Pat Venta (Microbiology and Molecular Genetics)

Short interspersed nucleotide elements or SINE's are a class of retrotransposable elements that are copied and pasted into seemingly random positions in the DNA. This fact makes them important in protein expression, mRNA splicing, evolution, their

use as genetic markers when tracking genes, among many others. Currently, to phenotypically analyze a sample of DNA for a SINE insertion, one would need to run a PCR on the segment in question followed by running the product through electrophoresis on an agrose gel to visualize the difference in banding size between different genotypes. The object of this research is to create a fluorescence assay that would utilize a TaqMan probe to detect SINE plus alleles and a SYBR green experiment that detects SINE minus alleles. A special TaqMan probe designed for the SINE insertion your studying would anneal to the SINE insertion and upon cleavage a fluorescence signal would be produced. As for the SYBR green experiment, if you can effectively cleave every SINE plus allele and only amplify SINE minus alleles, based on SYBR greens ability to bind to dsDNA with 95% more fluorescence, one could analyze whether the genotype is ++, +- or -- based upon the fluorescence signal produced. With this method, you could analyze a specific SINE insertion over 100's of samples without running a myriad of gels effectively saving valuable time and money.

CABP28k EXPRESSION IN MALE/FEMALE DIABETIC MICE JEJUNUM
Rachel Brock
Category: Cell Biology, Genetics and Genomics, Section 3
Poster #: 82
Location: Ballroom, 1:30 PM - 3:30 PM
Mentor(s): Laura McCabe (Physiology, Radiology)

CABP28k is a calcium-binding protein expressed in tissues such as the intestine and kidneys. Previous Western Blot analysis--done in Fall Semester 2011—identified the gene expression of CABP28k in healthy, male-mice jejunum. I am testing for CABP28k expression in male and female diabetic mice (an experiment we term MF1) to see any up or down regulation of CABP28k. I will also look at differences in CABP28k expression in terms of gender. Currently, 79 jejunum samples from the MF1 harvest have been pulverized with tri-reagent and the RNA has been extracted. RT/PCR test will be run to test for CABP28k expression. Experiment and tests are ongoing. I expect to find a difference based on gender: more CABP28k expression in male than female, or vice versa.

POLY-HYDROXY-VALERATE BIOSYNTHESIS BY PSEUDOMONAS PUTIDA THROUGH LEVULINIC ACID UTILIZATION
Gabrielle Benjamin
Category: Cell Biology, Genetics and Genomics, Section 3
Poster #: 83
Location: Ballroom, 1:30 PM - 3:30 PM
Mentor(s): Michael Bagdasarian (Microbiology and Molecular Genetics)

Our goal is to understand the metabolic pathways and associated genes involved in levulinic acid metabolism while attempting to increase the production of PHV via genetic manipulation of Pseudomonas putida PB 2440.
This is important on a global scale. Plastics made from PHV have numerous environmental and economical advantages over the current plastics derived from petroleum. The most beneficial is that the technology for production is truly “green”. We began by performing a transposon mutagenesis where a HiMar-Gm transposon was inserted into our strain of PB 2440 via conjugation. Chromosomal DNA isolated from these mutants was then transformed into CB1870 by electroporation. Plasmid DNA was isolated and PCR amplified to sequence the DNA flanking the transposon and analyzed using BLAST to identify the associated genes. Sequences from one of these mutants demonstrated that the insertion is in gene PP_2793 encoding for Acyl-CoA-Dehydrogenase that is located close to the genes encoding Acyl-CoA-Oxidoreductase and Acyl-CoA-Synthetase, which could suggest that they may be part of an operon. Other genes essential for growth were identified to encode malate-quinonoxidoreductase and succinate dehydrogenase. We have tested 4 other strains for their ability to use levulinic acid and found that they can not grow on this substrate. The genes for Acyl-CoA-Dehydrogenase in these strains are very different from that encoded on KT2440 chromosome. Our working hypothesis at this time is that the specificity of the Acyl-CoA-Dehydrogenase in KT2440 is responsible for its unique ability to utilize levulinic acid.

CHLOROPLAST GENE MUTATION FREQUENCIES ARE A MONITOR OF REACTIVE OXYGEN GENERATED BY PHOTOSYNTHESIS IN CHLAMYDOMONAS REINHARDTII

Sarah Jaslow

Category: Cell Biology, Genetics and Genomics, Section 3
Poster #: 84
Location: Ballroom, 1:30 PM - 3:30 PM
Mentor(s): Barbara Sears (Plant Biology Department)

Chlamydomonas reinhardtii is a unicellular photosynthetic eukaryote, with a metabolism that resembles that of land plants. My research has focused on the mutations experienced by its chloroplast DNA (cpDNA) under different conditions. I used spectinomycin resistance as a marker of mutation; wild-type cells are sensitive to this antibiotic, which targets the chloroplast ribosomes. Previously, it was found that frequency of mutation in C. reinhardtii chloroplasts was much higher under constant high light than when the cells were grown in low light. But these are not "natural" conditions; a soil alga like C. reinhardtii normally experiences a light-dark cycle. Classical work has shown that growth in light/dark cycles synchronizes cell division and DNA replication. I hypothesize the dark periods will allow chloroplast repair enzymes to correct the damage from reactive oxygen species, which are generated as byproducts of photosynthesis during the light period, resulting in a mutation frequency that will be similar to what was observed in the low light conditions. I also examined a mutant strain of C. reinhardtii which produces lower amounts of triacylglycerols (TAGs) after nitrogen deprivation, obtained from a collaborating research group. This mutant had been deduced to have high levels of reactive oxygen species and decreased cell viability after nitrogen starvation. I hypothesize that under these conditions, this mutant will have an elevated frequency of cpDNA mutations relative to wild-type.

SYMPATHETIC NEUROTRANSMISSION IN MESENTERIC ARTERIES AND VEINS IN SALT-SENSITIVE HYPERTENSION

Jonathan Bomar

Category: Cell Biology, Genetics and Genomics, Section 3
Poster #: 85
Location: Ballroom, 1:30 PM - 3:30 PM
Mentor(s): James Galligan (Pharmacology and Toxicology)

Salt-sensitive hypertension is prevalent in the U.S. and elsewhere. Salt acts in the brain to activate sympathetic nerves which supply the heart and blood vessels. Increases in sympathetic nerve activity cause high blood pressure (hypertension). Previous studies showed that sympathetic control of arteries and veins is altered in deoxycorticosterone acetate (DOCA)-salt rats, an animal model of salt-sensitive hypertension. To begin to investigate salt-induced changes in sympathetic nerve function, dose-response studies were performed in vitro on mesenteric arteries (MA) from normotensive rats. We used computer assisted video microscopy to measure changes in MA diameter caused by norepinephrine (NE, the neurotransmitter released by sympathetic nerves), and to transmural electrical nerve stimulation. Preliminary NE dose-response results from normotensive MA revealed a half maximal effective concentration EC50 of 1-3 μM. Preliminary nerve stimulation results from MA from normotensive rats showed a half maximal stimulation frequency of 2-5 Hz. To verify that the stimulation-induced contractions were neurogenic, MA were bathed with a solution that contained the Na+ channel blocker tetrodotoxin (TTX). Na+ channel activation is required for action potentials in sympathetic nerves. TTX blocked stimulation evoked contractions. Future studies will provide additional data for the work reported here. In addition, future work will investigate venous contractile response in sham rats, and venous and arterial contractile response in DOCA-salt rats. These studies will employ both neurogenic stimulation and drugs and will reveal how salt-sensitive hypertension alters neurotransmission to arteries and veins.

INHIBITION OF SPT DOWN-REGULATES CERAMIDES AND IN TURN Aβ LEVELS IN A MOUSE MODEL OF ALZHEIMER'S DISEASE

Aditi Upadhye

Category: Cell Biology, Genetics and Genomics, Section 3
Poster #: 86
Location: Ballroom, 1:30 PM - 3:30 PM
Mentor(s): Christina Chan (Biochemistry and Molecular Biology)

Serine palmitoyltransferase (SPT) is the first rate-limiting enzyme in the *de novo* synthesis of ceramide, a sphingolipid heightened in Alzheimer's disease (AD) brains. In cell culture, SPT inhibition and consecutive ceramide inhibition has led to a decline in levels of amyloid β (Aβ), a protein that aggregates in the AD brain. Evidence suggests that a high-fat diet may contribute to the elevation of ceramide in the brain. Our lab utilizes an AD mouse model, containing human mutations

pertaining to AD, to assess the effects of L-cycloserine, an SPT inhibitor, on Aβ levels in mice placed on a high-fat diet. Transgenic male mice were crossed with non-transgenic females and their offspring were genotyped using DNA extraction, DNA quantification, PCR, and gel electrophoresis methods to determine transgenicity. Transgenic offspring were placed on one of three diets: a control chow diet, a high-fat diet, and a high-fat diet supplemented with L-cycloserine, delivered subcutaneously. Quantification of Aβ levels in the mouse brains is accomplished using ELISA, Western blotting, and histopathology. Preliminary results have shown that increased ceramide and Aβ levels are associated with a high-fat diet and inhibition of SPT down-regulates ceramide levels *in vivo*. These results suggest SPT as a potential therapeutic target for the treatment of AD.

CHARACTERIZATION OF A NOVEL GENE AFFECTING RNA POLYMERASE FUNCTION IN PLANTS
Rashelle Thompson
Category: Cell Biology, Genetics and Genomics, Section 4
Poster #: 90
Location: Ballroom, 1:30 PM - 3:30 PM
Mentor(s): Steve van Nocker (Horticulture)

RNA polymerase II (Pol II) is the key protein involved in the transcription of DNA into RNA in eukaryotes. During the transcription cycle, the largest subunit of Pol II, RPB1, undergoes pattern-specific phosphorylation on its conserved C-terminal domain (CTD). We discovered a mutation in an unidentified gene of the reference plant Arabidopsis thaliana that disrupts this pattern of phosphorylation, and leads to hyperphosphorylation of the Pol II CTD. This defect is associated with disruption of normal modifications to histones located in transcribed chromosomal regions. To identify this gene, we are using an approach combining positional cloning with whole-genome sequencing. We also identified Arabidopsis counterparts of genes from human and yeast that influence Pol II phosphorylation, and evaluated potential misexpression of these in the mutant. Our data suggests that the unknown gene encodes a protein that is functionally related to a conserved transcriptional cofactor known to play an important role in transcriptional elongation and termination.

CHARACTERIZATION OF THE GUIDE RNA TRANSCRIPT STRUCTURE IN TRYPANOSOMA BRUCEI
Terence Theisen, Jordan Hindenach, Jasmine Lucas, Benjamin Swanson
Category: Cell Biology, Genetics and Genomics, Section 4
Poster #: 91
Location: Ballroom, 1:30 PM - 1:30 PM
Mentor(s): Donna Koslowsky (Microbiology and Molecular Genetics), Yanni Sun (Computer Science and Engineering)

The parasitic Trypanosomes are the causative agents for Leishmaniasis, Sleeping Sickness, and Chagas disease, affecting over 550 million people worldwide. Trypanosomes have a unique mitochondrial mRNA editing mechanism that can be used as a target for novel drugs. RNA editing is the insertion and deletion of uridylates within the transcript and is required for 12 of 18 mRNAs to encode functional mitochondrial proteins. The information required to direct editing is contained within guide RNAs (gRNAs). The details of gRNA transcript expression are not fully understood. Guide RNAs are transcribed from small circular DNA (~ 1 kb) elements called minicircles. There are approximately 10,000 minicircles in the mitochondria with three to four gRNAs encoded per minicircle. Most minicircle genes are found between 18 bp imperfect repeats, and transcription is proposed to start at a 5' RYAYA sequence. In addition, all gRNAs have a post-transcriptionally added poly-U tail (~15 Us). Using Illumina paired-end sequencing, we identified and characterized both the 5' transcriptional start site and the 3' cleavage/poly U-tail addition sites for the insect stage gRNA transcriptome. These data may provide valuable clues for the identification of mini-circle sequence elements involved in gRNA synthesis.

HYDROXYAPATITE SURFACE FEATURES AFFECT OSTEOBLAST MIGRATION
Jeffrey Denison
Category: Cell Biology, Genetics and Genomics, Section 4
Poster #: 92
Location: Ballroom, 1:30 PM - 3:30 PM
Mentor(s): Laura McCabe (Physiology)

Hydroxyapatite (HA), is the mineral component found in bone. HA is thought to help facilitate cell migration, particularly that of osteoblasts (OB) – the cells that mediate bone formation. I HA is often used as a coating on artificial bone implants. The goal of our study is to understanding if HA promotes the migration of OBs and if there are special features of HA that we can target to develop better bone implants that readily integration into the bone. To study the effect of the HA surface and its

characteristics (micro-cracks) on osteoblast migration, I seeded OBs onto HA surfaces and created a 5.4 ± 0.5 mm scratch within the cell monolayer. This scratch test also simulates the cellular environment after bone fracturing, where OB cells are disrupted and separated on opposing sides of the fracture. I measured the migration of OBs into the scratch area (which is cell free) over set intervals of time—being 12, 24, and 36 hours after the initial scratch. The surfaces studied were plastic, HA, and micro-cracked HA (HA-cr). My data indicates that cell migration/scratch healing is significantly increased (> 24%) on HA-cr compared to HA surfaces. Specifically, osteoblasts migrated a greater distance after 24 hours from the initial scratch. This suggests that HA-cr may be more effective as a bone implant coating because it stimulates cell migration. More trials are ongoing for conclusive results.

AUTOGENY WITHIN THE CULEX PIPIENS COMPLEX OF MOSQUITOES.
Stephanie LeValley
Category: Cell Biology, Genetics and Genomics, Section 4
Poster #: 93
Location: Ballroom, 1:30 PM - 3:30 PM
Mentor(s): Megan Fritz (Zoology), Edward Walker (Microbiology and Molecular Genetics)

With the threat that many insect populations pose as a vector of disease, there is a great benefit to better understanding the reproductive distinctiveness displayed by mosquito species. This study aims at elucidating aspects of the genetic characteristics of autogeny within two species of the Culex complex: one frequently displaying autogeny, Culex pipiens molestus, and the other never displaying autogeny, Culex pipiens pipiens. As the rates of autogenous female mosquitoes and the rates of autogeny in their offspring can vary within populations, the study began by characterizing the rates of autogeny within the laboratory colony of Culex pipiens molestus. A focus was also placed on observing the effect of factors that may influence rates of autogeny, specifically larval nutrition during development through the first to fourth instar stages by controlling the larval density of the growing environment and therefore their availability to nutrients in the water. Preliminary data suggests that a lower larval density during early stages of like increases the rate of autogeny as well as the number of eggs produced. To continue understanding the display of autogeny within the Culex species complex, plans include crossing the two phenotypically variant strains to observe the frequency of autogeny in their offspring.

THE USE OF SW SCORES TO DETERMINE THE EFFECTIVENESS OF A MICROSATELLITE REPEAT FOR EXCLUSION ANALYSIS OF CANDIDATE DISEASE GENES
Katelyn Bagg
Category: Cell Biology, Genetics and Genomics, Section 4
Poster #: 94
Location: Ballroom, 1:30 PM - 3:30 PM
Mentor(s): Patrick Venta (Microbiology and Molecular Genetics)

Our lab has developed a method to predict heterozygosities for tetranucleotide simple tandem repeats (tetraSTRs; aka microsatellites) from a simple reference genome using SW scores obtained from the UCSC genome browser. This method is useful for identifying tetraSTRs near candidate disease genes to determine if they are culprit or innocent genes by a process we call exclusion analysis. However, several things are unknown about the best way to use tetraSTRs. One is whether it is more useful to use tetraSTRs that have larger SW scores despite having higher mutation rates for exclusion analysis. Also, the allele size range (bin) versus SW score has not been explored. Further, it would be useful to know if SW scores could be used to predict heterozygosities for nonsequenced genomes. We examined these questions using the following methods. A canine genotyping dataset from Irion et al. was used to estimate bin range versus SW score and “effective heterozygosities” (based upon one-step and two-step mutational models), using Excel spreadsheets. A fox genotyping dataset from Kukova et al. was used to determine the relationship between dog SW scores and fox heterozygosity. We show that higher SW scores provide greater power to exclude candidate genes and that the bin range scales upwardly with increasing SW score ($y=0.13x+0.76$; $r^2=0.31$). Finally, we show that SW scores from one species are only marginally useful for predicting heterozygosities in a distantly related species, although we speculate that the prediction of heterozygosity may be more useful for more closely related species.

ADAPTATION OF SACCHAROMYCES CEREVISIAE
Sivakumar Nallasivam
Category: Cell Biology, Genetics and Genomics, Section 4
Poster #: 95
Location: Ballroom, 1:30 PM - 3:30 PM
Mentor(s): Barry Williams (Zoology, Microbiology and Molecular Genetics)

Saccharomyces cerevisiae (yeast) is a widely studied model organism that has been utilized to address medically relevant issues. This research project has dealt with determining the effects of genetic variation and competition in strains of S. cerevisiae on rates of adaptation and pathogenicity. This project is a long-term evolution experiment that consists of exposing four natural oak, vineyard, and clinical isolates of S. cerevisiae to three complex, stressful, clinically relevant environments over an extended period of time. After that period we will have cultures of yeast that have potentially adapted to their "new" environment, with which we will determine the degree of adaptation by comparisons with the ancestors that initiated the experiment. Fitness effects of mutations will be determined across the different environments in order to identify potential trade-offs in selection pressures. We will then determine and validate the changes at the genetic and subsequently at the phenotypic level that have occurred in the cells that have allowed them to continue to survive in their respective environments. If these mutations are at locations in the genome unrelated to previously identified causative locations involved in natural adaptation in pathogenic isolates of yeast, we can examine if any unique trade-offs in adaptation existed in our experiment that allowed for new directions of evolutionary change. If these are determined to be trade-offs for traits underlying increased human pathogenicity, we can potentially identify new therapeutic targets for treatment of fungal infections.

TRANSCRIPTIONAL INHIBITION OF AP-1 USING TAM-67 IN MDA-231 AND MCF-7 CELL LINES
Brooke Pallas
Category: Cell Biology, Genetics and Genomics, Section 4
Poster #: 96
Location: Ballroom, 1:30 PM - 3:30 PM
Mentor(s): Michele Fluck (Microbiology and Molecular Genetics)

Activator protein (AP-1) functions as a primary transcription factor during the initiation of cellular transcription. A dimeric protein, the AP-1 complex is made up of two subunits, Fos and Jun. Both proteins possess a DNA and protein binding domain, as well as a transactivation site which work cohesively to decharge the DNA, and loosen its tight association with the nucleosome in order to allow for transcription to begin. My research focuses on the introduction of the engineered plasmid, Trans-Activation Mutant (TAM 67), which contains the gene for a mutated Jun protein as well as for eukaryotic antibiotic resistance. Infection via a retrovirus vector into two separate cell lines was then performed. The MDA-231 cell line, established from a metastatic breast cancer tumor, and the MCF-7 cell line, originally isolated from a non-metastatic tumor were both exposed to virus and successfully infected cells were then reisolated by puromycin treatment. The research objective is to observe the phenotypic variation of colony development between infected and uninfected communities of both cell lines, as well as test mutant cells ability to survive while suspended in gelatin agar. My findings should show that the production of the dominant-negative mutated Jun protein should out-compete the transcriptional creation of wild-type Jun, which is heavily prevalent within cancer cells. In effect, this alteration should produce an inability of the cell to retain its cancer like qualities and essentially revert the cellular functions to remain similar to those of non-cancergenic cells.

Communication Arts and Sciences

Oral Presentations

THE APTITUDE OF YOUTUBE IN THE DELIVERANCE OF SCIENCE
Heather Hartmann, Jeremy Shinn, Nick Somoski
Category: Communications Arts and Sciences, Section 1
Location: Green Room, 9:00 AM
Mentor(s): Danita Brandt (Geological Science)

Science has long since struggled for dominancy in the media, a communication barrier between scientists and the general public existing throughout the years. However, with new technology, especially in the form of social media, science now has a way to become more generalized. This interesting problem has led our group to find an outlet through which science (presented in a colloquial form) can be most-widely publicized. Our research is a part of a larger group that is assessing the efficiency of communicating science topics through a number of on-line forums including blogs, Twitter and Facebook. However, YouTube leads the pack of social media wolves because of its outstanding statistics and creative form of circulating information. It is the 3rd most visited website in the world, the 2nd largest online search engine, and the world's largest video sharing outlet. Our research has consisted of viewing the most popular science videos (determined by views, "Likes," and comments) and analyzing them. We've compiled a list of qualities that constitute a successful science video, as opposed to qualities that mold an unsuccessful one. Our presentation will display our findings and expose our perception of a popular, educational science video. The overall analysis will find a way to make science more mainstream, not only for the general public, but also for individuals seeking a popular form of science education.

TO INFORM & ENGAGE
Josh Michels, Ryan Groendyk, Ryan Sundberg
Category: Communications Arts and Sciences, Section 2
Location: Green Room, 9:15 AM
Mentor(s): Bob Albers (Telecommunication, Information Studies, and Media)

Promotional materials can, more often than not, simply be another gimmick to raise funds and increase awareness about specific programs. Taking all the best aspects from the College of Communication Arts & Sciences, we took on the challenge of seeing how one could best create a video that is targeted at creative minds. We set out to tell a story and present facts in an unconventional manner that both informs and entertains.

THE INSIDE SCOOP ON COLOR COMMENTATORS
Draymond Green
Category: Communications Arts and Sciences, Section 1
Location: Green Room, 9:30 AM
Mentor(s): Sandi Smith (Communication)

Objective: To learn more about the profession of college basketball color commentating from the perspective of professionals on the job now. Methods: Background information was obtained from reading books on Dick Vitale, the most well-known color commentator today, and on ESPN, the largest and most powerful television network that broadcasts sports programming. A web survey of current college basketball color commentators was created. IRB approval was obtained and the web survey was programmed. The main topics in the questionnaire are driven by my research questions. The first area of interest is the commentators' background with the game of basketball. Previous research notes that most basketball color commentators were college and pro basketball players or coaches. Therefore, questions about that are included. The second general area of the questionnaire concerns career initiation and includes questions about how the participant got into the career and whether or not the commentator had a mentor who helped them initiate their career. Third, questions about the day to day aspects of the career are asked, which include what the commentator likes and dislikes about the job and the travel and preparation that is necessary. Fourth, the communication aspects of the job are probed such as what the commentator does to make the broadcast more enjoyable for the audience. As the research is ongoing at present, Results and Conclusions are yet to be determined.

ROLLER SKATES, BRUISES AND LIPSTICK: FEMININE AND MASCULINE DISPLAYS WITH ROLLER DERBY
Erin vonKronenberger
Category: Communications Arts and Sciences, Section 1
Location: Green Room, 9:45 AM
Mentor(s): Theresa Winge (Apparel and Textiles)

During the last two decades, Roller Derby in North America has experienced renewed popularity, both with its athletes and fans. Roller Derby is an aggressive contact sport on roller skates around a flat or banked track, featuring female athletes dressed in provocative and hyper-feminine uniforms. A superficial read of Roller Derby suggests numerous similarities to male-dominated sports; however, upon closer examination it reveals unique feminine practices and compensations, such as "hosting" the visiting team and "taking a knee" when someone is injured during play on the track. Still, this sport provides its athletes with agency and power not often afforded women. Accordingly, the athletes rename themselves with humorous yet powerful and often highly sexualized names, such as Anita Punch and Charmed 'n' Dangerous. In this paper, I discuss how female athletes explore feminine and masculine identities within the sport of Roller Derby from my ethnographic research with teams in North America. Specifically, I explore the ways that Roller Derby athletic dress/uniforms express hyper-feminine identities (or fantasies), while the sport encourages and allows behaviors both on and off the track more often associated with male athletes, such as swearing, verbal taunts, spitting, and fights. I analyze in depth the Roller Derby uniforms (and the sport's related dress), which are rich with non-verbal communication about the athletes displayed identities; their relationships with team mates, opposing teams, and fans; and socio-political positions of the athletes (and fans).

GRUMPY SNOWMEN: DELUXE EDITION
William Jeffery, Eric Musser, Daniel Sosnowski
Category: Communications Arts and Sciences, Section 1
Location: Green Room, 10:00 AM
Mentor(s): Brian Winn (Telecom)

Grumpy Snowmen was made as a holiday game for alumni, faculty, staff, students, and friends of the College of Communication Arts & Sciences at Michigan State University. In the game, rival big ten schools have setup snowforts across MSU campus, populating them with grumpy snowmen. The player controls Sparty in an effort to remove the grumpy snowmen in a whimsical fashion. The game parodies the now classic artillery-style gameplay featured in Angry Birds.

FOCAL POINT
Katie Masters, Lindsey Gordon, Amber McDonald
Category: Communications Arts and Sciences, Section 1
Location: Green Room, 10:15 AM
Mentor(s): Bob Gould (Journalism)

Focal Point serves Michigan State University as the only on-campus news broadcast. As a production team, we aim to direct our students through the ins and outs of a television newscast. Our students find their own stories, write scripts, shoot their stories, edit, produce and publish their stories to the web. We also have a control room crew completely run by students. Students can come to our live-to-tape tapings and learn how to produce and tape a newscast. We aim to give students an opportunity to learn all about broadcast journalism and we aim to teach them what goes into a newscast from brainstorming to final production, we aim to provide real-world experience in a student setting of what it takes to create a newscast. As a production team, we have benefited from this experience, learning what it takes to produce a student newscast. We serve the East Lansing and Lansing communities as well, airing on WKAR-TV, to provide the communities with updates on campus news and other news.

SUPPLIER SELECTION AND DEVELOPMENT BASED ON MANUFACTURING COMPANIES
Anupama Sridaran
Category: Communications Arts and Sciences, Section 1
Location: Green Room, 10:30 AM
Mentor(s): Tobias Schoenherr (Supply Chain Management)

Supplier selection and supplier development are both very important components of the purchasing process. The target focus of the process was based on manufacturing companies in the East Lansing/ Lansing Michigan area and how companies chose a prospective supplier base and develop a strong selection criteria. Through library and literature review research, I gained knowledge on various supplier selection criteria factors including price, quality, delivery, and flexibility. Buying firms can also engage in a variety of supplier development activities in order to increase the perceptions of buyer-supplier relationships and supplier performance. Proper supplier evaluation and feedback is extremely vital to enhancing a buyer's purchasing performance and the overall performance of the business. Clearly defined supplier selection criteria aids a buying firm to identify vendors that can provide substantial product quality, performance, flexibility, and on time deliveries. Overall, supplier involvement is a critical success factor for the buying firm and directs results in increases in purchasing performance.

THE PROMINENCE OF TECHNOLOGY CHANGING INDIVIDUAL INTERACTION IN SOCIETY TO ENCOURAGE SOCIAL NEGATIVITY INCREASING A HIGHER DEMAND OF NUANCES IN INFORMATION
Candace Eason
Category: Communications Arts and Sciences, Section 1
Location: Green Room, 10:45 AM
Mentor(s): Britta Urness (Art History)

Since life has evolved with technology it has shaped the traditional methods of communicating. Due to technology shifting communication from formal to basic, our interactions are remotely transforming drastically. As long as technology advanced, there has been negativity associated. Indeed, the techniques of shaping tools are accepted as evidence of the beginning human culture. On the whole, technology has been a powerful force in the development of civilization; all the more it has an ability to exude negative activity. (Rutherford, James. The Nature of Technology: Science for All Americans.1989, 1990.) In today's world, technology is a complex social enterprise that allows promotional engagements of self-identity, marketing, and manufacturing goods. For instance, Facebook allows you to solicit, as much information as you like. But what happens when all information is negative and affects you personally? The negative side effects of the Internet has primarily become over accessing by the advertisement of commercials. Which later results in dependency, alienation, and perhaps anti-social behavior. Considering that the average person watches television for a mere four hours per day, the chances are that the individual is also multi-tasking and utilizing the Internet as well. (Decker, Rick. Computer Science: Applications and Implications, class notes. Sept. 28, 2000.)One certainty is that the Internet is here to remain and humans will continue to adapt and reinforce its negative connotations. My objective is to research the negative aspects of the Internet revealing the reason that PIPA and SOPA may be accurate propositions against regulating Internet's vulgar nature.

FILIPINA NURSES
Alex Barhorst, Elizabeth LeCrone, Andrea Raby, Simon Zagata
Category: Communications Arts and Sciences, Section 2
Location: Green Room, 1:00 PM
Mentor(s): Geri Zeldes (Journalism)

Our goal for this project is to investigate the prosecution of two Filipina nurses who were charged in the mid-1970s with poisoning patients in the Veterans Administration Hospital of hospital residents in Ann Arbor. The nurses were prosecuted on what the judge considered "circumstantial evidence." Our group's goal is to delve deeper into the issue, focusing on the racial implications of the case, the results and impact of the FBI investigations into the case, and the power the media had on framing the issue for the public. Our team will be researching the topic in multiple ways. From reading novels covering the topic to scouring thousands of pages of FBI reports on the case, to searching through microfilm for newspaper coverage of the story, we plan to expand our understanding of the case. We plan to also probe the political and socio-economic contexts of the 1970's in which they lived and the implications it had on their case. Regarding our presentation, we plan on combining an oral presentation, personally sharing the results of our findings and communicating what we've learned, with a visual representation of our studies, using multimedia programs to display the results of our studies in an optically appealing manner.

THRIVE WITH LESS
Josh Michels, Maureen Hnatiuk, Colin Marshall, Jaclyn McNeal, Ryan McPhail, Matt Radick
Category: Communications Arts and Sciences, Section 2
Location: Green Room, 1:15 PM
Mentor(s): Bob Albers (Telecommunication, Information Studies, and Media)

What in your life brings you true joy? Is it the amount of clothes in your closet? The number of friends you have on Facebook? The value of the car you drive? Or is it the time you spend with your friends and family – making art, sharing stories, or simply enjoying each other's company? We believe that by transitioning away from an excessive, materialistic lifestyle, one is better suited to cultivate and embrace the ideas of true community. Rather than focusing on social status or personal wealth, we hope to reconnect in a more intimate way. To better understand this alternative lifestyle, we are challenging ourselves to look inward and remove the excess from our lives. As we explore a more moderate way of life, we are creating a documentary that exemplifies how it can be attained for all. Not only will we document our own journey, but we will also explore the lives of individuals who embody a more minimal existence. Furthermore, we are asking our audience to participate in the challenges and the production process by connecting through social media and community events. Through our research, we hope to make and inspire changes that will benefit us personally as well as the larger community. By shifting our mindset, we believe we can create real, positive change in our society. www.ThriveWithLess.com

868 CHINA PROJECT
Shuyi Meng
Category: Communications Arts and Sciences, Section 2
Location: Green Room, 1:30 PM
Mentor(s): Geri Zeldes (Journalism)

"868 China" is a project that aims to produce a half hour documentary that tells the story of Chinese students in the U.S. The storyline of this film follows five MSU Chinese undergraduate students, recording their behaviors and daily life, thereafter examining how American culture shapes Chinese students' behavior and their way of viewing the world. It aims to reveal the communication problems between people and culture. Even though it is based on MSU and the East Lansing community, it provide a scope for audiences to think about some substantial issues that happen between different races and different people from various backgrounds. Even though this project is based on interviews of five Chinese students, it projects the economic, cultural and social relationships between China and the U.S. This project started in Fall of 2011 and received $40,000 in funding for preproduction, production, and postproduction. "868" refers to the number of Chinese freshmen that came to MSU in Fall of 2011. My job in this film is filming and editing and graphic design. I will film several interviewees of their daily lives, and will edit the film clips. I can also design the poster and cover for this documentary to help with promotion. I think it is a very important chance to show American what Chinese, and China, really is, and to eliminate the negative stereotypes. Further, it can help with the problems and misunderstanding that exist between the people from variety of backgrounds.

UNDERSTANDING A GROWING GLOBALIZED MARKET AND THE RESULTS OF PHYSICAL AND VIRTUAL SPENDING
Mike Green, Alex Dawson, Olivia Hacker, Yui-tak Wan
Category: Communications Arts and Sciences, Section 2
Location: Green Room, 1:45 PM
Mentor(s): Bob Albers (Telecommunication, Information Studies, and Media), Swarnaval Pillai (Telecommunication, Information Studies, and Media)

We are documenting several ways in which virtual shopping and brick mortar shopping have changed in the past, present, and the potential changes for the future. While trying to take a consumer based approach, our group is hoping to better understand the ways in which different spending habits among generations has forced this change. In addition we are hypothesizing that the younger generations of spenders will eventually allow virtual shopping to take over physical shopping and eliminate the need for coexistence. Our interviews with various knowledgeable researchers, as well as businesses and the consumers themselves will hopefully give us the insight we are looking for.

THE CASE OF THE TORCHED TURF
Troy Hinds, Kale Davidoff, Annette Gianino, Taylor Normington
Category: Communications Arts and Sciences, Section 2
Location: Green Room, 2:00 PM
Mentor(s): Bob Albers (Telecommunication, Information Studies, and Media), Jeff Wray (English)

We will be presenting excerpts from, and discussing, our film, "The Case of the Torched Turf" which we have been working on in conjunction with our Fiction Film Specialization curriculum. The Fiction Film Specialization is a joint effort by the college of Arts and Letters and the college of Communication Arts and Sciences to create a dedicated program focused specifically on film.

TRADITIONAL VS. SOCIAL NETWORKING ROUTES FOR ORGAN DONATION REGISTRATIONS IN A COMPETITION-BASED CAM
Rebecca Gidley
Category: Communications Arts and Sciences, Section 2
Location: Green Room, 2:15 PM
Mentor(s): Sandi Smith (Communication)

Nearly 3,000 Michigan residents are waiting for an organ donation; however, Michigan ranks as the sixth lowest state for registered organ donors. To increase enrollment, the Health Resources and Services Administration provided grant funding for the addition of a social networking component to enhance the existing university competition-based campaigns run by Gift of Life Michigan. These campaigns play off the long standing rivalry between the University of Michigan and the Ohio State University. There were two routes to reach the organ donation registration webpage: via Facebook social networking or by direct visits to the URL. The social networking route could be taken from Facebook advertisements, Facebook fan pages, and widgets. Direct route visits occurred when people directly typed the organ donation signup address in an internet browser from reading the URL on traditional campaign materials. The routes people took to visit the organ donation registration webpage in these campaigns are important to determine, thus, this paper reports the relative effectiveness of traditional materials (i.e., print) vs. social networking routes (i.e., Facebook). Data from the Google Analytics web usage tracking system were used to determine whether visitors to the registration signup page clicked on a link to the signup page from a networking route or whether they visited the webpage directly. In the baseline year of the Wolverine-Buckeye Challenge, there were 224 signups, 451 in the second year, and 1756 in the third. There was no significant difference between the two sources for visits to the organ donation registration page.

MOLTEN LIGHT: THE INTERTWINED HISTORY OF STEEL AND PHOTOGRAPHY
Julie Mianecki, Alexandra Ghaly
Category: Communications Arts and Sciences, Section 2
Location: Green Room, 2:30 PM
Mentor(s): Howard Bossen (Journalism), Eric Freedman (Journalism)

Steel defined the industrial age, both as a material and a way of life for the workers who built the industrialized world. The birth, decline and re-birth of the industry has been chronicled by many talented photographers, and their work allows steel's prominence to live on though images. The planned exhibition, Molten Light: The Intertwined History of Steel and Photography, investigates the relationship between the simultaneous development of the steel industry and the development of photography. As the project has taken shape, our responsibilities have undergone a series of parallel transformations. While we were previously involved in database development, researching specific photographs and photographers, and grant applications, our team is currently transitioning to involvement in the shaping of the final exhibition. We are refining our research topics to include photographer access to steel mills and the censorship of their photographs by corporations that don't wish them to be seen; gathering and synthesizing the material found in years of Howard Bossen's photographer interviews; analyzing research conducted on the Monroe Steel strike and writing brief essays in preparation for scholarly articles; and editing a series of more than 90 photographer biographies. Ultimately, our goal is to help put a set of photographs into perspective for an audience, focusing especially on how steel photographers grappled with steel's relationship to social and political issues worldwide. Our presentation will discuss several of the diverse tasks we have been involved with as research assistants and how they have contributed to the project as a whole.

EVALUATING THE FUSION OF PROFESSIONAL ARTWORK AND FEAR APPEALS TO DECREASE TOBACCO USE AMONG COLLEGE-AGED ADULTS
Sarah Sheff
Category: Communications Arts and Sciences, Section 2
Location: Green Room, 2:45 PM
Mentor(s): Kami Silk (Communication)

Despite society's awareness of the health risks associated with tobacco use, college-aged adults are still a group at great risk for using various forms of tobacco. Using the Extended Parallel Process Model (Witte, 1992), a model that predicts how fear appeals are processed by individuals, this project tested the fusion of professional art photography of patient radiation masks and a written fear appeal narrative to prevent tobacco use. The sample consisted of 120 Michigan State University Students. Participants were exposed to one of three message conditions (photography only, narrative only, combined) or a control condition and then completed an online survey directly following exposure and then again two weeks later to assess message effectiveness and memorability. Dependent measures included perceptions of severity and susceptibility, emotional reaction, and behavioral intentions to seek additional information about mouth/throat cancer, reduce tobacco use, and share the message with family and friends. It is hypothesized that the combined condition will have the greatest impact on participant responses. Implications of these results for designing health messages will be presented.

Poster Presentations

MILLENNIAL MEN AND GROCERY SHOPPING
Mollie Dargan
Category: Communications Arts and Sciences, Section 1
Poster #: 100
Location: Gold Room, 9:30 AM - 11:30 AM
Mentor(s): Patricia Huddleston (Advertising, Public Relations, Retailing)

The purpose of this study is to find out what influences millennial men and their grocery shopping habits. There is not much information available about this topic. The study will examine college aged men and their individual grocery shopping habits. Specifically, we will be looking at what they purchase, what motivates them to purchase specific items, and if promotions (e.g. coupons, in-store displays) influence their purchasing decisions. We will compare the purchasing behaviors of college-aged men by lifestyle such as those who live on and off campus and those that have a car versus those that do not. The results of this study will inform marketing decisions and ways to market grocery items to millennial men. This study will use a qualitative approach by using face to face, semi-structured interviews with 20 college aged men. We will be asking questions concerning their typical grocery purchases, in-store and marketing influences, influence of peers and family on food purchases and brand preferences.

MILLENNIAL MEN AND GROCERY SHOPPING
Laura Schaffner
Category: Communications Arts and Sciences, Section 1
Poster #: 101
Location: Gold Room, 9:30 AM - 11:30 AM
Mentor(s): Patricia Huddleston (Advertising, Public Relations, Retaililng)

The purpose of this study is to examine how the millenial male's perception of his own health influences what he purchases at the grocery store. With obesity rates as high as 71.2% for men of all ages, we are interested to see what men believe are healthy decisions by looking at their purchasing behavior at the grocery store. We hypothesize that men do not express concern about healthy eating nor is healthy eating a driver of their grocery shopping habits. We also want to see if millenial men are influenced by in store shopper marketing techniques (e.g in-store samples and displays) and if so, what are the most influential? Qualitative research was used in the form of in-depth interviews to conduct our study. We asked men about their grocery shopping habits, brand preferences, food purchases and influence of shopper marketing techniques.

ROLE OF CONTEXT PITCH AND TIMING CUES IN WORD RECOGNITION IN SPANISH
Jessica Navarro
Category: Communications Arts and Sciences, Section 1
Poster #: 102
Location: Gold Room, 9:30 AM - 11:30 AM
Mentor(s): Laura Dilley (Communicative Sciences and Disorders)

Listeners have to use a combination of different acoustic cues in order to divide the continuous acoustic speech signal into words. Recent work has shown that word segmentation in the later part of an utterance is influenced by distal prosodic characteristics, meaning those pitch and timing patterns which occur at the beginning of an utterance (Dilley and McAuley, 2008). In previous experiments, whether or not listeners heard monosyllabic or disyllabic words in a lexically ambiguous sequence in English (such as footnote and bookworm or foot, notebook, and worm) was shown to depend on distal prosodic characteristics. The purpose of this study is to determine if these findings will extend to spoken Spanish. In Spanish, words ending in vowels will usually have stress on the penultimate syllable, and words ending in most consonants will exhibit stress in the final syllable. There are numerous minimal pairs that contrast only in their stress pattern; for example, “él jugo” means “the juice,” while “el jugó” means “he played.” Similar to Dilley and McAuley’s study, participants in the current experiment will listen to ambiguous sentences and report the last word they heard. If Spanish-speaking listeners use pitch and timing information in a similar way to English listeners, the context speech should influence their perception of which stress pattern is heard, and therefore, which word is perceived. The results will help further understanding of how listeners are able to divide the continuous acoustic speech signal into words, as well as on the generality of this process across languages.

DEVELOPING A BETTER SOLUTION FOR PATIENT INFORMATION OF PRESCRIPTION DRUGS
Doug Furgason
Category: Communications Arts and Sciences, Section 1
Poster #: 103
Location: Gold Room, 9:30 AM - 11:30 AM
Mentor(s): Laura Bix (Packaging)

As Americans in the 21st century we have been increasing our demand on the right to know pertinent information, especially in regard to our personal health. The FDA has made significant strides by standardizing the drug facts labeling of over the counter drugs but still lags in developing an adequate solution for the communication of information for prescription drugs. The aim of my research is to support the ongoing effort of the FDA to improve patient information of prescription drugs. By using the technology of an eye tracker, we will be tracking the eye movement of human subjects as they view proposed prototypes. Particularly of interest is the emphasis of a boxed warning which includes the most important information a patient should focus their attention to. We will be testing two hypotheses, that subjects will preferentially attend to a boxed warning and that the positioning of the box will have a noticeable effect on consumer perception. For this presentation, I will be reporting preliminary data acquired from studies on a population of students. It is our hope that with the findings of this study that we will be able to contribute to the mission of the FDA to provide patients with a better understanding of the drugs they are prescribed.

MACHINE VISION FOR A CHILD WITH SMA
Michelle Arthur, Hilary Halm, Natalie Simon, Christine Whitmer
Category: Communications Arts and Sciences, Section 1
Poster #: 104
Location: Gold Room, 9:30 AM - 11:30 AM
Mentor(s): John Eulenberg (Communicative Sciences and Disorders)

This is a case study about an augmentative communication intervention for a 5-year-old girl (CK) with Spinal Muscular Atrophy (SMA). SMA is a genetically carried motor neuron disease affecting muscles throughout the body, most severely affecting the shoulders, hips and back. Sensation and the ability to feel are not affected. Intellectual activity is normal. CK receives home-bound educational services from her local school district. Because of the weakness in her extremities, CK is not able to use a standard mouse or keyboard. The school district occupational therapist contacted the MSU Artificial Language Laboratory (MSU-ALL), Dept. of Communicative Sciences and Disorders, in order to see if technology might be developed to permit CK to participate in computer-based academic and creative activities. The student research team at the MSU-ALL adapted a machine vision application, Camera Mouse, for CK, repurposing a program originally designed for tracking a person’s head movement to

instead follow CK's hand movement. CK is too weak to hold up her hand, but her father built a plastic trapeze-like structure that holds CK's left arm on a flexible rubber strap. Using software developed at the MSU-ALL, CK is now able to control a cursor to move to any place on a computer monitor screen. She is also able to cause a cursor to dwell at any place on the screen, permitting clicking. CK now is able to draw and color original pictures and to work with programs to build literacy skills.

DESIGN OF A GESTURE LANGUAGE FOR NONSPEAKING PERSONS
Danielle Largent, Lauren Cibor, Kathryn Genoa, Lexie Johnson
Category: Communications Arts and Sciences, Section 1
Poster #: 105
Location: Gold Room, 9:30 AM - 11:30 AM
Mentor(s): John Eulenberg (Communicative Sciences and Disorders)

A new generation of AAC speech generating device is emerging, requiring no switches, touch panels or joy sticks for user control, but rather employing the recognition of gestures, i.e., patterns of movement of a body part, such as the head, arm, or leg. The heart of such a gesture recognition system is an acceleration-sensing device and a computer application which learns to recognize a set of distinct patterns. In this poster presentation, the development of such a system will be described, and a live demonstration of three such gesture systems will be presented.

VIDEO GAMING FOR PERSONS WITH PROFOUND MOTOR LIMITATIONS
Ashley Clark, Mallory Dewind, Claire Meconi, Kliman Samantha
Category: Communications Arts and Sciences, Section 1
Poster #: 106
Location: Gold Room, 9:30 AM - 11:30 AM
Mentor(s): John Eulenberg (Communicative Sciences and Disorders)

Persons who experience profound motoric limitations due to cerebral palsy, traumatic brain injury, stroke, or progressive neurological disorders are at a disadvantage in not being able to operate technology for communication and control. When standard controls such as keyboards, mice, touch screens and switches are not accessible, a person may be isolated from social interactions and educational and vocational opportunities. The MSU Artificial Language Lab (MSU-ALL), Department of Communicative Sciences and Disorders, has been developing a suite of interactive applications which allow users to develop subtle movements of muscle groups that would normally be ignored by standard control devices. Using infrared sensors and triaxial accelerometers, the MSU-ALL student research team has created personalized video games which not only provide the user with control over a virtual environment, but also give physical training to reinforce movements that can serve for voice-output communication systems and environmental controls. This poster presentation shows how these video games are being used at rehabilitation centers and schools in Michigan.

PITCH AND TIMING CHARACTERISTICS OF SPEECH DIRECTED TO INFANTS WITH AND WITHOUT COCHLEAR IMPLANTS
Emily Samarian
Category: Communications Arts and Sciences, Section 1
Poster #: 107
Location: Gold Room, 9:30 AM - 11:30 AM
Mentor(s): Laura Dilley (Communicative Sciences and Disorders)

The musical properties (i.e., prosody) of maternal speech, such as syllable rhythm and pitch, have been shown to differ between infant-directed (ID) and adult-directed (AD) speech (Fernald & Mazzie, 1991). Although prosodic differences between ID and AD speech have been studied in depth with ID speech to normal-hearing children, little is known regarding speech directed to infants with cochlear implants. This study examined prosodic variation in mothers' speech directed to their children with cochlear implants and how it differs from that of mothers' speech to their normal-hearing children. Mothers were recorded either reading a children's storybook to their normal-hearing (NH) or cochlear-implanted (CI) infant (ID condition), and to an adult experimenter (AD condition). Participants in the CI condition were recorded both prior to and after implantation and were then matched to NH participants based on chronological age and hearing age (i.e., amount of post-natal hearing experience). Mothers spoke to their child with a hearing age of 3-, 6-, and 12 months. Our analysis used a speech labeling system to look at the use of prominent syllables and distinct tonal changes to determine if ID speech characteristics remained the same between: mothers with NH and CI infants, mothers with CI infants before and after implantation, and mothers with CI

infants over various periods of time after implantation. This study will provide information regarding what speech characteristics mothers use with their CI infant and may have future clinical implications.

ORGANIZATIONAL SOCIAL MEDIA: A COMPREHENSIVE FRAMEWORK AND RESEARCH AGENDA
Krista Wiegand
Category: Communications Arts and Sciences, Section 1
Poster #: 108
Location: Gold Room, 9:30 AM - 11:30 AM
Mentor(s): Wietske Van Osch (Telecommunication, Information Studies, and Media)

Drawing on Habermas' theory of communicative action, this article proposes the Organizational Social Media Lifeworld (OSML) as a useful model for disentangling the potential role of social media in organizational communication. The OSML model provides a rich contextual view of organizational communicative action as enacted by organizational actors pursuing a variety of goals and embedded in a structural entity encompassing schemes, rules and resources as well as a cultural context encompassing artifacts, values, and assumptions. Based on the OSML model, we show how social media are intrinsic to each of the four elements—actors, action, entity and culture—and the two foundational processes of structuration and socialization that connect these four elements. In order to illustrate the usefulness of the OSML model, we provide seven illustrative vignettes of the use of Facebook Pages for organizational communication. Finally, we provide implications and directions for future organizational social media research and development.

CHILDHOOD FANTASY DREAM
Yifan Liu
Category: Communications Arts and Sciences, Section 1
Poster #: 109
Location: Gold Room, 9:30 AM - 11:30 AM
Mentor(s): Alison Dobbins (Theatre)

There is a spectrum of engagement of media ranging from passive to active. At the most passive level, the audience is just receiving messages and information from the media, there is a little or no response from them. At the most active level the audience decisions and actions change the media. The purpose of my project is to create active media to make a theatrical audience engaged in, not only receiving information passively, but also involved in a performance. Their movement and voice will control the media and the media will respond. This form of active engagement goes both ways and I hypothesize that the active media will also cause a reaction in the audience.

MOVEMENT COORDINATION OF SPEECH ARTICULATORS DURING A NOVEL SPEECH LEARNING TASK DIFFER BETWEEN ADULTS WHO DO AND DO NOT STUTTER: AN ELECTROMAGNETIC ARTICULOGRAPH STUDY
Kelly Lennon
Category: Communications Arts and Sciences, Section 2
Poster #: 110
Location: Gold Room, 1:30 PM - 3:30 PM
Mentor(s): Soo-Eun Chang (Communicative Sciences and Disorders)

Adults who stutter are more likely to exhibit decreased stability of their motor performance when the length and linguistic complexity of their utterances increase, compared to adults who do not stutter1,2. In this study we measured kinematic movement velocity and amplitude of speech articulators (lip, tongue, jaw) in the context of a speech motor learning task. We hypothesized that adults who stutter would have increased movement amplitude and reduced velocity as compared to fluent controls, and increased variability in speech articulator movement during speech learning. The kinematic data was acquired using an AG500 Electromagnetic Articulograph3,4. 16 stuttering and 14 controls participated in this study. Surgical glue was used to affix articulograph sensors onto the upper lip, tongue tip, and lower incisor (to track lower jaw movement). Additional electrodes were placed on the nasion and bilateral tragus points to monitor head movement. Each subject was then placed under the weak magnetic field of the 3D articulograph, which tracked movement of the electrodes. During the experiment, subjects learned to produce a novel pseudoword following aural presentation of the word in repeated trials. Results indicated that stuttering adults exhibited significantly increased movement variability in their speech articulators during speech learning even in the absence of stuttering. Movement velocity and amplitude of the tongue tip and jaw also differed from controls. These results suggest that stuttering adults have subtle differences in speech kinematics from controls, which may reflect deficiencies in sensorimotor integration that is needed for fluent speech production.

NEURAL BASES OF CHILDHOOD DEVELOPMENTAL STUTTERING
Kevin Brown
Category: Communications Arts and Sciences, Section 2
Poster #: 111
Location: Gold Room, 1:30 PM - 3:30 PM
Mentor(s): Soo-Eun Chang (Communicative Sciences and Disorders), David Zhu (Psychology)

After many decades of attributing stuttering to causes ranging from childhood trauma to overly anxious personalities, scientists have used neuroimaging techniques to reveal measurable differences in the brain activity of people who stutter versus fluent speakers. While researchers have been successful in understanding stuttering in adults, the neural basis of the disorder in children still remains a mystery. In this study, we report brain structural and functional MRI data from 20 stuttering children (range 3-9 years) and 16 control children (range 3-9 years). We acquired diffusion tensor imaging (DTI) data to examine white matter structure and resting state fMRI to examine patterns of correlated brain activity while the children rested with eyes closed. Subject-specific "seeds" in the left inferior frontal gyrus (IFG) derived from an fMRI study involving overt speech production were used to examine areas that had structural and functional connections with this speech planning area. Results showed that stuttering children had significantly decreased white matter tract density in the superior longitudinal fasciculus/arcuate fasciculus underlying the left inferior frontal region. Stuttering children also displayed significantly increased correlated activity with the left IFG in the basal ganglia (right putamen, caudate) during rest, yet significantly decreased activity in the right cerebellum. These results suggest that stuttering children have a structural deficiency focused in the left white matter tract that may affect efficient communication among speech planning and execution regions in the left hemisphere, which may play a role in aberrant functional connectivity between cortical speech planning areas and subcortical regions.

MARKETING NONFICTION: THE DEVELOPMENT OF A SUSTAINABLE ONLINE PRESENCE FOR FOURTH GENRE
Kimberly Tweedale, Katie Conley
Category: Communications Arts and Sciences, Section 2
Poster #: 112
Location: Gold Room, 1:30 PM - 3:30 PM
Mentor(s): Laura Julier (Writing, Rhetoric, and American Cultures)

Fourth Genre is a national literary nonfiction journal published through the Michigan State University Press. It has a small staff and provides internships to students looking to enter the publishing industry. Tasks and responsibilities change hands frequently because of the high turnover rate of student interns, and this journal has struggled to maintain a cohesive online presence. This project aims to create, promote, and maintain an online presence for Fourth Genre through the use of social media and its website that can be maintained by future members of the editorial team. To achieve this goal, we first completed secondary research to discover what other small-staffed journals were doing to promote themselves online and evaluated the feasibility of implementing these strategies for Fourth Genre. We then conducted primary research about the journal by meeting with and talking to the editor and editorial staff to determine the identity that Fourth Genre wants to project with its online presence. We then used this research to create and implement a communication strategy for the journal that can guide current and future Fourth Genre team members in their decisions about how to promote the journal online.

FACEBOOK: THE NEW FACE OF SCIENCE?
Anna Strong, Hunter Craig, Rose Curtis, Meyessa Mansour
Category: Communications Arts and Sciences, Section 2
Poster #: 113
Location: Gold Room, 1:30 PM - 3:30 PM
Mentor(s): Danita Brandt (Geological Sciences)

In today's world, newspapers and magazines are becoming obsolete and more people are turning to social media for information and entertainment. After research on scientific communication through surveying websites, students, adults, and consulting online media statistics, our group assessed the potential for the online networking hub, Facebook, as a scientific information source. 800 million active users are a part of Facebook (http://blogsession.co.uk), which makes sending out information to large groups of people very easy; however, we must determine how useful Facebook is as a science communication tool through the number of likes, affiliation with major companies, and number of groups networked with a certain science news group. There are a few problems with using Facebook to convey science information, but there are good aspects as well. We found that many groups that are associated with legitimate science organizations or figures, such as Bill Nye

or National Geographic, were the most credible in terms of relevancy of material, number of users subscribing, and frequency of science news posted.

WHAT CONSTITUTES SEXUAL CONSENT? AN EXPLORATION OF CONCEPTUALIZATIONS OF CONSENT AND ITS RELATIONSHIP TO GENDER, NARCISSISM AND RAPE MYTH ACCEPTANCE

Jacqueline Weber

Category: Communications Arts and Sciences, Section 2
Poster #: 114
Location: Gold Room, 1:30 PM - 3:30 PM
Mentor(s): Kelly Morrison (Communication)

Sexual assault is a pervasive problem on many college campuses. National survey data indicate that between 20 to 25% of college women report they have been the victim of completed or attempted rape while in college (Fisher, Cullen, & Turner, 2000). A multitude of factors contribute to this problem, and previous research has established linkages between narcissism, rape myth acceptance, gender roles and sexual assault (Bohner, Siebler & Schmelcher, 2010; Murnen, Wright & Kaluzny, 2002; Voller & Long, 2010). Often overlooked is individual understanding of consent for sexual intercourse. Indeed, previous research has called for further examination of how individuals conceptualize consent (Peterson & Muehlenhard, 2007) in order to better understand and prevent sexual assault. This research reports the results of a study that explored knowledge and understanding of consent for sexual intercourse, and its relationship to a variety of attitudinal issues. College students completed an anonymous online survey in which they were asked to describe their definitions of consent for sexual intercourse, as well as their attitudes and intentions regarding sexual consent, and their attitudes regarding gender roles, narcissism and rape myth acceptance. The open-ended data were coded by two independent coders. Several categories emerged from the data, including whether consent is: verbal, nonverbal, ambiguous, revocable, mutual, determined by intimacy, mental capacity, or physical or emotional coercion. Implications for enhancing sexual communication to facilitate sexual consent and reduce sexual assault are discussed.

HOOK-UPS, ONE-NIGHTERS AND BUDDIES - OH MY!: DEFINING CASUAL SEX ENCOUNTERS ON COLLEGE CAMPUSES

Lindsey Alberty, Austin Griffin

Category: Communications Arts and Sciences, Section 2
Poster #: 115
Location: Gold Room, 1:30 PM - 3:30 PM
Mentor(s): Kelly Morrison (Communication)

A variety of casual sex encounters are experienced by today's generation of college students; including hanging out, hooking up (Grello, Welsh, & Harper, 2006; Paul & Hayes, 2002) friends with benefits (Bisson & Levine, 2006; Hughes, Morrison, & Asada, 2005; Mongeau, Ramirez & Vorrell, 2003), and more traditional dating relationships. These encounters often are facilitated by social networking sites (i.e., Facebook), occur in settings that are influenced by alcohol consumption, and in a culture where sexually transmitted diseases are considered a major challenge to public health (CDC, 2007). This research reports the results of a study that explored the descriptions, perceptions and attitudes of college students regarding casual sex encounters. Three hundred and thirty three college students completed an anonymous online survey in which they described a recent casual sex encounter; such as a hook-up, friends with benefits, or one-night stand type of relationship. Additionally, the participants completed several other scales assessing their attitudes about love, attitudes about sex, uncertainty, expectancy violations, and perceived costs and rewards associated with the encounter. Nine central themes emerged from the open-ended data, including: how they met, their relationship status with the other person, whether they defined the relationship, their motivations for the encounter, their sexual activity, their emotional involvement, the frequency of encounters, and the outcomes of the encounter. Recommendations for future research targeted at understanding the nuances of college casual sex encounters are discussed.

THE SCIENCE OF BLOGGING: BEST PRACTICES IN SCIENCE COMMUNICATION
Sarah Smaga, Agnieszka Felczak, Emily Kolean, Rachael LeFevre
Category: Communications Arts and Sciences, Section 2
Poster #: 116
Location: Gold Room, 1:30 PM - 3:30 PM
Mentor(s): Danita Brandt (Geological Sciences)

One of the largest challenges for scientists is communicating the rapidly changing body of knowledge to the general public. Effective communication is essential to the modern scientist to secure funding and collaborate with others in various fields. Exposing citizens to scientific thinking provides individuals with a framework for analysis of new ideas, while also creating more informed members of society with healthier lifestyles. Scientific communication occurs through a multitude of channels; however, the Internet presents a unique opportunity for two reasons: ease of publishing and frequent updates. These allow anyone to publish about recent advances in science, even editing or revising where appropriate. This research project sought to identify best practices in science blogging through a survey of existing blogs and websites, then synthesized these results to create a science blog, "Snack on Science." The initial survey revealed that someone using the Internet for science tended to be older than a general website user, and likely had a college degree. The new blog was publicized, mainly to college students, and readers were surveyed. The survey confirmed that the majority of readers were under the age of 34, and also had some college education. It also revealed that most readers chose blogs based on content rather than appearance or popularity, and that both articles and images are appealing content. The blog remains active, is regularly updated, and has reached almost one thousand individuals.

A SCIENTOMETRIC STUDY OF SOCIAL MEDIA RESEARCH
Evan Austin, Zach Averill, Michael Darnell, Jiaji Qian, Kurt Trowbridge, Ryan Wrench
Category: Communications Arts and Sciences, Section 2
Poster #: 117
Location: Gold Room, 1:30 PM - 3:30 PM
Mentor(s): Constantinos Coursaris (Telecommunication, Information Studies and Media)

The purpose of this study is to conduct a meta-review analysis of available social media literature. A review of relevant research published in academic journals since 2005 was performed that pertained to social media; this was achieved by keyword search of terms pertaining to the domain resulting in 525 relevant peer-reviewed, published journal articles. The poster will report on the citation analysis of authors, institutions, and countries involved in the authorship of social media literature, as well as the foundation publications of greatest impact to date. The review also investigates what methods, theories, and constructs are present in the literatures and how frequently they are used. The results show the leading individuals and institutions in the emerging field of social media research and how said research is being conducted.

AN INTERACTIVE EXPERIENCE
Sarah Shefferly
Category: Communications Arts and Sciences, Section 2
Poster #: 118
Location: Gold Room, 1:30 PM - 3:30 PM
Mentor(s): Alison Dobbins (Theatre)

Engaging oneself in the art of media is a unique experience. Interactive media can make that experience happen. What my research initiates is the process of allowing user interactivity. I can use programs such as Isadora, Maxmsp, and other interactive devices, i.e. the Wii sensor controller, to do this. The main objective is to engage the observer with the art of media. With this project the audience also becomes the actor, thus accomplishing the overall goal. Interactive media is important because of the engaging elements it carries. When your audience is engaged, it makes it easier to sell your thoughts, ideas, product, etc, and it helps generate a relationship with your audience, too. These are both important aspects of the media world. Interactive media is rising up within the world of media and, soon enough, it will be used by all.

OUTMUSCLE THE MIGHTY MINOTAUR!
William Ratledge
Category: Communications Arts and Sciences, Section 2
Poster #: 119
Location: Gold Room, 1:30 PM - 3:30 PM
Mentor(s): Alison Dobbins (Theatre)

This experiment incorporated elements of Greek mythology, video game conceptualization, group interaction tendencies, and the interplay of individual experience and imagination in an attempt to discover how people interact in an "active" environment to solve a problem. The experiment was also designed to learn what elements of individual personality and media interaction combine to make an individual experience a story and influence its outcome rather than merely observe it passively, and also to ascertain the means by which audience members communicate with one another in order to produce a "shared" experience. The task assigned was to defeat the Greek mythological Minotaur, the half man-half bull son of Minos, the king of Crete. An environment was simulated, placing the audience within the beast's labyrinth and observing their behavior when the Minotaur "attacked". The labyrinth was rigged to emit light and sound cues to alert audience members of their progress. Audience members exchanged light and darkness with the Minotaur in this exercise. Group interaction was encouraged by making the Minotaur "immune" to audience member attacks unless all were within a previously defined but undisclosed area. Sensors noted when one or more audience members left the defined area and triggered visual and audio cues that alerted the audience members of their inability to "harm" the Minotaur. Group success was measured by assessing the amount of time it took a particular group to successfully "slay" the Minotaur.

Digital Media

Oral Presentations

CLIMBING OLYMPUS: THE CHALLENGES OF DEVELOPING A MOTION CONTROLLED GAME
Jonathan Moore
Category: Digital Media, Section 1
Location: Lake Erie Room, 9:00 AM
Mentor(s): Brian Winn (Telecommunication)

In the Fall of 2010, the Games for Entertainment and Learning Lab began development of Olympus, a video game designed to create an immersive entertainment experience that also stimulates exercise with familiar video game hardware: a Wii motion controller and a dance pad. The design and development of such a project was faced with many struggles, and the creation of the user input for the game required numerous revisions. The final product of Olympus featured 4 hours of core gameplay, an impressive scope for a project developed almost entirely by undergraduate students. It is to date the largest game development project ever undertaken by the GEL Lab, with its development spanning two years. This talk will discuss some of the problems with engineering the core systems for the game, and the solutions that were arrived upon. It will also consider potential improvements to future projects based on the lessons learned and newer hardware that has appeared since then.

ACHERON
Andrew Zeko, Zachary Hall
Category: Digital Media, Section 1
Location: Lake Erie Room, 9:15 AM
Mentor(s): Amol Pavangadkar (Telecommunication, Information Studies, and Media)

Acheron is a short student film written and directed by Kris Sundberg and crewed by a student group for they final project in their capstone TC 442 class. This is the graduate project for 4 of the 6 students, and the culmination of their schooling.

PART-TIME KILLER
Ben Owen, Brittany Bryan, Ethan Pollard
Category: Digital Media, Section 1
Location: Lake Erie Room, 9:30 AM
Mentor(s): Amol Pavangadkar (Telecommunication, Information Studies, and Media)

A short film/mockumentary about a contract killer, Kyle Green. Our camera crew follows the daily life of his "different" way of life.

THE EXPENSE OF LEARNING: A DOCUMENTARY ABOUT THE RISING COST OF A COLLEGE EDUCATION
Christina Strong, Victor Lord, Jacquelyn Panetta
Category: Digital Media, Section 1
Location: Lake Erie Room, 9:45 AM
Mentor(s): Lisa Whiting-Dobson (Telecommunication, Information Studies, and Media)

The Expense of Learning: a documentary about the rising cost of a college education, is a film highlighting the difficulties and struggles of college students in Michigan as they face growing college expenses. Legislators in Michigan and in the country are cutting funding to education yet the cost keeps increasing. The support for education in dollars is not keeping up with inflation, this is problematic. The rising cost of college tuition is pricing the middle class and lower classes out of a college education which based on research is the key to a more successful future financially. The creation of college was meant to educate the masses. It was meant for people who could not afford private tutors and such but with the current trend college may become something only for the elitist and those who manage to win thousands and thousands of dollars in scholarships. This documentary is for the general public and for legislators spreading the message about this issue and hopefully sending a wake-up call to legislators. We are giving a voice to students and letting the public know about an important issue.

EPIC MUSIC BATTLE
Kelly O'Sullivan, Kale Davidoff, Danny Gianino
Category: Digital Media, Section 1
Location: Lake Erie Room, 10:00 AM
Mentor(s): Amol Pavangadkar (Telecommunication, Information Studies, and Media)

A music video showcasing a clash between electronic music and more traditional rock 'n roll. The video was shot in one night, which then was followed with an extensive post-production period. The music, video, and special effects were all composed/shot/edited by the production team of: Kale Davidoff, Danny Gianino, TJ Martinez, and Kelly O'Sullivan.

HENRY BRIMMER'S "TOUCH WOOD" AT ARTPRIZE 2011
Michael Daniels
Category: Digital Media, Section 1
Location: Lake Erie Room, 10:15 AM
Mentor(s): Henry Brimmer (Advertising, Public Relations, Retailing)

ArtPrize is a radically open competition open to any artist in the world who can find space in Grand Rapids, Michigan. Winners are selected by popular vote. While its possible for anybody to take part, there are only a few prestigious venues willing to give space to the artists they truly believe have something to share. Henry Brimmer, a professor in the college of Communication Arts & Sciences at Michigan State University, was one of 32 selected out of the 1900+ artists to have their creative work displayed inside The Grand Rapids Art Museum during ArtPrize 2011. His work, titled “Touch Wood”, was a huge success attracting thousands of people. This short documentary gives a glimpse of the struggles, successes, and surprises of Henry’s wonderful experience.

NARCISO, PEREZ AND THE PRESS
Stephen Taruc
Category: Digital Media, Section 1
Location: Lake Erie Room, 10:30 AM
Mentor(s): Geri Zeldes (Journalism)

The “U.S. v. Narciso-Perez & the Press” is a documentary film and research project that is investigating press coverage and reconstructing the trial in the 1970s involving two Filipina nurses – Filipina Narciso and Leonora Perez. During a six-week period in the summer of 1975, 27 patients experienced respiratory failure at the Veteran’s Administration Hospital in Ann Arbor. Eleven of those patients died, as reported by Time magazine. In June 1976, after an intense FBI investigation involving some 200 agents and costing more than $1 million, Narciso and Perez, who worked in the intensive care unit at the hospital where most of these patients were being treated, were charged with injecting the patients with the muscle relaxant Pavulon. The jury found the nurses guilty of conspiracy to poison three patients. In February 1977, a new federal judge overturned the verdict and dismissed the case on appeal, citing prosecutorial misconduct. Although given the opportunity, the prosecutor in the lower court decided not to re-try the case. While the case itself is about two women’s struggle, it is also about macro issues involving social justice, anti-immigration and transnationalism. Subsequent to the guilty verdict, University of Michigan students and Ann Arbor residents staged rallies in support of the nurses’ innocence and abroad, the case rallied many in the Philippines, including Pacifico Marcos, president of the Philippine Medical Association and brother of then President Ferdinand Marcos. Presented will be a short clip weaving interviews, archival video and photos.

MISSING MOON ROCKS
Colin Marshall
Category: Digital Media, Section 1
Location: Lake Erie Room, 10:45 AM
Mentor(s): Troy Hale (Telecommunication, Information Studies, and Media)

Of the 270 moon rocks given to states and nations of the world, more than half have gone missing. Whether destroyed or lost through carelessness or nefarious acts, at one time 180 moon rocks were unaccounted for. Former NASA special investigator Joseph Gutheinz has been studying this problem for over a decade and leads a team attempting to understand what happened to the missing rocks. Gutheinz, former NASA senior special investigator, now teaches criminal justice at Alvin Community College and the University of Phoenix. The only Special Agent to earn the NASA Exceptional Service Medal, recipient of the

President's Council on Integrity and Efficiency Career Achievement Award, Gutheinz has earned honors from six federal agencies and one state. Gutheinz was part of Operation Lunar Eclipse, which eventually recovered the Honduras Apollo 17 Goodwill Moon Rock. It was the first law enforcement recovery of an object brought back to earth by man.Gutheinz's team has already found a number of the missing moon rocks through their investigations. They recently located the missing Arkansas moon rock, which had been mistakenly removed with Bill Clinton's gubernatorial papers when his office was cleaned out after his presidency; the rock was located by an archivist. A Michigan State University film crew, led by 17-time Emmy award winner Troy Hale, is engaged in documenting the hunt for missing moon rocks. The film project will include one feature length documentary and one, or possibly two, shows of the type seen on the Discovery Channel.

THE MEDIA SANDBOX
Colin Marshall
Category: Digital Media, Section 2
Location: Lake Erie Room, 1:00 PM
Mentor(s): Henry Brimmer (Advertising, Public Relations, and Retailing)

The Media Sandbox attempts to foster a collaborative atmosphere in which students from different majors in the College of Communication Arts and Sciences can explore, discover, and play together. With creative "toys" in the Sandbox (cameras, software, photo/video studios, etc.), students hold access to all the essential tools to manifest their creative ideas in a physical form. The new curriculum combines disciplines from the telecommunication world such as photography, video, information graphics, web development, video game design, and more to achieve one common goal: create something no one has ever seen before. In this presentation, Colin Marshall will display a short documentary of the curriculum's first year through the eyes of students, faculty, and staff to better understand how the Media Sandbox shapes itself into a non-traditional, but innovative and inspiring education system.

THE WAITING ROOM
Michael Harvey, Dennis Corsi
Category: Digital Media, Section 2
Location: Lake Erie Room, 1:15 PM
Mentor(s): Amol Pavangadkar (Telecommunication, Information Studies, and Media)

Nonverbal cues play a key role in communication and the building of relationships. But can you create a dialogue without saying a word? The comedic short film "The Waiting Room" explores the trials and challenges of meeting a stranger across a crowded room. Can the impersonal setting of a hospital waiting room bring two people together, or will it keep them forever apart?

MEDICAL MARIJUANA
Caron Creighton, Derek Berggren, Patricia Cashen, Johanna Forsberg, Andrea Nelson
Category: Digital Media, Section 2
Location: Lake Erie Room, 1:30 PM
Mentor(s): Bob Albers (Telecommunication, Information Studies, and Media)

Medical marijuana use holds countless negative stereotypes. Many people consider marijuana users to be lazy, unproductive, criminals and drug abusers. This documentary is intended to break these stereotypes by telling the stories of the people who need medical marijuana just to function in their everyday lives. These people are afraid to admit to using medical marijuana because of the negative perception of marijuana use, in addition to the ambiguity of the laws surrounding medical marijuana. We interviewed patients, lawyers, dispensary owners, politicians, caregivers and other productive members of society in order to shed light on the controversy surrounding medical marijuana.

868 - A DOCUMENTARY FILM ABOUT CHINESE INTERNATIONAL STUDENTS
Seth Beifel, Chris Buller, William Chodos, Kiersten Latowski
Category: Digital Media, Section 2
Location: Lake Erie Room, 1:45 PM
Mentor(s): Geri Zeldes (Journalism)

The project we worked on highlights the number of Chinese students enrolled at Michigan State in the form of two separate projects, "For Here or To Go" and "The 868-China Project". This past fall we had 868 Chinese freshmen enroll, more than the University of Michigan. Through our interview and research process, we have noticed a rising trend of China-centric activity on campus and in the East Lansing area ranging from the springing up of new student organization to local businesses geared towards Chinese students. Since 2009, the number of Chinese students has increased roughly 71 percent to 2400. One theme that we have been focusing our work around is "For Here or To Go," which is a question that many Chinese students face as they have the difficult decision of whether to remain in the United States after their college years or head back home to China. While there are many overarching and undermining themes regarding our project, we have centered our focus on the students themselves. We opted to select a handful of students to follow around and present their daily interactions with the Michigan State community as a way of presenting the reality of the international student experience. This research is important as it is able to call attention to the necessity to accept the benefits that international students provide to the university setting and what that may mean for post-graduation of all collegians.

THURSDAY MATINEE
Peter Savinov
Category: Digital Media, Section 2
Location: Lake Erie Room, 2:00 PM
Mentor(s): Amol Pavangadkar (Telecommunication, Information Studies, and Media)

"Thursday Matinée" is a short, independently produced drama film following the events of one extraordinary night in the lives of four ordinary recent college graduates. In an attempt to add some excitement to their boring, monotonous lives, a group of four friends spontaneously decides to murder a convenience store clerk. The film follows the incident and each of the friends' reactions to their crime.

EFFICIENT RENDERING OF HUMAN SKIN IN UNITY3D
Jonathan Moore
Category: Digital Media, Section 2
Location: Lake Erie Room, 2:15 PM
Mentor(s): Brian Winn (Telecommunication, Information Studies, and Media)

Developers of real-time graphics applications are painfully aware that viewers can more easily identify graphical flaws with objects that they are more familiar with, for example a home office would be much more difficult than a forest on an alien planet. Human skin is something familiar to all users, and it has properties that make it difficult to properly simulate in a real-time application. As such, the rendering of human skin to be applied to characters in video games is an area worthy of much attention. The shading models used for most objects in a game fail to capture the effect of light scattering below the surface to create its soft appearance, an effect known as subsurface scattering. In 2007, NVIDIA released a landmark demo for a real-time rendering of a human head, but their techniques pushed modern graphics processors to their limits, leaving little room for actual rendering of a full game or application. Since then, there have been several attempts to create more efficient approximations off skin shading for real world use. Pre-Integrated Skin Shading is one such technique that was developed by Eric Penner in 2010. This talk will detail the successful implementation of Pre-Integrated Skin Shading in Unity3D, a popular 3D game engine used in many classes and projects at Michigan State University.

EMERGENT NARRATIVE POSSIBILITIES IN INTERACTIVE THEATRE
Joshua Whitson
Category: Digital Media, Section 2
Location: Lake Erie Room, 2:30 PM
Mentor(s): Alison Dobbins (Theatre)

What happens when the traditional theatre audience is given control over the plot and structure of a theatrical performance? Focusing on media and video game concept integration in the theatre, this presentation aims to change the idea of what it means to be an active audience member. As well as, explore the boundaries of the new genre of digital theatre.

STAYCATION FILM TRAILER
Anthony Maccio, Diana Busby, Justin Grosjean, Kelsey Hansen
Category: Digital Media, Section 2
Location: Lake Erie Room, 2:45 PM
Mentor(s): Amol Pavangadkar (Telecommunication, Information Studies, and Media)

Staycation tells the story of a young couple, who in an attempt to have a truly relaxing vacation, lie to their friends and family, telling them they'll be leaving the country for two weeks. The plan works, so well in fact that it manages to fool two amateur criminals who have planned on robbing the house during the couple's assumed absence. Upon entering they discover the pair, Sean and Pam, still inhabiting the house. In their panic, the criminals chase them down, holding them captive under the assumption they'll have time to figure the situation out. But as with everything up to this point, all does no go according to plan, with the robbers and the young couple ultimately creating a friendship of a lifetime. The trailer for this film was made in TC 442, with the specific goal in mind to create a piece that could not only be shown to draw audiences in, but to also garner enough attention to turn the trailer into a legitimate feature. Using production and editing skills learned over time within the Media Arts department, Staycation is a testament to the skills and vision that both the group and the department have worked so hard to make a reality.

HUMAN INTERACTION WITH MEDIA
Nathan Kesto
Category: Digital Media, Section 3
Location: Parlor C, 1:00 PM
Mentor(s): Alison Dobbins (Theater)

Adding media technology to physical interactions encourages human engagement. There are many ways of implementing media technology. For this research, I incorporated circuits into physical objects to add audio and visual feedback. These objects will be used to portray a mythical event. The reality of the event will be enhanced because of the circuits. With the audio and visual feedback, human engagement will not only be encouraged but it will also be increased once the subject is engaged. This shows that adding media and not replacing physical interaction can achieve increased human engagement.

ADVANCING ENVIRONMENT AWARENESS
Daijah Street
Category: Digital Media, Section 3
Location: Parlor C, 1:15 PM
Mentor(s): Allison Dobbins (Theater)

When looking around Michigan State's campus many of the students seem oblivious to the environment around them. They walk around with headphones in their ears, in their own worlds. The fear is that while in these separate worlds, they are missing the many simplistic, once in a lifetime beauties of college life. My research strives to get the audience to pay more attention to their environment by getting them involved in it. The freestanding "scene" is just like any other wall in the room; only they are given the power to alter this one. This power, along with the level of anonymity grant the user the thrill of "defacing their surroundings", even if only for a moment. Providing the user with this thrill captures my main reasoning on doing this research. Although the participant does have control over what they draw, they do not know where on the scene it will go. This level of spontaneity is just enough to still make things exciting for the user. The working of this scene is similar to the way things work in everyday life, helping to attain my end goal. Seeing an out of the ordinary scene, makes one stop and

pay attention. That is exactly what my project is meant to do. Ideally, when students are walking through campus, they'll see the display and stop in their tracks. It will take them by surprise and hopefully cause them to pay a little more attention in their everyday life.

INCREASING FINANCIAL LITERACY THROUGH MEANINGFUL PLAY
Chad Fleming David Cornelius
Category: Digital Media, Section 3
Location: Parlor C, 1:30 PM
Mentor(s): Brian Winn (Telecommunication, Information Studies, and Media)

Managing ones finances can be a daunting task, especially with limited experience. The challenge of learning how credit works, how to implement a monthly budget, and how to properly handle ones finances in general is that mistakes can have real-world costly consequences. To aid in this challenge, Spartan Villa bridges this gap by creating a realistic financial system imbedded in a fun, low pressure game world. Spartan Villa introduces the player to critical financial concepts through the virtual management of a college house, making them responsible for expanding and maintaining their house by utilizing their finances effectively. Paying bills on time, allocating funds to the proper accounts, and monitoring their monthly spending are important aspects of the gameplay; ultimately this allows the player to purchase rooms to expand their house, host social events to attract future tenants, and increase their overall credit score. By successfully completing these tasks in the game, the player is able to learn effective money management skills and increase their financial literacy in a way that is engaging as well as accessible to a younger audience.

USING GESTURES TO SHOW FEELINGS ON THE SCREEN
Xinjie Peng
Category: Digital Media, Section 3
Location: Parlor C, 1:45 PM
Mentor(s): Alison Dobbins (Department of Theatre)

The project focused on making connections between actor gestures and perceived emotions. The actors on the stage actually control the change of the videos playing in the screen of the theater by making exaggerated gestures. This connection between actors and the change of the background videos relates to the audience perception of the emotion portrayed by the actors. The abstract gestures such as Kabuki style are art styles, but the videos helped the audience to understand the meanings and motions of these gestures. And this would meet the goal of this project which is to help the audience to empathize with the character portrayed.

Education

Oral Presentations

AGE DIFFERENCES ON CONCUSSION SYMPTOMS, POSTURAL STABILITY AND NEUROCOGNITIVE PERFORMANCE
Alexander Dailey, Kelly Christopher, Kristyn Wilhelm
Category: Education, Section 1
Location: Tower Room, 9:00 AM
Mentor(s): Tracey Covassin (Kinesiology)

Background: Researchers have begun to focus on age differences (ie., high school vs collegiate) in concussion outcomes. Results suggest that younger athletes may take longer to recovery from a concussion. However, little is known about the interactive effects of age on symptoms, neurocognitive testing (NCT), and postural stability. Hypothesis/Purpose: The purpose of the study was to examine age differences in symptoms, NCT, and postural stability following concussion. We hypothesized that high school athletes would have worse symptoms, NCT, and postural stability than college athletes. Study Design: Prospective cohort study. Methods: A total of 296 concussed athletes from a multi-state, two-year study were enrolled in the study. Participants completed the Immediate Post-concussion Assessment and Cognitive Test (ImPACT) and Post-concussion Symptom Scale (PCSS) at baseline; and again at 2, 7, and 14 days post-concussion. Participants completed the Balance Error Scoring System (BESS) at 1, 2, and 3 days post-concussion. Results: High school athletes performed worse than college athletes on verbal (M=78.8%: 82.7%) and visual (M=65.8%: 69.4%) memory. High school athletes were still impaired on verbal memory 14 days post-concussion compared to collegiate athletes (p=.001). High school males scored worse on the BESS than college males (M=18.8: 13.0). College females scored worse on the BESS than high school females (M=21.1: 16.9).
Conclusion: The results of the current study supported age differences in memory and postural stability following concussion that warrant consideration from clinicians and researchers when interpreting symptoms, specific components of NCT, and postural stability tests.

THE LUNCH LINE: HOW CHANGES IN SCHOOL MEALS IMPACT STUDENTS' OVERALL DIETS
Hali Sobczak
Category: Education, Section 1
Location: Tower Room, 9:15 AM
Mentor(s): Katherine Alaimo (Food Science and Human Nutrition)

Recently, the USDA adopted new regulations for the National School Lunch Program (NSLP) and School Breakfast Program (SBP). Changes include increasing whole grains and variety of vegetables while decreasing the fat and sodium content of reimbursable school meals. The new school meals will provide an opportunity for students to incorporate nutrient-dense foods into their diets. However, a question remains as to how changes in cafeteria food options impact students' overall diets. The School Nutrition Advances Kids (SNAK) project examined the food available in 52 low-income middle schools throughout the state of Michigan from 2007-2010. Food service data for breakfast and lunch meals were collected for one-week intervals twice a year (Fall, Spring) for two years. Overall diet of 7th grad students (fall) followed to 8th grade (fall) were measured by one-week Block food frequency questionnaires (FFQ). Food service data was analyzed for changes in categories of food items served as well as for changes in the nutrient content of the meals based on a daily averages from the initial to the follow-up school year. We hypothesize that decreasing the daily averages of high calorie and high fat lunch and breakfast options and increasing vegetable choices will decrease the fat and calorie and increase fiber and vegetable content of students' diets. The results of this study will be useful to inform schools on the importance of following USDA guidelines to provide students with nutritious food options.

THE RESILIENCE OF AFRICAN AMERICAN COLLEGE STUDENTS FROM "HIGH-RISK" ENVIRONMENTS
Jenise Noble
Category: Education, Section 1
Location: Tower Room, 9:30 AM
Mentor(s): Dorinda Carter Andrews (Teacher Education)

Many researchers have focused on the reasons why African American students from urban, high-risk backgrounds do not go on to college. With this being the case, few studies focus on the reasons why African American students from these areas do succeed and go on to college. In interviewing ten African American college students, many highlighted that the positive influences, along with the motivation to have a better life than their parents gave them the drive to display resilience. The data reveals that in displaying resilience, participants were not only able to go on to college, but they were able to remain there because of the resources and positive social networks that motivated them. The importance of this implication is significant in that further research must be done to provide these resources to other students from high-risk backgrounds that may not otherwise have access to them.

EXAMINING THE RACIAL AND ACHIEVEMENT IDENTITIES OF HIGH ACHIEVING BLACK STUDENTS IN PREDOMINATELY BL
Christopher Thomas
Category: Education, Section 1
Location: Tower Room, 9:45 AM
Mentor(s): Dorinda Carter Andrews (Teacher Education), Dorothy Hines (Teacher Education)

The academic underperformance of African-American students in the public school system is often the predominant discourse in educational research. Several researchers have assessed the role of race and achievement in urban and suburban school districts from the perspectives of teachers, administrators, and school staff. However, the narratives of high-achieving African-American students are often not highlighted within the context of non-White schools.This research study examines how high-achieving African-American students in predominately African-American high schools perceive their racial and achievement identities. Study participants included 58 high school students that were enrolled in the 2011 Summer High School Scholars Program at Michigan State University. Qualitative and quantitative data was collected through focus group interviews and a Racial Identity Scale developed by Dr. Carter Andrews. Data collected included student reflections on their racial identity, aspirations, and beliefs about the schooling process. Research participants attend predominately African-American schools in urban and suburban districts. The results of the study indicated that teacher attitudes, teacher-student interpersonal relationships, school culture, and school climate shaped how students conceptualized their racial identity and achievement ideology. The use of student voice was instrumental in underscoring how high-achieving African-American youth experience high school and in contextualizing academic achievement. There are implications for pre-service teachers, current educators, students of color, and administrators in predominately African-American high schools. This study challenges how educators perceive the actions and perspectives of African-American youth in order to foster collaborative and congenial academic outcomes for all students.

SUSTAINABLE ACTIVISM: LIBERATION THROUGH PEDAGOGY
Jasmine Fountain
Category: Education, Section 1
Location: Tower Room, 10:00 AM
Mentor(s): David Walton (African American and African Studies), Shanti Zaid (African American and African Studies)

Despite the vast amount of research documenting problems in the lower African American high school graduation and college retention rates, there is little consensus about the nature of these issues and the most effective ways to address them in areas of pedagogy and curriculum. There is also less research on the impact that the Eurocentric framework has on disenfranchised students and the ways in which a pedagogy based on the critical race theory can increase the high school graduation rates and the college aspirations of African Americans. In the African American community, many students graduate high school, but few actually attend and complete college. This creates a disparity in educational attainment which can have cyclical effects on the community like low wage employment, poverty, imprisonment and children born out of wedlock. This paper explores how pedagogy can be based on the critical race theory in order to positively impact students of color and inspire their investment in education. The purpose of this study is to critically analyze theories dealing with race, activism and education and how they can be formed into pedagogy to meet the needs of students from disenfranchised communities. The study includes an ethnographic comparative analysis of Malcolm X Academy, Eastern High School and East Lansing High School, as well as a

discourse analysis. This paper argues that a holistic approach is necessary when teaching students from disenfranchised communities. This approach must nurture the development of the students mind, body and spirit.

EXAMINING THE RACIAL IDENTITIES OF HIGH ACHIEVING AFRICAN AMERICAN STUDENTS IN PREDOMINATELY AFRICAN AMERICAN SCHOOLS
Patrice Wright
Category: Education, Section 1
Location: Tower Room, 10:15 AM
Mentor(s): Dorinda Carter Andrews (Teacher Education)

In educational research the predominant discourse is often the academic underperformance of African American students in the public school system. Research on the performance and racial identity of African American students in urban and suburban environments has often been assessed from various perspectives including educators, administrators, and other school personnel. These narratives are not often told from the perceptive of students of color who are high achieving. As well as students who do not attend non-White schools. This project examines how high achieving African American students in predominately African American urban and suburban high schools perceive their racial identity. This study was conducted with 58 students who were participants in the 2011 Summer High School Scholars Program at Michigan State. Students completed the Multidimensional Inventory of Black Identity – Teen (MIBI-t) developed by Robert Sellers and colleagues. Additionally, survey and focus group data was collected. Results of the MIBI-t and the focus group interview data indicated that race is a salient aspect of students' identity. This positive view allows them to continue to be high academic achievers. For these students high academic achievement and positive racial identity was shaped by home and school perspectives. There are implications of this study for pre-service teachers and other school personnel that can allow educators to craft teaching practices that will empower students and improve their school experience and academic achievement.

Poster Presentations

ENRICHING LESSON STUDY FOR PRE-SERVICE TEACHERS
Ashley Taglauer, Danny Johns, Andrew League, Kelli Siebers
Category: Education, Section 1
Poster #: 120
Location: Ballroom, 9:30 AM - 11:30 AM
Mentor(s): Jack Smith (Counseling, Educational Psychology and Special Education)

Lesson Study is defined by Fernandez and Yoshida (2004) as "The study or examination of teaching practice," (p. 7). As a math curriculum research team, the STEM project (Strengthening Tomorrow's Education in Measurement) has become interested in the success of Lesson Study in Japan and its replication in the United States, especially for practicing elementary teachers teaching measurement. We are currently developing an observation study that involves TE 402 students and their classrooms. The students, also known as the pre-service teachers, will work in groups to discuss in detail a lesson plan, taking into account what students might struggle with and how they will respond to the lesson. These groups will either design or adapt a lesson that will focus on some particular aspects of measurement. They will teach this lesson to a local classroom of elementary students, while the other members of their group observe how the students respond. Our observations will focus on how the group works before, during, and after the lesson, with particular attention to the post-lesson discussion. We will present a summary of this study regarding how Lesson Study is effectively used. Our purpose for this study is that we understand the post-lesson discussion in attempt to strengthen the Lesson Study assignment and to improve the post-lesson phase. We also hope to inspire the pre-service teachers to continue Lesson Study in their classrooms and schools, spreading the success of Lesson Study.

THE BA IN PROFESSIONAL WRITING: THE OTHER UNDERGRADUATE WRITING DEGREE
Catherine McCaffrey
Category: Education, Section 1
Poster #: 121
Location: Ballroom, 9:30 AM - 11:30 AM
Mentor(s): Jonathan Ritz (Writing, Rhetoric, and American Culture)

The rapid growth of bachelor's degree programs in professional writing provides new possibilities for students and new opportunities for faculty who teach writing. This presentation offers an intergenerational overview of one such program, as seen from the perspective of five unique stakeholders: a current undergraduate student; a recent graduate who went on to earn an MFA; two faculty members with creative writing backgrounds who teach in the program; and an administrator who directs the program.

DOES POINT VALUE AFFECT RECALL OF CONCEPTS?
Andrew George
Category: Education, Section 1
Poster #: 122
Location: Ballroom, 9:30 AM - 11:30 AM
Mentor(s): Tammy Long (Plant Biology)

College students regularly encounter assessments that vary in relative stakes, (i.e., the value of the assessment in terms of overall course grade). Our research evaluates the effect of point values on student effort. We hypothesize that within a given assessment students may allocate their effort based on the stakes associated with different questions. In Spring 2011, students in an introductory biology course for non-majors (n = 183) were given a quiz (total of 13 points) consisting of two isomorphic questions in which students constructed system models illustrating their understanding of two different biological processes. Half of the students received a version in which question 1 was valued at 3 points, and question 2 at 10 points; half the students received an alternate version in which point values were reversed. We are currently evaluating the effect of point value on students' responses. Following the course we developed a rubric composed of 7 criteria based on an expert response to the question that targeted factors such as number of concepts used and correctness of the model. Students were also assessed on a comprehensive final exam with four questions related to each of the topics that had been addressed on the quiz. Our analyses show that final exam performance was not affected by point value of questions on the earlier quiz suggesting recall of content may not be influenced by point value earlier in the course.

MOTIVATION AND ACHIEVEMENT IN U.S. UNIVERSITY STUDENTS
Erika Vivyan
Category: Education, Section 1
Poster #: 123
Location: Ballroom, 9:30 AM - 11:30 AM
Mentor(s): Estrella Torrez (Residential College in the Arts and Humanities)

The American school system is based on a series of achievements that students must make in order to become "educated." Many students continue on this educational path every day, but what is their motivation (or demotivation, for those who choose not to)? According to Fishbein's (1963) expectancy-value theory, a student's motivation to learn and achieve in school should be based on an expectation that she will succeed as well as the amount that she values her learning and achievement in school. More recently, this expectancy-value theory has been used to assess motivation through internal and external factors (Van Etten, Pressley, McInerney, & Liem, 2008). Scholars argue that parental, relational, gendered, racial, and personal factors play a role in students' expectancies and values related to academic motivation and achievement. The purpose of this study is to explore motivating forces for U.S.-born college students currently enrolled in full-time study at a university. Participants were recruited using a Facebook event page. Data was collected through an online survey limited to 100 respondents followed by interviews with 5 students. Results indicate that internal factors are recognized as more motivating than external factors. Additionally, students who are members of target and agent identity groups are affected differently by related motivational factors.

THE RELATIONS BETWEEN SPATIAL ABILITY AND EARLY MATH: AN EXPLORATORY FACTOR ANALYSIS
Kari Edington
Category: Education, Section 1
Poster #: 124
Location: Ballroom, 9:30 AM - 11:30 AM
Mentor(s): Yi-Ling Cheng (Counseling, Educational Psychology and Special Education), Kelly Mix (Educational Psychology)

Many studies have shown a link between spatial ability and mathematical competency. However, few studies have used children as subjects, or broken down spatial or mathematical abilities into sub-factors, and none have looked at a wide range of spatial and mathematical abilities. Within this study, we test multiple spatial and math abilities, and analyze them using exploratory factor analysis. By testing different kinds of spatial and math abilities, we hope to find common underlying factors between them, suggesting the use of the same cognitive processes and pathways. Eventually, we hope this study can help direct research (and practical applications) toward new types of instruction at the elementary school level to improve children's mathematical abilities.

WHAT'S IN YOUR TOOL KIT? CONCEPTS FOR EFFECTIVE EDUCATION IN A ZOO
Anna Hill
Category: Education, Section 1
Poster #: 125
Location: Ballroom, 9:30 AM - 11:30 AM
Mentor(s): Dr Dalen Agnew (Pathobiology and Diagnostic Investigation)

Two key components of almost every zoo's mission are to educate and entertain the visitor. The problem for many zoos, however, is achieving those goals without sacrificing one or the other. In an effort to synthesize both of these fundamental goals, I analyzed some of the different methods used to reach the public, their effectiveness, and the overall gain from these varying methods of visitor engagement by reviewing the literature. Using this information I have developed a set of methodologies, or a tool kit, for implementing effective educational programs based on the characteristics of zoo visitors: their goals, educational background, demographic distribution and purpose for visiting the zoo. To do this, I have used the sensitive topic of contraception in zoos as a prototype and have presented it in 3 distinct ways: verbal, visual, and interactive. I aim to compare the effectiveness of these educational tools in conveying information to the visitors. This tool kit will allow zoos to develop new and exciting ways to create a more informed public.

IMPROVING INVENTION STRATEGIES OF ACADEMIC WRITING USING WEB BASED TECHNOLOGIES
Madelyn Morris, Alaina Perez
Category: Education, Section 1
Poster #: 126
Location: Ballroom, 9:30 AM - 11:30 AM
Mentor(s): James Davis (Writing, Rhetoric and American Culture)

At present there are no viable writing software programs, in particular any that coincide with current composition and rhetoric trends and theories. Thus, adding an additional researcher to this CAL project will help expedite and link the phases necessary to understand and eventually to solve this problem through research, design, composition, testing, and implementation. The CAL URI researcher in place has been directly involved with literature searches and creating an IRB-approved survey to be distributed across the humanities departments at MSU (beginning with CAL). The additional researcher will begin designing and writing the inquiry-based content of the software itself. Once the survey results are collected, both CAL URI researchers can assist in examining this surveyed data to see what types of arguments are being created and in what settings. In sum, the CAL Research Assistants will help identify aspects of writing academic (i.e. argument) essays, in particular in the College of Arts and Letters, that need to be implemented into such an electronic program that stresses invention as an important part of the ongoing and overall writing process. As well, the researchers will help co-author a potential journal article for Computers and Composition Online that will show the need for new software that matches today's students' acceptance of electronic nonlinearity, relationships, and layering.

PRE-KINDERGARTEN CHILDREN'S ALPHABET KNOWLEDGE AFTER 80 DAYS OF CURRICULUM
Jessica Spence
Category: Education, Section 1
Poster #: 127
Location: Ballroom, 9:30 AM - 11:30 AM
Mentor(s): Nell Duke (Teacher Education)

This project examines alphabet knowledge in pre-kindergarten children before and after instruction in select letters and their associated sounds. The study focuses on a stratified sample of 24 children from four pre-kindergarten classrooms that are piloting a new curriculum. Within each of the four classrooms, two children from each of the following categories, as determined by the teacher, were assessed: low, medium, and high in terms of alphabet knowledge. The assessment involves asking children to name and provide one or more common sounds of each upper- and lower-case letter, presented in non-alphabetic order and with the letters a and g presented in both traditional and modern style. Analyses will indicate whether children are more likely to have knowledge of the letters that have been taught in the curriculum than letters that have not yet been taught. The results of the study will be helpful in evaluating the effectiveness of the curriculum instruction (though recognizing that clear causal inferences cannot be made without a control group) and will inform future curriculum development. Through this, pre-kindergarten teachers may be able to more effectively further children's alphabet knowledge.

CHEMISTRY TO COMPOSITION
Kathryn Vetter, Emma Foley, Jessica Glaser, Andrea Zuchora
Category: Education, Section 1
Poster #: 128
Location: Ballroom, 9:30 AM - 11:30 AM
Mentor(s): Juan Alvarez (Michigan State University Museum), Gary Morgan (Michigan State University Museum), Robert Root-Bernstein (Physiology)

Over the course of the 2011-2012 school year, our group has been planning a museum exhibit for the Michigan State University Museum. Our exhibit depicts the combination of the arts and sciences, focusing around Lejaren Hiller, a chemist who also started the movement of computer music. The exhibit displays a biography on Lejaren Hiller, the relationship between chemistry and music composition, and an explanation of some musical techniques used by Hiller in his compositions. The display includes interactive options where one can listen to different musical works composed by Hiller. In addition, we included a computer touch screen with a program where visitors can create their own computer music with a simple touch of the finger. We hope our exhibit can show people how two completely different subjects, art and science, can be easily connected, as well as providing hands on activities for all of the visitors.

GENDER PERFORMANCE DIFFERENCES IN THE LIFE SCIENCES
Leah Creech
Category: Education, Section 2
Poster #: 130
Location: Ballroom, 1:30 PM - 3:30 PM
Mentor(s): Ryan Sweeder (Chemistry)

This study examined the historical performance of students at Michigan State University in twelve life science courses for students enrolled from fall of 1997 to the spring of 2010 to find variables that significantly impact student success. Hierarchical linear modeling predicted 25.0 to 62.8 percent of the variance in students' grades in the courses analyzed. The primary predictor of a student's grade in a course was found to be the student's entering GPA; except for the second course in a series (Biochemistry II, Physiology II, and Organic Chemistry II), where the first series grade (Biochemistry I, Physiology I, Organic Chemistry I) was the best predictor. These variables were the most influential to the prediction model, as their ? values were consistently larger ranging from 0.315 to 0.662. The gender of the student was also statistically significant for a majority of the life science courses studied where female students were predicted to have GPA's of 0.067 to 0.303 lower than their equivalent male counterparts. Grades earned in prerequisite courses and the major of the student provided minimal additional predictive ability, whereas ethnicity provided none. Involvements in the Honors College or science residential college were generally insignificant for predictive ability as well.

HOW DO BIOLOGY UNDERGRADUATES "EXPLAIN" PHOTOSYNTHESIS? INVESTIGATING STUDENT RESPONSES TO DIFFERENT
Michele Weston
Category: Education, Section 2
Poster #: 131
Location: Ballroom, 1:30 PM - 3:30 PM
Mentor(s): John Merrill (Microbiology and Molecular Genetics), Mark Urban-Lurain (Center for Engineering Education Research)

One goal of assessment is to provide instructors with formative feedback about their students' understanding and misconceptions of class material. Constructed response questions can give an in-depth picture of what students know, as long as the question stem is written carefully to elicit the desired information. In previous work with a constructed response question on how plants gain biomass, we found that many students did not respond to the question by explicitly naming a process. This study investigated how responses change when the question stem is altered to explicitly ask for the process by which biomass is added to plants. The two versions of the stem were administered to 1237 students across three semesters. We analyzed the responses using SPSS Text Analytics for Surveys software to extract relevant terms and categorize them. The process category photosynthesis showed a significant increase in frequency from the first version of the stem to the second. The responses that named photosynthesis as their only process were less likely than before to use carbon dioxide, glucose/sugar, and carbon. Our results suggest novices (students) and experts (faculty) have different understandings of what constitutes an "explanation" in a scientific context and that constructed response questions must be worded carefully so that students interpret the questions correctly.

INTERVENING IN THE CYCLE OF SOCIAL REPRODUCTION
Allison Santori
Category: Education, Section 2
Poster #: 132
Location: Ballroom, 1:30 PM - 3:30 PM
Mentor(s): Ashley Talley (Education)

Social reproduction theory argues that how your parents brought you up is how you fundamentally end up acting, just like them. As an educator, it is important to understand SRT because as a parent or even if you are planning on being one, being the best that you are includes teaching them ways that they can adapt to be a successful individual. This paper explores social reproduction theory and the related concept of social construction by examining the experiences of the author and three individuals who share the same non-dominant identity as I, a lower middle-class individual. Using data obtained through qualitative interviews, I hope to use the conclusions drawn by social reproduction theorists and the experiences of participants in my study to make recommendations for my future 3rd Grade, English class curriculum.

FORMATIVE-ASSESSMENT PRACTICES OF MICHIGAN EDUCATORS
William Young
Category: Education, Section 2
Poster #: 133
Location: Ballroom, 1:30 PM - 3:30 PM
Mentor(s): Amelia Gotwals (Teacher Education), Ed Roeber (Counseling, Educational Psychology and Special Education)

The purpose of this study is to determine how effectively members of volunteer professional learning teams are able to learn about formative assessment and implement formative-assessment practices in their classrooms. The ultimate goal of this professional development model is to impact teachers' formative-assessment practices in order to improve student learning. Thus we will investigate classroom data – teachers' practices and student learning. However, we are also interested in the mechanisms for changing teachers' knowledge and beliefs. Thus we will also examine how learning teams function. This research should help the Michigan Department of Education and its contractors, as well as current and future project participants, better understand how to improve instruction and learning through formative-assessment practices. The results will also add to the existing body of research and theory on formative assessment.

EXAMINING SOCIAL REPRODUCTION OF SEXISM IN THE EDUCATIONAL SYSTEM
Alexa Cummins
Category: Education, Section 2
Poster #: 134
Location: Ballroom, 1:30 PM - 3:30 PM
Mentor(s): Ashley Talley (Education)

Social reproduction theory argues that and individual's identity is created solely by his or her environment and society. As an educator, it is important to understand SRT because one must be able to be knowledgeable of and attempt to counteract the stereotypes and preconceptions about the variety of students that will enter the classroom. This paper explores social reproduction theory and the related concept of social construction by examining the experiences of the author and three individuals who share the subordinate identity trait of being a female in a male-dominated nation. Using data obtained through qualitative interviews, I hope to use the conclusions drawn by social reproduction theorists and the experiences of participants in my study to make recommendations for secondary level curriculum.

EFFECTS OF THE TOOLS OF ENGAGEMENT ON SERVICE-LEARNING: A QUALITATIVE STUDY
Kristen Slater, Leanna Lim, Amanda Tomina, Kayla Weatherwax
Category: Education, Section 2
Poster #: 135
Location: Ballroom, 1:30 PM - 3:30 PM
Mentor(s): Jessica Barnes-Najor (University Outreach and Engagement), Hiram Fitzgerald (University Outreach and Engagement)

When conducting research, there are two aspects in which the researching team can undertake: the qualitative aspect and the quantitative aspect. The qualitative aspect focuses on describing the data in terms of quality or categorization. The quantitative aspect focuses on describing the data in numerical properties. In our research, we will be conducting a study of the qualitative aspects of service learning. We will be examining students' perceptions of how completing the Tools of Engagement, an undergraduate on-line series of modules about service learning, outreach, and engagement, influences the students' perception of their service learning experience. We hypothesize that someone who completes the Tools of Engagement modules will be more introspective in their reflections than students who do not complete the modules, and that students who completed the modules will be able to identify aspects of the modules that connected directly to their service learning experience. To test these hypotheses, we will conduct individual interviews with TE 250 students who have been randomly assigned to complete the modules (treatment group) or not complete the modules (control group). Student interviews will be recorded and coded on the level of self-reflection. Additionally, students who completed the modules will be asked to identify how the modules related to their service learning experiences.

DOES PRIOR EXPERIENCE WITH MODEL-BASED LEARNING PREDICT STUDENT ANALYSIS OF BIOLOGICAL SYSTEMS?
Patrycja Zdziarska, Neelima Wagley
Category: Education, Section 2
Poster #: 136
Location: Ballroom, 1:30 PM - 3:30 PM
Mentor(s): Joseph Dauer (Plant Biology), Kristen Kostelnik (Plant Biology), Tammy Long (Plant Biology)

Model-based learning may generate a deeper understanding of complex biological systems by prompting students to organize and integrate multidimensional information in a meaningful way. We investigated how prior experience with active construction of models influences student ability to analyze biological systems. By implementing a longitudinal study, we compared student-constructed models taken from their final examination in an introductory biology course to models constructed during an interview that took place two years after course completion. Using a rubric, we evaluated each of the models based on correctness of relationships and complexity of structure. During the interview, we also asked students to analyze biological systems by ranking nine sample models that systematically varied in correctness and complexity as " best", "most correct", and "most complex". Results showed that models constructed during the interview were lower in both correctness and complexity compared to final exam models. Moreover, student-constructed models were less correct (M=1.79, SEM=0.06) than models ranked as "best" (M=2.84, SEM=0.08) and as "most correct" (M=2.88, SEM=0.67). These findings highlight that introductory biology students' understanding of biological systems as reflected in the correctness of their models was not subsequently retained at the same level during the interview. It is possible that over time students stop constructing models and/or experience more passive than active, model-based instruction.

STUDENT TRENDS IN CRITICAL EVALUATION OF A MULTIMEDIA MODEL
Sasha Makohon-Moore
Category: Education, Section 2
Poster #: 137
Location: Ballroom, 1:30 PM - 3:30 PM
Mentor(s): Tammy Long (Plant Biology)

Michigan State University has identified analytical thinking as one of several liberal learning goals for undergraduates. An important component of analytical thinking is the ability to use prior knowledge to critically analyze and evaluate materials. This research aims to characterize students' critical evaluation of a scientific model widely available on the internet. The image typically appears as one of the first retrieved following a Google search on the term "chromosome", but is significantly flawed in terms of the biological information represented. In an introductory biology course designed for science majors, students (n=184) were asked to make a scientific claim about the quality of the model and provide support with at least two warrants or evidence. We are coding students' responses in order to quantify trends in the types of evidence students cite to justify their claims. For example, do students evaluate models using scientific reasoning (e.g., inaccuracies or errors) or superficial features that are not scientifically relevant (e.g., unpleasant colors, lack of labels). Data about students' evaluation skills improve our understanding of students' reasoning, and enable us to foster critical thinking as opposed to surface level evaluation of information obtained from media.

AN EXPERIMENTAL STUDY OF THE EFFECTIVENESS OF AN ON-LINE ENGAGEMENT TRAINING
Lisa Gulish, Laura Bailey, Jacqueline Cox, Jacob Gulick
Category: Education, Section 2
Poster #: 138
Location: Ballroom, 1:30 PM - 3:30 PM
Mentor(s): Jessica Barnes-Najor (University Outreach and Engagement), Hiram Fitzgerald (University Outreach and Engagement), Nicole Springer (University Outreach and Engagement)

This research project explores the effect of Tools of Engagement, an undergraduate on-line series of modules about service learning, outreach, and engagement, on a student's service learning. We hypothesize that someone who completes the Tools of Engagement modules will be more introspective in their reflections than students who do not complete the modules. In addition, we do not expect that agency evaluations will differ significantly for students who complete the modules compared to those who do not complete them. We do expect that student self-assessments will differ significantly for those who complete the modules as compared to those who do not. In order to test these hypotheses, we are conducting an experiment in which TE 250 students will be randomly assigned to two groups: treatment group (those who complete the modules), and control group (those who do not complete the modules). Student reflections will be rated based on a rubric that codes personal experiences and ability to relate their service learning experience to the topic of the writing to help us determine how introspective the students are in their writing. We will also look at the results of an online survey that we have designed for completion by the students. In the survey, students will report how much they have gained from completing or not completing the modules. Finally, agency supervisors will complete a rating scale regarding student service learning performance.

Engineering, Computer Science, and Math

Poster Presentations

TOWARDS PETAFLOP COMPUTATIONS
Kyle Ladd
Category: Engineering, Computer Science and Mathematics, Section 1
Poster #: 140
Location: Ballroom, 9:30 AM - 11:30 AM
Mentor(s): Benjamin Ong (Institute for Cyber Enabled Research)

This project is interested in leveraging existing high performance linear algebra libraries such as the Math Kernel Library (MKL), Automatically Tuned Linear Algebra Software (ATLAS), and the Portable Extensible Scientific Computing Toolkit (PETSc) within existing legacy codes to further add scalability. Time permitting, different profiling tools will be explored.

INVESTIGATION OF MEMBRANE-MEDIATED TRANSPORT OF HYDROGEN IONS
Logan Matthews
Category: Engineering, Computer Science and Mathematics, Section 1
Poster #: 141
Location: Ballroom, 9:30 AM - 11:30 AM
Mentor(s): Robert Ofoli (Chemical Engineering and Materials Science)

This project concerns the development and assessment of two membrane-based protocols for facilitated transport of hydrogen ions. The first involves the nanoscale assembly of Cytochrome c Oxidase (CcO), which is tethered to a gold electrode using a sequence that chelates the gold surface, allowing for the binding of histidine-tagged CcO. The histidine tag ensures proper orientation of CcO, which is necessary for proton transport. CcO is subsequently incorporated into a lipid membrane by placing the gold in a bulk solution containing detergent-solubilized lipid molecules. The detergent is then removed by dialysis using biobeads. Successful construction of the protein-tethered bilayer lipid membrane (PtBLM) is assessed using cyclic voltammetry and electrochemical impedance spectroscopy, which detect current flows in the system. Successful binding of CcO has been demonstrated, but a functional membrane has not yet been constructed. The second option is the perfluorinated polymer Nafion, which can be used as a substitute for a PtBLM. Nafion is a proven proton transport membrane developed by DuPont. The goal is to use either of the two membrane systems on a microfluidic platform to transport hydrogen ions generated by water oxidation into a separate chamber where the ions will be reconstituted to hydrogen fuel. This system has the potential to provide a portable hydrogen source for fuel cell applications.

RAPID DETECTION OF ESCHERICHIA COLI O157:H7 USING A NANOPARTICLE-BASED BIOSENSOR
Michael Huarng
Category: Engineering, Computer Science and Mathematics, Section 1
Poster #: 142
Location: Ballroom, 9:30 AM - 11:30 AM
Mentor(s): Evangelyn Alocilja (Biosystems Engineering)

Escherichia coli O157:H7 is one of the most frequently reported causes of foodborne illnesses that serves as a major threat in food safety. Although there are many methods commercially available to detect E. coli O157:H7 that meet food safety standards, many are plagued with issues such as long detection times, expensive reagents and equipment. For these reasons, much research has turned to the utilization of sensitive, inexpensive nanotechnology and biosensors to address these inadequacies. In this study, a magnetic nanoparticle-based biosensor coated with antibodies was used to immunomagnetically separate E. coli O157:H7 cells. The resulting structures were placed on carbohydrate coated screen-printed carbon electrodes (SPCEs) and analyzed through an electrochemical test called cyclic voltammetry. Special focus was devoted to analyzing the detection limits of the biosensor at concentrations lower than 10 colony forming units per milliliter (CFU/mL) - concentrations similar to the detection limit of current testing methods. Thus far, the extraction protocol's LOD50 from broth cultures is 6-9 CFU/mL and the LOD from broth cultures is 1 CFU/mL. These findings suggest that the immunomagnetically-based biosensor can serve as a viable tool for a field-based detection of pathogenic contaminants. The biosensor is simple to operate, requires

no fancy equipment, can be handheld and battery-operated, and very inexpensive. Because there is no enrichment step, the detection time is much shortened.

THE EFFECT OF DOPANT AND TIME ON THE ELECTRICAL CONDUCTIVITY OF ELECTROTEXTILES
Krista Lueck
Category: Engineering, Computer Science and Mathematics, Section 1
Poster #: 143
Location: Ballroom, 9:30 AM - 11:30 AM
Mentor(s): Evangelyn Alocilja (Biosystems Engineering)

High-surface area nano-fibers can be developed into electrotextiles designed for use in sensor signal transduction. Work was performed to quantify the effect that the inclusion of a dopant chemical had on the electrical conductivity of a polymer coated electrotextile. Work was also performed to determine the relationship between the textile conductivity and polymerization time. Electrotextiles can be used in a variety of field applications, and the optimization of their physical properties can prove useful in developing them to replace other materials. Five variations of each parameter were selected and tested using resistance measurements across the surface of each sample. The optimal parameters were defined as the parameters that resulted in the lowest and most consistent resistance measurements. These parameters were employed in biosensor applications.

ADAPTIVE RADIATION OF SPECIALIST AND GENERALIST ANCESTORS IN AVIDA
Suhas Devangam
Category: Engineering, Computer Science and Mathematics, Section 1
Poster #: 144
Location: Ballroom, 9:30 AM - 11:30 AM
Mentor(s): Charles Ofria (Computer Science and Engineering)

The question of why some clades diversify more than others is a perplexing one. One avenue of research studies adaptive radiation from generalist and specialist ancestors. Conventional wisdom suggests the hypothesis "from generalists to specialists," where generalist ancestors are the source of adaptive radiation and result in specialist descendants. Different biological systems demonstrate different trends in the evolution of ecological specialization or generalization. We turn to digital organisms in the Avida platform, in which we are able to run experimental tests using known ancestors to evolve diversity, definitively quantify generalism versus specialism, and use large sample sizes, which are difficult to accomplish in biological systems. Our results demonstrate that communities with specialist founders have more diversity, contradicting conventional wisdom. We measured the effect of pleitropy in the genomic architecture of the founder organisms, and ecological opportunity of available resources in the environment as possible causes for this trend.

POROUS SUPPORTS FOR NON PRECIOUS METAL ELECTRO-CATALYSTS FOR OXYGEN REDUCTION
Jennifer Andrews
Category: Engineering, Computer Science and Mathematics, Section 1
Poster #: 145
Location: Ballroom, 9:30 AM - 11:30 AM
Mentor(s): Scott Barton (Chemical Engineering)

The project seeks to maintain increased control the iron content in metal-nitrogen-carbon catalysts for oxygen reduction in proton exchange membrane fuel cells. In this study the impact of iron impurities in the "as received" precursors is observed. More specifically iron has been leached from the carbon black precursor to explore how this changes catalyst activity and morphology.

THE EFFECT OF PARASITES ON THE EVOLUTION OF SEXUAL RECOMBINATION
Mairin Chesney
Category: Engineering, Computer Science and Mathematics, Section 1
Poster #: 146
Location: Ballroom, 9:30 AM - 11:30 AM
Mentor(s): Charles Ofria (Computer Science and Engineering)

Avida is an artificial life software platform that allows for the study of evolutionary biology through the maintenance of populations of self-replicating and evolving computer programs. Avida allows us to study evolutionary theories in silico as opposed to in vivo, drastically reducing the amount of time such experiments usually take. I use Avida to study the possible effects of parasites on the evolution of sexual recombination. Sexual recombination is the process by which an offspring receives half of its genes from each parent. Due to the timescales for complex features to arise, the evolution of sexual recombination has had only limited empirical study. Using digital organisms, however, I am able to compare the persistence of parasites between sexual and asexual populations and am now performing experiments where I let organisms choose their mode of reproduction. Digital evolution provides insight into the evolution of complex traits, and can be easily manipulated to study hugely varying characteristics of biology such as cooperation, sexual reproduction, predator-prey interactions, and host-parasite relationships. As we gain understanding of how and why organisms evolve one way or another, we may start understanding the directions organisms will evolve in the future. Evolution is ongoing, and if we can harness our understanding of pathogen evolution to develop new management and treatment regimes, the implicit guesswork involved in treating diseases could be reduced.

ENZYMATIC BIOFUEL CELLS
Kathryn Worley
Category: Engineering, Computer Science and Mathematics, Section 1
Poster #: 147
Location: Ballroom, 9:30 AM - 11:30 AM
Mentor(s): Scott Calabrese-Barton (Chemical Engineering and Material Science)

Enzymatic biofuel cells involve the use of enzymes as catalysts as opposed to the precious metal platinum, commonly used in the hydrogen fuel cell. The use of enzymes can be a less expensive alternative to the use of a platinum catalyst. However, the electrical output of the enzymatic biofuel cell is currently much lower than that of the platinum catalyzed fuel cell. There are a variety of enzymes that have potential to be useful for applications in biofuel cells including glycerol dehydrogenase. The optimum electron output for this enzyme is dependent on the cofactor nicotinamide adenine dinucleotide hydride (NADH) and knowing the stability of this cofactor in the buffer solutions is necessary to get an accurate idea of the stability of the fuel cell.

MONTE CARLO FOOD IRRADIATION SIMULATION ANALYSIS AND COMPARISONS
Quincy Suehr
Category: Engineering, Computer Science and Mathematics, Section 1
Poster #: 148
Location: Ballroom, 9:30 AM - 11:30 AM
Mentor(s): Sanghyup Jeong (Biosystems Engineering), Bradley Marks (Biosystems Engineering)

Low energy X-ray food irradiation is a viable and efficient process in order to safely destroy microorganisms that contaminate products in the food and agricultural industry. Using Particle Physics Simulation toolkits, an accurate description of the physical processes within an X-ray machine are created to determine the time needed to fully decontaminate a material under the exposure of the X-rays. Using a computer simulation of the food irradiation process is a more cost-effective alternative to experimental validation of required X-ray dosage rates. The present study develops a simulation of a Food Irradiator using the open-source C++ Monte Carlo particle physics simulation toolkit GEANT4 (GEometry And Tracking) and tracks the dosage distribution throughout biological materials using CT-Scan images. Given this data, the log reduction of the bacteria in the material is determined. The simulated exposure time is then compared against real-life results for validation and used for further analysis or improvements to the Monte Carlo simulation. Ultimately, providing a modeled exposure time for the industry to safely irradiate food product reduces costs due to experimental time and resources.

AN INSPIRATION OF INNOVATION
Hannah McQuade
Category: Engineering, Computer Science and Mathematics, Section 2
Poster #: 150
Location: Ballroom, 9:30 AM - 11:30 AM
Mentor(s): Jon Sticklen (Applied Engineering Sciences)

The objective of this study is to observe a set develop key dimensions of successful innovation in engineering/technology grounded companies. I hope to determine key similarities and differences among the innovations listed in Time Magazine's "50 Best Innovations" list for 2011 as well as between the literature I've studied. Background: Over Fall 2010 and Fall 2011, I did in depth readings on innovation in engineering companies to build basic understanding, and to develop the characteristics of innovative situations which I propose fit the case studies I read. Method: I take the list of dimensions which resulted from my earlier studies and use them as framework for analysis of Time?s ?50 Best Innovations?. I make correlations between successful innovative companies and the books written about them and the state of the innovative world.

OPTIMIZATION OF CULTURE CONDITIONS FOR ENZYME PRODUCTION WITH MUTANT FUNGI STRAIN TRICHODERMA REESEI
Al Culbertson
Category: Engineering, Computer Science and Mathematics, Section 2
Poster #: 151
Location: Ballroom, 9:30 AM - 11:30 AM
Mentor(s): Jon Walton (Plant Biology)

Ammonia Fiber Expansion pretreated corn stover (AFEX-CS) was used to culture Trichoderma reesei RUT C30. In-house production of cellulase using lignocellulosic material as a sole carbohydrate source could prove to be beneficial in cost, as well as enzyme specificity for its substrate. Effects of various seed culture and fermentation conditions for cellulase production using AFEX-CS as carbohydrate source were elucidated. Results indicate that spore inoculation size in seed culture has large effect on fungi morphology, as well as enzyme production, with lower inoculation size resulting in hyphae morphology as well as increased cellulase activity, respectively. AFEX-CS concentration in fermentation also played a large role in cellulase production with enzyme activity decreasing as you increase concentration above 5 g/L. Other seed culture conditions such as potato dextrose broth concentration, culture duration, and pH control had negligible effects.

FRACTURE MECHANICS OF CHOCOLATE BARS
Doug Schriner
Category: Engineering, Computer Science and Mathematics, Section 2
Poster #: 152
Location: Ballroom, 9:30 AM - 11:30 AM
Mentor(s): Carl Boehlert (Material Sciences)

Fractography plays an important role in determining the method by which a part has failed. By observing a fracture surface, one can determine information such as whether a part failed by ductile or brittle means, where the fracture began, and whether or not fatigue was involved in the failure. Normally considered a simple delicious treat, chocolate bars demonstrate a variety of these "sweet" features on their fracture surfaces. For this study, chocolate bars of varying composition were deformed to failure under tensile loading. Scanning Electron Microscope Images were taken of the fracture surfaces, and are used to determine the fracture mechanics of the chocolate bars.

LIVING WITH AN EDGE
Tim Maul
Category: Engineering, Computer Science and Mathematics, Section 2
Poster #: 153
Location: Ballroom, 9:30 AM - 11:30 AM
Mentor(s): Carl Boehlert (Chemical Engineering and Materials Science)

Forensic Scientists are often asked to calculate the force required to inflict a wound. They do this by analyzing multiple variables, one of which is the sharpness of the object used. The purpose of this research project is to determine the “sharpness” of an assortment of household items using a Scanning Electron Microscope to image the edges and points, both

new and used. The items will be analyzed in two categories: blades and points. The blade group contains Stanley Single edge razors, Bic Disposable Shavers, a 3.5 inch Mainstays High-Carbon Stainless Steel Paring Knife, and a 1.5 inch Gerber Foldable Pocket Knife. The razors and shavers will be imaged, used, and then imaged again. The knives will be imaged in their current condition and then sharpened with a Smith's 4 inch Fine Grit Diamond Sharpening Stone for reimaging. The point category contains Dritz Size 7 Embroidery Needles and Eagle Claw Fishing Snells. These will also be imaged before and after use. To compare the items, they will be imaged with increasing magnification until significant defects can be detected. These results will offer a unique perspective on the edge of blades as well determine how these edges are affected by use.

STRUCTURAL DIFFERECES BETWEEN SUB-SAHARA AFRICAN–TYPE HAIR AND CAUCASIAN HAIR; THEIR ROLE IN THE ADAPTATION OF SUCH INDIVIDUALS TO THEIR NATIVE ENVIRONMENTS

Kwasi Adu-Berchie

Category: Engineering, Computer Science and Mathematics, Section 2
Poster #: 154
Location: Ballroom, 9:30 AM - 11:30 AM
Mentor(s): Carl Joseph Boehlert (Chemical Engineering and Materials Science)

Even though the differences in the color, texture and length of human hair vary gradually along the spectrum, one cannot help but to notice the stark difference between Sub-Sahara African –type hair and the Caucasian hair. A person who hails from Sub – Sahara Africa typically has dark hair with hair density between 49 to 390 hairs/cm^2 and hair growth rate of 129 to 436 µm/day (Geneviève Loussouarn PharmD*, Charles El Rawadi PhD, Gilles Genain PhD). The Caucasian, on the other hand has hair color which varies from light brown to dark, hair density between 80 to 488 hairs/〖cm〗^2 and hair growth rate of 165 to 506 µm/day (Geneviève Loussouarn PharmD*, Charles El Rawadi PhD, Gilles Genain PhD). The above differences make it clear that the Caucasian hair is denser and has a higher growth rate than the African hair. This research therefore examines the microstructure difference between sample African hair strands and sample Caucasian hair strands using scanning electron microscopy. The research further attempts to determine whether the differences in hair structure between these two groups could be essential in the adaptation of such individuals to their native environments.

DETERMINATION OF THE LIVE/DEAD BINDING SELECTIVITY OF D-MANNOSE FOR E. COLI O157:H7

Patrick Fewins

Category: Engineering, Computer Science and Mathematics, Section 2
Poster #: 155
Location: Ballroom, 9:30 AM - 11:30 AM
Mentor(s): Vangie Alocilja (Biological and Agricultural Engineering)

Detection of E. coli O157:H7 has long been a concern of food safety testing. Of methods available today, none are fast or simple for the average user. Currently, an antibody based biosensor utilizing the carbohydrate binding properties of E. coli O157:H7 on the detection platform is being tested experimentally. It is called the M3 Biosensor. It is cost effective, user friendly, and effective, however, one concern with this type of sensor apparatus is its possible non-specificity for live cells versus dead cells in the binding to the platform carbohydrate. To determine the selectivity of such a system, the carbohydrate was linked to glass slides so that the cells could be differentially stained and visualized to determine binding selectivity. We hypothesize that the M3 Biosensor can bind selectively to the live cells. Preliminary results suggest that this preferential binding exists. Only live cells cause disease. Resolving this dilemma for the M3 Biosensor will widen the scope of use for this test when fielded.

APPLICATION OF SPATIAL ANALYSIS TOOLS TO PROJECTION OF EYE TRACKING DATA

Greg Ruetenik

Category: Engineering, Computer Science and Mathematics, Section 2
Poster #: 156
Location: Ballroom, 9:30 AM - 11:30 AM
Mentor(s): Julie Libarkin (Geological Sciences)

Eye tracking is commonly used in research as a method for analyzing the efficacy of scientific images and other media. Commercial software designed to perform these analyses often decouples data points representing areas of human focus (fixations) and areas of search (saccades) through various filters, projecting the resultant fixations. Commercial software typically provides a limited number of filtering and projection methods, as well as corresponding parameters for each method. Spatial data analysis software such as ArcGIS provides a more robust environment for projecting and analyzing this data. We

have developed an innovative approach for projecting eye tracking data in ArcGIS by interfacing it with scripts written in the Python programming language. This involves clustering recorded gaze points in order to produce fixations using various filters, including those based on eye position (I-DT) and those based on eye velocity (I-VT). The spatial and temporal relationships between gaze points within clusters can be quantified using spatial statistics tools built into ArcGIS, and this quantitative approach is used for a comparative analysis between clustering methods. Additionally, we have simulated various other projection methods performed by eye tracking software, including heat maps which display fixation density on a given image using a color gradient, as well as "bee swarm" videos which show fixation progression through time. These results will provide researchers with a more rigorous and cost-effective approach to analyzing eye tracking data.

DELETED OR UNUSABLE FILE RESTORATION TOOL: SNAPRESTORE
Andrew Garnder
Category: Engineering, Computer Science and Mathematics, Section 2
Poster #: 157
Location: Ballroom, 9:30 AM - 11:30 AM
Mentor(s): Greg Mason (High Performance Computing Center)

My research deals with other researcher's data. I have attempted to create a tool that allows users to recover files from snapshots taken by a frequently used file system, called ZFS (used by researchers at the High Performance Computing Center here at MSU). This would give users some minor security, as they would be able to restore deleted files, or even files that had been incorrectly edited, lost, or otherwise rendered unusable. Inexperienced users, or people unfamiliar with a command line interface will soon also have the option of a text-user-interface, where they will be able to select files in a 'Midnight Commander' style interface. I will present the outline the methods I used to parse for filenames and filepaths, error checking, and the test suite, written in a python library called distutils, that is being built to automatically test the software before installation, and close with an overview of the direction in which I hope to develop this software.

ENGINEERING AND OUTREACH: A SCANNING ELECTRON MICROSCOPE DEMONSTRATION DESIGNED FOR ELEMENTARY AND MIDDLE SCHOOL STUDENTS
Hayley Drozdowski
Category: Engineering, Computer Science and Mathematics, Section 2
Poster #: 158
Location: Ballroom, 9:30 AM - 11:30 AM
Mentor(s): Per Askeland (Composite Materials and Structures Center), Carl Boehlert (Chemical Engineering and Material Sciences)

When attempting to excite children about any academic field, providing them a hands-on experience that sparks their interest is key. Michigan State University's College of Engineering's Academic Outreach Program draws on this fact when presenting its impressive collection of facilities dedicated to research and discovery. This study attempts to expand on this idea by defining what elementary and middle school students are learning about in their science curriculum and then translating their classroom lessons into a hands-on demonstration. Moreover, the study will illustrate a presentation that is tailored to an outreach program for elementary and middle school students. The goal of such a presentation is to explain the inner-workings of a Scanning Electron Microscope while allowing students to learn more about a particular scientific subject they have been studying in school. Linking the educational outreach program with the current education that these students are receiving will illustrate the way their classroom studies are pertinent in the so-called "real world." Additionally, the students will gain a unique look into what the MSU College of Engineering has to offer, and will allow the students to perhaps envision themselves at such an institution. Ultimately, the goal of the study is to construct an outreach presentation that will encourage students to continue in their scientific studies, take initiative in their own scientific discovery outside of their classrooms, and aspire to higher scientific learning.

COMPOSITE MATERIALS
Albert Edwards Jr
Category: Engineering, Computer Science and Mathematics, Section 3
Poster #: 160
Location: Ballroom, 1:30 PM - 3:30 PM
Mentor(s): Lawrence Drzal (Composite Materials)

Exfoliated graphite nano-platelets (GnP) are a novel, affordable material developed at Michigan State University with excellent electrical conductivity and flexural strength. In order to take advantage of its unique properties, the GnP was fabricated into sheets of 'paper' with a simple water based process in which the thickness could be controlled over several microns. Papers of GnP mixed with chopped carbon fiber were manufactured for applications such as: composite reinforcement, battery electrodes, and thermoelectric devices. Pure GnP paper is fragile and can disintegrate easily. The chopped carbon fibers were added to strengthen the paper. The fibers and GnP are mixed with a polymer binder, poured into a floatation based paper making machine, and the resulting paper was removed for heating under pressure. The effect of fiber content, pressure, and temperature on the morphology, electrical, and thermal conductivity was examined. The ideal fiber loading would improve the integrity of paper without a significant loss of its electrical and thermal conductivity. The particle sizes and morphology of the paper were measured by Scanning Electron Microscopy (SEM). A Focused Ion Beam (FIB-SEM) was used to examine the sub-surface orientation and dispersion of the fibers and platelets.

ENHANCING THE PHYTOREMEDATION CAPABILITIES OF WETLAND PLANTS THROUGH TISSUE CULTURE INDUCED VARIATIONS
Alyse Waldhorn
Category: Engineering, Computer Science and Mathematics, Section 3
Poster #: 161
Location: Ballroom, 1:30 PM - 3:30 PM
Mentor(s): Dawn Reinhold (Biosystems and Agricultural Engineering)

Plant tissue culture utilizes culture techniques to segregate cells, tissues and organs in order to study isolated biological units. Traditionally, this technique has been employed to produce plants in the absence of seeds or pollinators, those that have a low chance of germination or growth, to aid in quick maturation and produce clones (Dodds, 1995). Increased use of personal care products, pharmaceuticals, hormones and pesticides has heightened the abundance of synthetic organic chemicals in the environment (Acero and Von Gunten, 2011). Many of these chemicals are endocrine disrupters which the Environmental Protection Agency has recently identified as contaminants of emerging concern. One available technology used to reduce these chemicals includes constructed treatment wetlands. Constructed treatment wetlands work well to efficiently phytoremediate surface and wastewaters, but additional practices to enhance wetland plants are needed. This project aims to determine the efficiency of tissue culture induced variations that enhance the phytoremediation capabilities of Lemna minor (duckweed) and Juncus effuses (common rush) when exposed to inhibitory concentrations of two organic pollutants, 3-fluorophenol and 3-trifluoromethylphenol. We hypothesize that during the callus culture phase of these plants, inhibitory concentrations of organic pollutants will produce calli that can be regenerated into plants with enhanced phytoremediation capabilities. Thus, the development of these wetland plants will increase the capabilities of constructed treatment wetlands to reclaim polluted waters, decreasing shortages of clean water for human use while improving ecosystem health.

POWERTOOLS: USER LEVEL TOOLS THAT IMPROVE RESEARCHER EXPERIENCE ON SHARED COMPUTING SYSTEMS
Joseph Greer
Category: Engineering, Computer Science and Mathematics, Section 3
Poster #: 162
Location: Ballroom, 1:30 PM - 3:30 PM
Mentor(s): Dirk Colbry (Institute For Cyber Enabled Research)

Powertools is a collection of software tools and examples that directly supports MSU researchers by allowing them to better utilize High Performance Computing (HPC) systems on campus. It was created to address the widespread problem of ad hoc and inefficient user support offered at many research universities. HPC users and system administrators often develop software solutions in the form of shortcuts, scripts and examples. For example, I have written a script called "connecttojob" that allows a user to directly connect to the compute node for a batch job they are running. This helps the user check on the job and debug any problems. Although extremely useful, it is difficult for other users to find these commands and understand how to use

them. Powertools addresses this by creating an environment that makes it easy to publish new software tools that solve common problems MSU researchers encounter. We have created a "powertools" command that searches the Powertools directory of tools and automatically generates a list of commands that are available to the user. These commands are grouped by functionality and if the user types "powertools commandname" the program will output a detailed message explaining that particular command. This documentation is generated directly from the scripts, allowing authors of a script to provide one file for both functionality and documentation. Future development of Powertools will include expanding the examples provided and creating a webpage that will allow outside users to download a version of Powertools that they can tailor to their specific systems.

VALIDATION OF SALMONELLA INACTIVATION DURING THERMAL PASTEURIZATION OF ALMONDS
Gretchen Merkel, Matthew Walch
Category: Engineering, Computer Science and Mathematics, Section 3
Poster #: 163
Location: Ballroom, 1:30 PM - 3:30 PM
Mentor(s): Michael James (Biosystems and Agricultural Engineering), Bradley Marks (Biosystems and Agricultural Engineering)

Dry food pasteurization is significantly affected by water activity (a_w) of the product, but few bacterial inactivation models account for this factor. Research is needed to quantify this effect, so that more accurate models can be developed. The present study compares experimental thermal inactivation of *Salmonella* on almonds at 0.65 a_w and 0.25 a_w with predictions by a modified inactivation model. Almonds are inoculated with *Salmonella* Enteritidis PT30 or *Enterococcus faecium* (NRRL B-2354) at ~10^8 CFU/g and equilibrated over salt solutions to a_w 0.25 or 0.65. The inoculated almonds are heated in a pilot-scale, moist-air impingement oven (121°C, 149°C, or 177°C; v_{air} = 2.7 m/s) at four dew points (< 33°C, 69°C, 81°C, or 90°C) to a target lethality of 4 log. Thereafter, surviving *Enterococcus* and *Salmonella* are enumerated (3 reps) by stomaching, diluting, and plating on de Man, Rogosa, and Sharpe agar or modified trypticase soy agar (35°C, 48 h), respectively. Almond surface temperatures are measured (9 reps) via surface thermocouples (T_{surf}) and aluminum almonds (T_{Al}), as a physical surrogate; these temperatures then are used to calculate *Salmonella* inactivation using a traditional log-linear model and a previously published modified model accounting for process humidity. The average log reduction values of the biological samples and predicted model values are evaluated. Data indicate that higher a_w samples (0.65 a_w) yield significantly greater log reductions compared to lower a_w (0.25 a_w) samples subjected to equivalent treatments, and that the modified model yields smaller errors than the traditional model.

VIRTUALIZATION OF COMPUTING CLUSTER DATA
Andrew Addis
Category: Engineering, Computer Science and Mathematics, Section 3
Poster #: 164
Location: Ballroom, 1:30 PM - 3:30 PM
Mentor(s): Andrew Keen (Institute for Cyber Enabled Research)

There are less than efficient tools for displaying computing systems data at MSU's High Performance Computing Center, (HPCC), in visual ways that users can interact with and understand easily. With the Challenger application users will be able to interact and analyze data pertaining to MSU's HPCC systems (clusters). Reading in XML data the application will draw objects in the room and display them in ways that users will be able to easily see differences in activity, such as processor load and active jobs. Using the Processing language I was able to create an application that is easily able to update the simulated representation of the room and its computing systems without needing to be refreshed or reset to force an update of displayed data. The data is displayed visually by color-coding different systems and by selecting specific systems users can get a numeric analysis of that system. This results in more user friendly and understandable display of data for MSU's High Performance Computing Center's users and staff. More importantly, it helps people who are curious about high performance computing clusters see what they look like and see graphical data about them.

OPTIMIZATION OF METHODS FOR RAPID DNA EXTRACTION AND RECOVERY
Rachel Kurzeja
Category: Engineering, Computer Science and Mathematics, Section 3
Poster #: 165
Location: Ballroom, 1:30 PM - 3:30 PM
Mentor(s): Evangelyn Alocilja (Biosystems and Agricultural Engineering), Michael Anderson (Biosystems and Agricultural Engineering)

Current methods for rapid detection and genetic identification of pathogenic microorganisms require a relatively pure DNA input. Common purification and recovery techniques are inefficient at low target concentrations, making pathogenic microorganisms difficult to detect at the low levels required for food and water safety. The procedure for rapid extraction and recovery of DNA was optimized by using existing techniques and varying different conditions for extraction of DNA. The optimized procedure reduces the time required for a test sample for pathogenic microorganisms from 18 – 24 hours, which is current FDA standard test time, to either 4 hours for the ethanol precipitation method, 2 hours for the Trizol method or 1.5 hours for the modified Trizol method, while still recovering significant amounts of DNA in each. These optimized procedures for rapid DNA extraction and recovery have important applications in medical diagnostic tests for disease detection and bacterial identification. Molecular genetic confirmation of pathogenicity is of utmost importance as over 70% of bacterial organisms are nonpathogenic and harmless. Specifically, these optimized methods of DNA extraction and recovery have been tested on E-Coli O157:H7, the second largest cause for food-borne contamination and fourth largest cause of infections by pathogen in the United States as of 2009.

B17 BOMBER INVESTIGATION
Isabel David
Category: Engineering, Computer Science and Mathematics, Section 3
Poster #: 166
Location: Ballroom, 1:30 PM - 3:30 PM
Mentor(s): Carl Boehlert (Chemical Engineering and Material ScienceS)

The object of this project is to establish whether 5 samples were part of a B17 bomber that crash landed during WWII. This project was initiated by Mr. Draggoo because his uncle was one of the pilots. My project is to complete a historical forensic investigation. The plane had been shot by German forces, incapacitating one of the engines and causing the crew to evacuate. Flying without a pilot for nearly 15 miles, the plane made a nearly perfect belly landing on some residential farm land. Mr. Draggoo made an effort to retrieve these pieces for historical value. These pieces range from a few centimeters to a large piece with the cross sectional area of around a half a meter. By carefully sectioning these pieces and mounting them in conductive epoxy, compositional and chemical analysis was conducted. Viewing 5 different samples under the Scanning Electron Microscope (SEM) has established some interesting microstructural detail and several Energy Dispersive Spectroscopy (EDS) reports. No conclusive findings have been made but I will continue to try and identify if these pieces are from the plane called Esquire.

EVALUATION OF STORAGE CONDITIONS ON MAGNETIC POLYANILINE NANOPARTICLES
John Mager
Category: Engineering, Computer Science and Mathematics, Section 3
Poster #: 167
Location: Ballroom, 1:30 PM - 3:30 PM
Mentor(s): Evangelyn Alocilja (Biosystems Engineering)

Polyaniline, an electrically active polymer, is becoming increasingly prevalent in nanotechnology for uses such as nanosensors and supercapacitators. It is particularly effective as a biosensor, as antibodies can be attached to the surface of the polymer. This study uses polyaniline coated iron oxide to form electrically active magnetic nanoparticles (EAMNPs) conjugated with surface antibodies. The antibodies capture pathogens, binding them to the magnetic particles, and allowing the pathogens to be magnetically separated from the rest of the sample. It has been found that, over time, the polymer will degrade, which inhibits adherence of the antibodies and influences conductivity. Without consistent chemical composition, the use and effectiveness of EAMNPs for commercial activities is inhibited. As the use of polyaniline increases, so does the importance of understanding the ideal storage conditions that maximize its functional lifespan. Using electrical conductivity and transmission

electron spectroscopy as parameters, the same batch of EAMNPs were tested at time zero and retested every two months under different storage conditions. Degradation in those parameters was studied, exploring the impact of exposure to oxygen and light on the polyaniline. Electrochemical conductivity was examined by cyclic voltammetry. In addition, physical form was analyzed by a transmission electron microscope. Preliminary findings include a slight increase in conductivity for all of the four combinations at a time frame of two months.

PRESSURE CALCULATIONS OF BESSEL VORTEX BEAMS

James MacVicar

Category: Engineering, Computer Science and Mathematics, Section 3
Poster #: 168
Location: Ballroom, 1:30 PM - 3:30 PM
Mentor(s): Robert McGough (Electrical and Computer Engineering)

A Bessel beam is a wave that has an amplitude that is expressed by a Bessel function of the first kind. Bessel beams have drawn significant attention in the field of optics and acoustics applications because they do not diffract or spread out as they propagate though space. They are also self-healing, meaning if the beam is partially obstructed at one point, it will reconstruct itself after a certain propagation distance. The higher-order Bessel beams are vortices, where the wave's amplitude vanishes and its phase is undefined. In an effort to evaluate the pressure field of a Bessel vortex beam, a two-dimensional array will be used in the FOCUS ultrasound simulator. The Bessel vortex beam is then conveyed in a coordinate system with an origin chosen at the center of the beam and the fast nearfield method is used for modeling the transient pressure field of the two-dimensional array. After deriving the excitation signal of the source wave, the Bessel vortex beam is used to calculate the nearfield pressure that can be used for imaging and it can then be shown that Bessel beams are truly non-diffracting.

Environmental Sciences and Natural Resources

Oral Presentations

WHAT'S THAT SMELL? NATIVE PREY AND THEIR RESPONSE TO CHEMICAL CUES PRODUCED BY THE INVASIVE PREDATOR BYTHOTREPHES
Emily Reed
Category: Environmental Science and Natural Resources, Section 1
Location: Parlor C, 9:00 AM
Mentor(s): Scott Peacor (Fisheries and Wildlife)

The study of predator-prey interactions is integral to ecology and understanding ecosystems. Prey individuals optimize their fitness if they accurately assess the level of predation risk in the environment and respond appropriately with the lowest energetic cost to themselves. One way for a species to gather information about risk in their surroundings is through chemical cues exuded from predators and predatory activity. This could involve examples such as alarm cues from other prey as they are consumed or cues given off as a predator digests prey. The more information an individual can glean from risk cues, the more accurately it can respond to predation risk. We ran laboratory experiments to study how the Great Lakes cladoceran Daphnia mendotae responds to risk cues involving the invasive predator Bythotrephes longiramus. Bythotrephes hunt Daphnia by sight and one way Daphnia attempt to escape predation is to migrate to deeper, darker water where they are less likely to be seen. We found the strongest vertical migration responses were elicited from cues produced by Bythotrephes that were not fed; with weaker responses to cues produced by Bythotrephes who had just consumed other Daphnia and by Bythotrephes digesting Daphnia or other prey species. These results suggest that Daphnia appears to have evolved a response specific to the presence of an invasive predator itself in only thirty years. These findings have implications in modeling food web interactions and when studying how native prey species will respond to the introduction of an invasive predator.

BIRDS OF PARADISE IN HELL
Shan Kothari
Category: Environmental Science and Natural Resources, Section 1
Location: Parlor C, 9:15 AM
Mentor(s): Joel Cracraft (Ornithology, American Museum of Natural History)

Despite extensive research into the influence of geology on the evolution New Guinea fauna, the complexity of the island's history has obscured the geological processes that cause genetic structuring. In this study, we examine the origins and phylogeography of the montane avifauna of the Central Cordillera of New Guinea using the King of Saxony Bird-of-paradise (Pteridophora alberti). Using about 2000 bp of DNA sequenced from ND2 and cyt-b in the mitochondrial genome, we show that, although the named subspecies of P. alberti are not well-supported, there is strong evidence of geographic structuring across the Central Cordillera. More thorough sampling may allow us to further elucidate this structure and make inferences about the geological history of New Guinea.

MULTI-SCALE ANALYSIS OF SPATIAL GENETIC DIVERSITY OF GREAT LAKES DEEPWATER SCULPIN (MYOXOCEPHALUS THOMPSONII)
Karen Beatty
Category: Environmental Science and Natural Resources, Section 1
Location: Parlor C, 9:30 AM
Mentor(s): Kim Scribner (Fisheries and Wildlife)

Over the past 50 years, population abundance and distribution of deepwater sculpin (Myoxocephalus thompsonii), a native fish species in the Great Lakes, has fluctuated greatly. Deepwater sculpin play an important ecological role in benthic Great Lakes communities, and are a food source for predatory fishes, such as lake trout (Salvelinus namaycush). Knowledge of sculpin dispersal at micro- and macro-geographic levels can allow scientists to effectively manage lakes with low abundance, and maintain levels of genetic diversity. The objective of my research was to assess genetic diversity within and among populations of deepwater sculpin throughout the Upper Great Lakes. Using DNA extracted from 600 individuals in fourteen populations

within Lakes Superior, Michigan, and Huron, I collected genotypic data and estimated allele frequencies at eleven microsatellite loci. Statistical analyses will indicate how genetic variation is distributed among individuals within a population, among populations within a lake, and among lakes. Patterns of spatial genetic variation will be used to evaluate the relative importance of historical vicariance versus localized gene flow among populations. I hypothesize that local population abundance or establishment of new populations result from either increased survival of existing populations nearby (Hypothesis 1), or colonization from individuals who migrate from more distant populations (Hypothesis 2). My conclusions can then be used to develop effective management plans for this species and Great Lakes fish communities.

EFFECTS OF BYTHOTREPHES PRESENCE ON LAKE MICHIGAN ZOOPLANKTON SPECIES INTERACTIONS
Matthew Bach
Category: Environmental Science and Natural Resources, Section 1
Location: Parlor C, 9:45 AM
Mentor(s): Scott Peacor (Limnology)

Invasive species can dramatically affect native species in a number of ways including direct competition for resources, or by giving another species a competitive advantage that would otherwise not exist in the invader's absence. The invasive predator Bythotrephes is believed to have adverse effects on key native zooplankton species in Lake Michigan such as Daphnia and diaptomid copepods. To understand how these species are responding to Bythotrephes I conducted an experiment to test how interspecific competition may be affected by the presence of Bythotrephes risk cues (water-borne chemicals emitted from the predator). I ran an experiment for ten weeks with assemblages of each of three key Lake Michigan zooplankton species (Daphnia mendotae, Leptodiaptomus ahslandi, and L. sicilis) competing for the same resources in the presence and absence of Bythotrephes cues. Results showed that Bythotrephes presence had a large effect on zooplankton survival. This may be because risk cues from Bythotrephes suppressed zooplankton feeding rates. Copepods survived better than Daphnia in all treatments, suggesting that they may be at a competitive advantage in both the presence and absence of Bythotrephes cues. Results also suggest that Bythotrephes presence alone can negatively affect zooplankton species even without consuming them. These findings have large implications for Great Lakes food webs. If Bythotrephes is causing native zooplankton to reduce feeding activity then Bythotrephes could be lowering the growth rates of these species. Thus, Bythotrephes could be having an indirect negative effect on fish species that rely on zooplankton for food during their larval stages.

COMPARISON OF OVERHEAD, DRIP, AND SUB-IRRIGATION FOR AN EXTENSIVE GREEN ROOF SYSTEM
Matthew Kolp
Category: Environmental Science and Natural Resources, Section 1
Location: Parlor C, 10:00 AM
Mentor(s): Brad Rowe (Horticulture)

Green roofs provide numerous economic and environmental benefits such as storm-water retention, energy conservation, and mitigation of the urban heat island. A major limiting factor to the success of any green roof, however, is soil moisture and the physical properties associated with the chosen media. Three common irrigation practices (overhead spray, drip and sub-irrigation) will be evaluated to determine the effectiveness of each application method. Three types of media and water retention fabric will also be analyzed. Modules with and without vegetation will be evaluated based on volumetric moisture content and water retention. Furthermore, the potential to calculate energy savings based on evapotranspirational cooling compared to air-conditioning may be possible, as well as other insight into irrigation techniques and practices for green roofs.

RECOVERING PARAMETERS OF METACOMMUNITY ASSEMBLY FROM PATTERNS OF PHYLOGENETIC DIVERSITY
Shan Kothari
Category: Environmental Science and Natural Resources, Section 1
Location: Parlor C, 10:15 AM
Mentor(s): Nathan Swenson (Plant Biology)

Using the output from digital simulations of ecological metacommunities, we examine several patterns regarding the spatial distribution of phylogenetic diversity under different conditions. We use the language R to analyze the statistical power of retrieving the parameters of metacommunity assembly from statistics summarizing the simulation output, such as phylogenetic signal and the rate of increase of phylogenetic diversity with area. Finally, we draw conclusions about the implications of these findings for conservation.

"THE KINGS OF FLINT" AND "AMERICA EATS TODAY"
Alyssa Firth
Category: Environmental Science and Natural Resources, Section 2
Location: MSU Room, 1:30 PM
Mentor(s): Geri Alumit Zeldes (Journalism)

Since my sophomore year, I've been part of a film crew that has documented the urban farming movement in Flint. In 2011, we debuted "The Kings of Flint" and "Flint Food Fighters." We will release this spring, the third and last film of our series: "Flint River Farm." In the meantime, I've edited a clip on another multi-media project called "America Eats Today." AET is a reprisal of "America Eats," a program created in the 1930s under President Franklin D. Roosevelt's Works Progress Administration. Roosevelt sent journalists out into the country to see what families were eating, where they were getting their food, and how they were paying for it. Seventy years later, I hope to document some of the same stories. In my presentation, I will share my story of Ardella Lee, an octogenarian and an urban farmer in Flint, who explains how she uses the vegetables that she grows to create chow-chow from a relish recipe created by her grandmother. I will also share some of the videos I've helped to create in the last year that have made its way into our documentary film series in Flint. These projects show how these urban farmers in Flint contribute to the environment, and how they use what's around them to live a healthy lifestyle.

HIGH TIMES AND DRY TIMES: CHANGES IN FLOW OF HAWAIIAN STREAMS WITH IMPLICATIONS TO HAWAII'S STREAM ORGANISMS
Alexandra David
Category: Environmental Science and Natural Resources, Section 2
Location: MSU Room, 1:45 PM
Mentor(s): Dana Infante (Fisheries and Wildlife), Yin-Phan Tsang (Fisheries and Wildlife)

Hawaii's streams support unique species of fish and shrimp that require access to ocean habitats for key parts of their life cycles. Because their migrations occur year-round, sufficient stream flows throughout the year are absolutely necessary to ensure their passage from ocean to river habitats. Recent evidence suggests, however, that precipitation events supporting stream flows are decreasing in frequency and intensity, a change first documented in the 1970s. This consequence of changing climate directly threatens Hawaii's endemic stream organisms. To better understand impacts of these climatic changes, I am using historical daily flow data from over fifty USGS-maintained stream gages located throughout Hawaii. For all data that fall into three distinct decades (current times (1990-2010), a time period where significant changes in precipitation were first characterized (1960-1980), and early century trends (1920-1940)), we have calculated a set of metrics that summarize the five main aspects of flow in Hawaiian streams: magnitude, timing, and duration of events; their annual frequency; and rate of change in extreme conditions. By characterizing how each of these metrics changes through time, we will summarize how changes in climate have affected stream flow regimes in the entire state and have led to differences among streams located on the five main islands of Hawaii. This information is of high value to managers responsible for balancing habitat needs of stream organisms with public demands for fresh water, and will lead to management strategies mutually beneficial to both stream biota and people.

UNDERSTANDING SOURCES FOR DISSOLVED CHLORIDE IN AN EASTERN MICHIGAN GROUNDWATER SYSTEM
Diana Brown
Category: Environmental Science and Natural Resources, Section 2
Location: MSU Room, 2:00 PM
Mentor(s): David Long (Geology)

No natural near-surface sources for Cl exist in the groundwater system of Allegan County, Michigan, yet elevated concentrations have been measured. The dissolution of NaCl from the application of road salt was hypothesized to account for the dissolved Cl. However, analysis of the data provided a more complex model. At low Cl concentrations, Cl/Na molar ratios span a wide range before trending to 1 (road salt), but at very high concentrations ratios trend above 1 (brine). A combination of anthropogenic and natural processes can account for these variations. The trends generated by ratios <1 can be modeled by mixing native groundwater with a saline end member. Ratios >1 also indicate mixing but the cause of the very high ratios at low Cl concentrations is unclear. Geochemical modeling indicates that these ratios can partially be related to ion exchange processes. Although the results are consistent with the road salt hypothesis, the addition of brines, either from upwelling processes or the brining of roads, contribute to Cl concentrations. If the brine is from upwelling, it might lead to further environmental concern as climate change alters groundwater dynamics. Finally, a positive correlation exists between Cl and Ca

concentrations indicating the possibility of increased dissolution of calcite as a function of increasing ionic strength. This could imply that human activity is degrading the aquifer in more ways then just contamination of Cl.

GENETIC LANDSCAPES: USING GENETIC DATA OF BOBCAT (LYNX RUFUS) TO DETERMINE POPULATIONS OF BOBCAT IN THE UP OF MICHIGAN

James Dupuie Jr

Category: Environmental Science and Natural Resources, Section 2
Location: MSU Room, 2:15 PM
Mentor(s): Kim Scribner (Fisheries and Wildlife)

For many species of ecological and economical importance, relatively little is known of their ecology. Increasingly, genetic data are being used to fill this information gap. For example, bobcat (Lynx rufus) is a secretive but imporant mesocarnivore throughout the species' native range, including Michigan. The objective of this study was to determine the number of genetic populations of bobcat in the UP of Michigan and whether physical landscape barriers such as roads, rivers, and lakes have significantly contributed to locations of genetic population boundaries. Tissue was collected from harvested bobcats at check stations between 2000 and 2004. A subset of samples (n=214) was selected representing the distribution of all samples throughout the UP. Samples were genotyped using eight microsatellite loci. Populations were identified based on degree of spatial heterogeneity in allele frequency. Locations of physical landscape barriers to gene flow were identified using GIS. Multiple genetic populations exist along an east to west axis across the UP. Individuals sampled in close proximity were more likely to be related than individuals sampled further apart. This effort will contribute to a larger project to determine how landscape barriers affect community composition and function for other co-distributed species in Michigan mammalian communities.

INVESTIGATING THE EFFICIENCY OF EXTRACTING DIESEL FUEL FROM WATER USING UNIVERIATE AND MULTIVARIATE CALIBRATION PROCEDURES

Johanna Smeekens

Category: Environmental Science and Natural Resources, Section 2
Location: MSU Room, 2:30 PM
Mentor(s): Ruth Smith (Criminal Justice)

The 2010 oil spill in the Gulf of Mexico again highlighted the importance of efficient remediation plans for fuel spills. This research investigates the efficiency of dichloromethane in extracting diesel fuel from water based on the concentration of diesel recovered. Initially, diesel standards were prepared and analyzed by gas chromatography-mass spectrometry (GC-MS). Then, to simulate environmental spills, diesel was deposited on water and extracted with dichloromethane. A total of ten spill samples were generated and also analyzed by GC-MS. Univariate calibration curves were prepared using characteristic compounds in the chromatograms of the standards. The bulk concentration of diesel recovered from each spill sample was quantified. Principal components regression (PCR) was also performed on the standards to create a multivariate calibration curve and used to quantify the diesel recovered from each spill sample. For both calibration procedures, the percent error in the concentration of diesel recovered from the spill samples and the expected concentration was calculated. For both procedures, more error was observed among early eluting compounds, which occurred as a result of their volatility and subsequent loss during the extraction procedure. Because there was little difference in percent error between the two procedures and since the multivariate procedure is less time consuming, that method is preferred over the univariate procedure. Ultimately, the methods in this project can be used to quantify diesel and characteristic compounds extracted from water when a fuel spill occurs to monitor degradation of the fuel and remediation procedures.

GOLDEN-WINGED WARBLER (VERMIVORA CHRYSOPTERA) DETECTION PROBABILITY ON POINT-COUNTS WITH AND WITHOUT PLAYBACK RECORDINGS

Darin McNeil

Category: Environmental Science and Natural Resources, Section 2
Location: MSU Room, 2:45 PM
Mentor(s): Gary Roloff (Fisheries and Wildlife)

The Golden-winged Warbler (*Vermivora chrysoptera*: GWWA) is a neotropical migratory passerine and listed as a "featured species" by the Michigan Department of Natural Resources. To manage rare species such as GWWA, it is important to develop effective sampling techniques for monitoring population trends. We conducted point counts in young (<8 years since harvest)

aspen stands to estimate detection probability of GWWA, with and without an electronic broadcast of a GWWA song (*i.e.* playback). We compared playback effectiveness for detecting GWWA for 50 meter radius and variable-radius point counts. We also assessed how GWWA detection probability changed temporally (June 1, 2011-July 1, 2011).Our analysis showed that the playback device increased GWWA detection probability by ≈ 259% and 25%, for 50m and variable radius point counts, respectively. We found moderate evidence that GWWA detection probability changed linearly throughout the sampling season; however, the direction of the relationship was different for the two point count distances; Point counts with a 50 meter radius showed a positive relationship with Julian date, while the variable radius point count showed a negative relationship. GWWA detection probability was always <1.0, regardless of sampling distance, date, or use of the playback device, which highlights the importance of accounting for imperfect detection within a modeling framework. Our results indicate that, under certain circumstances, the use of a playback device is an effective technique for improving detectability of GWWA, and potentially other rare species.

Poster Presentations

A HISTORY OF BEAVER ACTIVITY IN THE JORDAN RIVER WATERSHED: SPATIAL DISTRIBUTION, SUCCESSION, AND SEDIMENT
Briana Jasinski
Category: Environmental Science and Natural Resources, Section 1
Poster #: 170
Location: Parlor A, 9:30 AM - 11:30 AM
Mentor(s): David Hyndman (Geological Sciences), Anthony Kendall (Geological Sciences), Sherry Martin (Geological Sciences)

Beavers are exceptional environmental engineers, second only to humans in the modification of their environment. However, their historical response to changing habitat conditions is often difficult to classify due to lack of past spatial and population data. In this study, we demonstrate how combined aerial photo classification, GIS analysis, and in-field ground truthing can be used to model a rebounding beaver population previously decimated by the fur trade and habitat destruction in the Jordan River Watershed in northern Michigan. Aerial and high-resolution satellite imagery spanning the period 1938-2011 were digitized and georeferenced to map the fluctuating number of beaver dams in the watershed. By linking these dam counts with statewide beaver harvest estimates, we demonstrate that the GIS mapping provides a robust population estimate that can then be related to ecological, hydrological, and anthropogenic patterns throughout the region. Interesting relationships include the influence of post-logging ecological succession on prime beaver habitat, as well as the effect of slope, tributary class, and distance from roads on beaver dam placement and persistence. This study also lays the groundwork for estimating historical changes in downstream sediment flux and retention rates, which are important for understanding changes related to recreational use and fish habitat in the Jordan River. The compilation of this data will help paint a portrait of a 70 year period of beaver activity in a post-logging habitat.

EVALUATION OF THE LIGHT NUTRIENT HYPOTHESIS IN MICHIGAN STREAMS
Hannah Burke
Category: Environmental Science and Natural Resources, Section 1
Poster #: 171
Location: Parlor A, 9:30 AM - 11:30 AM
Mentor(s): Stephanie Miller (Zoology), Jan Stevenson (Zoology)

The light nutrient hypothesis (LNH) predicts that P concentration in algae changes with the availability of light and P. When light is high relative to P, algae shift away from biomass production and excrete C, reducing P concentrations, but when light is low relative to P, algae uptake P in excess to facilitate low light survival. We experimentally reduced light availability to glass slides and allowed biofilms to develop in 6 streams spanning a large P gradient. We compared P concentrations in biofilms where light was reduced to control biofilms and found mean P concentrations were higher when light was reduced compared to controls in each stream. The magnitude of mean stream differences did not increase with increasing P and instead was strongly correlated with streamwater N:P ratios (R2=0.92), indicating that as N availability increased relative to P, more dark P increase occurred. This result does not support the LNH and suggests that more uptake occurs when P limiting, possibly due to physiological N requirements for P uptake. In addition to this comparison, we wanted to evaluate how bacteria in biofilms would be affected by light. We found that mean bacterial production was higher in dark compared to light biofilms in 4/6 streams, this difference was related to streamwater N concentrations, with more light vs. dark production in higher N streams. Our data suggest that N availability can affect biofilm development and may need to be incorporated into existing hypotheses.

TWEETING SCIENCE
Andrew Hayes, Connor Teevens
Category: Environmental Science and Natural Resources, Section 1
Poster #: 172
Location: Parlor A, 9:30 AM - 11:30 AM
Mentor(s): Danita Brandt (Geology)

Scientists have struggled for hundreds of years to find the best means to inform the general population of their findings. It has become increasingly easier for scientists to connect with the public via social network such as twitter, Facebook, and blogs. Though each medium presents a unique opportunity for the distribution of scientific information, it is difficult to determine which medium or combination of media is the best option for scientists today. In this project, we attempt to bring scientific findings to the public in an understandable, interesting way. This project focuses mainly on twitter but has worked with groups focusing on Facebook and blogging.

INFLUENCES OF ORGANIC CARBON ON MICHIGAN STREAM ALGAL COMMUNITIES
Tricia Phelps
Category: Environmental Science and Natural Resources, Section 1
Poster #: 173
Location: Parlor A, 9:30 AM - 11:30 AM
Mentor(s): Stephanie Miller (Zoology), Robert Jan Stevenson (Zoology)

There has been an unprecedented, widespread increase in dissolved organic carbon (DOC) in the surface waters of glaciated landscapes. Although there are conflicting hypotheses on why DOC is increasing, understanding how aquatic communities are affected can help predict the impacts of this change. Because algae obtain C via photosynthesis, algal community responses to DOC has received minimal study, although some algae have been observed to uptake DOC, especially in low light conditions. We grew algal biofilms on substrates enriched in labile C (glucose) in 4 Michigan streams and compared algal communities on enriched substrates to unenriched control communities. In the two streams receiving lowest light, DOC had a significant effect on algal communities compared to controls (ANOSIM, p=0.03). In the two higher light streams, within-stream community similarity was significantly correlated to light, with higher similarity in higher light streams, suggesting low light was an important driver of DOC influences in these streams as well. In all streams, cyanobacteria were more abundant on DOC enriched substrata whereas diatoms in most genera as well as desmids, when present, were lower on DOC enriched substrates compared to controls. Overall, our results suggest that DOC can alter algal communities, perhaps due to direct use of organic C by certain taxa. More study on algal responses to DOC may help predict how DOC increases will alter the global C cycle.

ARE FEMALE FIELD CRICKETS LESS CHOOSY WHEN MATES ARE RARE?
Michael Chung, Sarah LoPresto
Category: Environmental Science and Natural Resources, Section 1
Poster #: 174
Location: Ballroom, 9:30 AM - 11:30 AM
Mentor(s): Robin Tinghitella (Kellog Biological Station)

Human impacts such as habitat fragmentation, introduction to new environments, and habitat destruction, may affect the mating behavior of a species because they decrease population size and, thus, reduce mate availability. House crickets, Acheta domesticus, are model organisms for the study of mate choice due to their rapid life cycle and the ease with which mating behavior is observed. Here, we ask whether low mate availability in A. domesticus will lead females to be more flexible or less choosy in their mating decisions. Female A. domesticus were assigned to one of three treatment containers: high density (30 individuals/unit area), low density (10 individuals/unit area), or housed individually. Females were allowed visual, acoustic, and tactile contact with males in these treatment containers, but were not allowed to mate. Courtship trials were conducted early and late in the life or each female. If mate availability impacts female mating choices, we expect females from the low density and individually housed treatments to have relaxed choosiness (higher mating rates or mating with males who have less desirable characteristics). The consequences include relaxed selection on male signals (such as cricket song and body size), rapid evolution in sexual signals, the loss of sexual signals, and even the loss of biodiversity due to hybridization.

COMMUNICATION APPROACHES TO PROMOTE ENERGY CONSERVATION
Kevin Adams
Category: Environmental Science and Natural Resources, Section 1
Poster #: 175
Location: Parlor A, 9:30 AM – 11:30 AM
Mentor(s): Michael Kaplowitz (Community, Agriculture, Recreation and Resource Studies)

Changing human behavior is seen as an important component of any effort to address the environmental challenges resulting from energy use. To effect behavioral change, potential participants needs to be among other things, aware of specific actions they can do as well as how effective their actions are at reducing energy use. However, little is known about how best to communicate this information to target groups and promote energy methods to conserve energy. Hence, as part of MSU campus sustainability efforts, this study was conducted to help guide communication efforts regarding energy conservation on campus. We used a mixed method approach to understand 1) approaches the will encourage respondents to conserve energy 2) usefulness of various information outlets and 3) the community's preferences for various information providers. Results from the web-survey (n=4083, RR=25.1) indicate that students embraced the idea of building-to-building competitions, whereas faculty and staff did not. Feedback on energy saved was important to all three groups, while mandatory education was not well received. Campus-email as a method of outreach was supported by all three as well. Lastly, staff and faculty enjoyed the idea of using unit heads to convey conservation information, but disliked using campus sports figures contrary to students' preferences. Our results suggest that communication efforts need to differentiate communication approaches based on target audiences and provide regular feedback on subjects' energy use.

FORESTS, FROGS, AND ROADS: IMPACTS OF ANTHROPOGENIC FORCES ON ANURAN COMMUNITY ASSEMBLAGES OF COASTAL VILLAGES IN NICARAGUA
Tim Muhich
Category: Environmental Science and Natural Resources, Section 1
Poster #: 176
Location: Parlor A, 9:30 AM - 11:30 AM
Mentor(s): Gerald Urquhart (Lyman Briggs, Fisheries and Wildlife)

Amphibians are greatly affected by the human impact on the world around them. Here we looked at the impact of the resulting effects of increased anthropogenic pressures on anuran community assemblages in four villages on the Atlantic coast of Nicaragua. Through call surveys of ponds, it was found that the level of anthropogenic pressure in a village was negatively correlated with anuran diversity, richness and abundance. Measurement of assemblage health was based on the Shannon-Weiner Diversity Index, species richness, and frog population levels. Impact was based on human population, distance from transportation networks, and community affluence (measured by boat motors owned). It was also found that the effects of these pressures were far greater on specialist species than on the assemblage as a whole.

CHANGES IN BLOOD HORMONE LEVELS AS A RESULT OF SEA LAMPREY PARASITISM ON LAKE TROUT (SAVELINUS NAMAYCUSH) FROM LAKE SUPERIOR
Karishma Chopra
Category: Environmental Science and Natural Resources, Section 2
Poster #: 180
Location: Ballroom, 1:30 PM - 3:30 PM
Mentor(s): Cheryl Murphy (Fisheries and Wildlife)

Sea lamprey parasitism has had devastating effects on lake trout populations, often killing their hosts. About 50% of lake trout survive sea lamprey attacks, yet there is very little information available about the survivors- are their physiological processes still intact? To address this question, we analyzed plasma concentrations of sex hormones of lake trout (Savelinus namaycush) to determine if sea lamprey parasitism affects the reproductive processes of lake trout. We tested whether parasitized and non-parasitized mature lake trout had different plasma levels of estradiol and testosterone. We developed a standard, using quantities of known radioactive testosterone and estradiol tracers marked with tritium to determine unknown, actual levels of hormones in plasma samples. The radioimmunoassay plasma protocol was conducted over a 5 day period and involved solvent extraction for separating estradiol and testosterone from the plasma samples, followed by column chromatography for distinguishing between dihydrotestosterone and testosterone. We found subtle differences in blood hormone levels of parasitized and non-parasitized lake trout, suggesting that further research is needed to determine if sea lamprey parasitism

alters reproduction in surviving lake trout. These findings could have implications for population-level processes; impairments in reproduction could lead to fewer eggs produced and potentially lead to population decline.

INTERACTIONS OF A MUTUALISTIC FUNGUS IN VIRALLY INFECTED PLANTS: DOES A MYCORRHIZA ALTER VIRUS SYMPTOMS?
Hayley Schebor
Category: Environmental Science and Natural Resources, Section 2
Poster #: 181
Location: Ballroom, 1:30 PM - 3:30 PM
Mentor(s): Carolyn Malmstrom (Plant Biology)

Many plants form a symbiotic relationship with arbuscular mycorrhizal fungi that involves a circular relationship of the fungus transferring mineral nutrients from the soil to the plant and the plant host providing carbohydrates to the fungus. In terms of grassland dynamics, arbuscular mycorrhizae can have an important influence. Another factor that can impact grasslands is viral pathogens. Considering the importance of understanding grassland ecosystems, virus-mycorrhizal interactions are a critical area to examine. In this study I asked how an annual grass, Soft Brome (Bromus hordeaceus ssp. hordeaceus), is affected when supporting both a mycorrhizal colonization (Glomus intraradices) and a Barley Yellow Dwarf Virus (BYDV) infection. BYDV is a widespread plant virus known to infect grass species vectored through phloem-feeding aphids with resulting stunted plant growth. A greenhouse study was set up with four treatments and 20 replicates in a completely randomized block design. The treatments were inoculated either with the mycorrhiza or heat-killed mycorrhiza and inoculated with BYDV through feeding by viruliferous aphids or no BYDV through feeding by non-viruliferous aphids. After 11 weeks, the plants were harvested and the shoot height, shoot weight, and the root system were measured as well as the presence of a mycorrhizal colonization. The BYDV infection produced a significant decrease in shoot height, shoot weight, and in the root system. The effect of the presence of a mycorrhizal colonization in both the BYDV treatments and the non-BYDV treatments will be presented and discussed.

EVOLUTIONARY EFFECTS OF NITROGEN DEPOSITION ON LEGUME RHIZOBIUM INTERACTIONS
Iniyan Ganesan
Category: Environmental Science and Natural Resources, Section 2
Poster #: 182
Location: Ballroom, 1:30 PM - 3:30 PM
Mentor(s): Jennifer Lau (Kellogg Biological Station)

Human activities are causing elevated rates of nitrogen (N) deposition, which have profound environmental consequences. The evolutionary consequences of N-deposition have been largely ignored, but are also predicted to be important, especially for resource mutualists, such as legumes and rhizobia, where N-deposition is predicted to select for less cooperative genotypes in both mutualists. Previous greenhouse work has shown that long term N-fertilization causes the evolution of less mutualistic rhizobia. Here we test whether these genetic changes in rhizobia influence legume traits and fitness in the wild. Rhizobia strains isolated from the Long Term Ecological Research site (LTER) T7 nitrogen treatment and control plots were used to inoculate three Trifolium species, which were transplanted in an old field plot within the LTER into six subplots. Half of the subplots were fertilized with the same concentration of ammonium nitrate as the original T7 plots where the rhizobia strains were originally isolated. Plants inoculated with rhizobia with high nitrogen history tended to produce less chlorophyll than those inoculated with strains from the control plots. As expected rhizobia nitrogen history had a significant effect on legume traits in the non-fertilized subplots, but not in the fertilized subplots, which is consistent with the evolution of less cooperative rhizobia and the driving role of N-abundance in this mutualist interaction.

RANK-RELATED STRESS IN A FISSION FUSION SOCIETY
Kaycee Morra, Katelyn Wagner
Category: Environmental Science and Natural Resources, Section 2
Poster #: 183
Location: Ballroom, 1:30 PM - 3:30 PM
Mentor(s): David Green (Zoology), Julia Greenberg (Zoology), Sarah Jones (Zoology)

While many social animals experience rank-related stress, its pattern and severity vary across species. Spotted hyenas (Crocuta crocuta) maintain a strict female-dominated hierarchy within their clans, and dominant individuals frequently aggress upon subordinates; despite this, there is no significant difference in stress levels between dominants and subordinates. We

hypothesize this is because spotted hyenas reside in permanent fission-fusion societies, whereby the clan is composed of highly transient subgroups, permitting lower ranking individuals to escape situations that could induce stress. However, spotted hyenas raise their young at communal dens, which are shared by high and low ranking females. We suggest that the need to nurse her cubs limits a subordinate mother's ability to avoid aggressive interactions with those of higher rank. Therefore, in order to assess whether there is a correlation between stress levels and rank when individuals are more restricted, we analyze the relationship between fecal glucocorticoid levels and rank in female hyenas with den-dwelling cubs. We predict that among den-restricted mothers, low-ranking hyenas experience more stress, as demonstrated by higher glucocorticoid levels, than high-ranking hyenas. The results of this study will increase our knowledge of the physiological consequences of rank in hyena societies and hyena denning strategies. Additionally, it may enable us to better understand how animals cope with the costs of social stress in order to reap the benefits of group living.

SOCIAL INFLUENCES ON COGNITION IN TWO SPECIES OF THREE-SPINED STICKLEBACKS
Ross Minter, Whitley Lehto
Category: Environmental Science and Natural Resources, Section 2
Poster #: 184
Location: Ballroom, 1:30 PM - 3:30 PM
Mentor(s): Jason Keagy (Zoology)

While foraging, organisms can limit their search time by picking up social cues provided to them by their peers. However, the extent to which organisms have evolved to use social information may depend on their degree of sociality. Different species of three-spined sticklebacks (Gasterosteus aculeatus spp) that vary in degree of sociality offer an excellent opportunity for investigating differences in capabilities to collect foraging information from conspecifics. In several different lakes in British Columbia, there has been repeated evolution of two species, limnetic (which are social) and benthic (which are solitary). In our experiment, one hungry female is isolated in the center of the tank while observing two groups of conspecifics foraging on opposite sides. One group is fed bloodworms every 1.5 minutes for 10 minutes, while the other group receives only water with bloodworm scent (Experiment 1) or bloodworms twice during the experiment (Experiment 2). We then test whether the observer can recognize that one patch is a better source of food after the two groups of conspecifics are removed. The social cognitive ability is assessed by the amount of time spent on the side of the tank that previously had the most food. We predict that limnetic sticklebacks will exhibit a greater ability to recognize feeding behaviors compared to the benthic species, due to their tendency to be more social. Our use of species pairs from multiple lakes gives us additional power to test this hypothesis. This study will give us insight into how sociality influences cognition.

EARTHWORM DECOMPOSTION IN THREE DIFFERENT LEAF SPECIES
Joshua Laske
Category: Environmental Science and Natural Resources, Section 2
Poster #: 185
Location: Ballroom, 1:30 PM - 3:30 PM
Mentor(s): Claire Moore (Ecology)

The agriculture industry is greatly affected by soil and its composition. Earthworm decomposition influences how nutritious the soil and if more was known about earthworm decomposition it could affect the food industry. We are studying whether or not earthworms decompose certain types of leaf litter at different rates. If certain species of leaves are decomposed more quickly, than it would mean that nutrients could be added to soil more quickly when earthworms decompose certain types of litter. There will be three species of leaves in separate containers, and the mass of the remaining litter will be measured three times a week for three weeks to account for decomposition. This will be replicated three times (three containers for each leaf species) to ensure that the results are accurate and to eliminate confounding factors. The decomposition rates will then be compared to see if there are any significant differences in the rates of decomposition. If there are it could have profound implications for farms and other food producers.

PREDICTING THE IMPACTS OF CLIMATE CHANGE ON AGRICULTURAL YIELDS IN THE MAUMEE RIVER WATERSHED
Ryan Nagelkirk
Category: Environmental Science and Natural Resources, Section 2
Poster #: 186
Location: Ballroom, 1:30 PM - 3:30 PM

Mentor(s): Bruno Basso (Crop Systems, Forestry and Environmental Sciences), David Hyndman (Geological Sciences), Anthony Kendall (Geological Sciences)

Climate change is likely to have considerable effects on agriculture in the Midwestern United States. Under current climate projections, end-of-century temperatures rise as much as 5ºC (9ºF), while precipitation stays relatively unchanged despite a concurrent increase in heavy rainfall events. These trends have already been observed over the last century: rising temperatures have extended the growing season 2 days per decade and heavy rainfall events have become twice as common. In an effort to understand the effects of climate change on agriculture, maize and soybean yields in the Maumee River Watershed will be simulated using the Systems Approach to Land Use Sustainability (SALUS) crop model. SALUS calculates daily crop growth in response to changing climate, soil, and management conditions. It is hypothesized that 1) despite any positive effects of CO2 fertilization and allowing for higher yielding varieties, longer and warmer growing seasons will lead to excessive water- and heat-stress, lowering yields overall under current management practices, and 2) that growing maize and soybeans successively in the same season to offset these losses may become feasible if sufficient late-season soil moisture is made available.

ANTHROPOGENIC INFLUENCE ON LION POPULATIONS IN THE MASAI MARA NATIONAL RESERVE OF KENYA
Jenna Parker
Category: Environmental Science and Natural Resources, Section 2
Poster #: 187
Location: Parlor A, 1:30 PM - 3:30 PM
Mentor(s): Kay Holekamp (Zoology)

Anthropogenic disturbances such as habitat destruction, retaliatory killings and climate change are known to adversely affect large carnivore populations. In many areas of Africa, it is believed that these influences are contributing to the steep decline of the African lion (Panthera leo). The Masai Mara National Reserve of Kenya offers a great opportunity to study the effects of human disturbance on large carnivores; one side of the reserve is virtually unaffected by surrounding settlements, and the other flanked by Maasai pastoralists who use the park daily for grazing livestock. We identified individual lions for a total of two months within the Masai Mara Reserve, recording resightings for mark-recapture analysis. We plan to use Bayesian statistics under a spatially explicit mark-recapture framework to estimate and compare the number and spatial distribution of lions on each side. Through this comparison, we can estimate the degree to which anthropogenic disturbance is affecting the population of lions within the reserve.

GREAT LAKES ECHO
Alethia Kasben
Category: Environmental Science and Natural Resources, Section 3
Poster #: 190
Location: Ballroom, 1:30 PM - 3:30 PM
Mentor(s): David Poulson (Journalism)

Great Lakes Echo is an online news site; the goals of the site are to provide information about environmental issues to a variety of audiences in the eight very different Great Lake states. I have worked to produce articles through interviews, research and journal articles to help better inform my publics about important studies being done in their regions. I also have worked on creating Great Lake “memes” and facebook quizzes to better interact with my audiences. The results being a better informed audience who is also entertained enough to read the entire article, comment on it and come back to the site to read more stories. I have written about the first plastic study being done in the Great Lakes, a study showing there is more algae in Lake Erie during the wintertime than previously thought and also about how Wisconsin is not the mitten state, no matter what they say.

IMPROVEMENT OF LINERBOARD PROPERTIES THROUGH COATING MADE OF BIODEGRADABLE AGRICULTURE PRODUCTS
Steven Jackson
Category: Environmental Science and Natural Resources, Section 3
Poster #: 191
Location: Ballroom, 1:30 PM - 3:30 PM
Mentor(s): Pascal Kamdem (School of Packaging)

Linerboard is the most common type of paper that is produced today. It is used for many different applications, but mostly in the production of corrugated boxes and displays. In some cases, the linerboard is coated with various films to achieve waterproofing or enhance other properties of the paper. These coatings may be made of anything from wax to polyethylene. Although this may provide desirable properties to the linerboard, it also hinders the biodegradable and recyclable advantages of linerboard that make it such a sustainable material. If a biodegradable coating can be applied to linerboard, while increasing properties such as tensile strength, burst strength and water and gas barriers, it would be a great alternative to non-sustainable coatings. The purpose of this research project is to determine whether linerboard coated with a biodegradable film will affect its properties. The linerboard paper was coated with a biodegradable emulsion containing micronized sugar beet pulp, chitosan, glycerol, linseed oil, glutaraldehyde and citric acid. Upon drying, the resulting composite made of a bi-layer was tested for tensile strength, burst index, tear index, water vapor, rigidity and water absorption. The results will be presented and discussed in terms of the effect of the coating on the linerboard properties. I predict that the biodegradable coating will increase the properties tested for linerboard.

CONTINUED REPRODUCTIVE SEASONALITY IN AN EQUATORIAL CARNIVORE, THE SPOTTED HYENA, DESPITE CHANGES IN FOOD AVAILABILITY
Wesley Binder
Category: Environmental Science and Natural Resources, Section 3
Poster #: 192
Location: Ballroom, 1:30 PM - 3:30 PM
Mentor(s): David Green (Zoology)

Reproductive seasonality has been documented across several different taxa, and this behavior is often associated with temporal variations in food availability. In Kenya, several large carnivores are subject to these changes in food availability when hundreds of thousands of wildebeest and zebra make their annual migration from the Serengeti to feed in the Masai Mara National Reserve. This temporary increase in the food available to resident spotted hyenas (Crocuta crocuta) in the Reserve shows an adaptation of hyena reproduction timed to best take advantage of this annual influx of available prey. In 1999, Holekamp et al. found that conception rates were higher during the migration months, thought to be due to the increased availability of nutrients needed for reproduction. Although the number of migrating animals has remained relatively constant over the last twenty-two years, the amount of time that these migrating animals have spent in certain areas within the Reserve has decreased due to indirect effects of pastoralist activities. Here, we examine the effects of this altered migration pattern on spotted hyenas by monitoring changes in birth dates, conceptions, and dates of juvenile weaning during changing migration patterns. Despite changes in the duration of wildebeest grazing in the Reserve, spotted hyenas still exhibited the same reproductive seasonality that had been previously observed. These finding demonstrate an example of the behavioral plasticity exhibited by spotted hyenas that has led them to be the most abundant large carnivore on the African continent.

HABITAT'S EFFECTS ON FEMALE MATE CHOICE
Alex Fox
Category: Environmental Science and Natural Resources, Section 3
Poster #: 193
Location: Ballroom, 1:30 PM - 3:30 PM
Mentor(s): Alycia Lackey (Zoology)

There are many examples where habitat loss has caused the extinction of a species. Therefore, habitats can play an important role in the preservation of a species. In the stickleback fish (Gasterosteus aculeatus), two species, limnetics and benthics, mate in different habitats. Limnetic fish mate in the open habitats while benthic fish mate in the vegetation. After an invasive species of crayfish was introduced into Enos Lake the vegetated habitat benthics prefer was decimated, and mating between benthic and limnetic species (i.e., hybridization) increased dramatically. This experiment tests whether habitat loss could promote hybridization by altering the way females assess prospective mates. We presented females with a choice between a male of both species. Males were either in the "right" habitats, the limnetic in the open and the benthic in the vegetation, the "wrong"

habitats with males in the opposite habitats, or the males were both in open habitats, simulating Enos Lake's environment. If habitat does play a part in females mate choice, then they should be most likely to select males of their own species when those males are in the "right" habitat rather than when those males are presented in the "wrong" or open habitats. The results of this work can inform conservation efforts and determine whether it is important to eliminate the crayfish and restore the vegetation to stop the hybridization. In a broader sense this study highlights the importance of ecosystem conservation and the need for habitats to be protected.

WHAT YOU DIDN'T KNOW ABOUT POLLEN, AND WHY IT KEEPS STICKING AROUND?
Jacob Mell
Category: Environmental Science and Natural Resources, Section 3
Poster #: 195
Location: Ballroom, 1:30 PM - 3:30 PM
Mentor(s): Carl Boehlert (Chemical Engineering and Material Science)

This study elaborates on different techniques and forms of adherence that is utilized by different types of pollen. Imaging will be provided courtesy of Scanning Electron Microscopy (SEM) in order to visualize and understand pollen attachment characteristics. Samples used were decorative flowers such as carnations, daisies, and lilies that are well known and commonly used in the process of pollination. After preparing them with a plant press and process in the SEM laboratory, the samples were then inserted into the SEM chamber to be photographed at a microscopic level. Pictures show the characteristics of pollen range from spiky protrusions on different pollen that enables it to attach easier while others display a coarse uneven surface that would also aid pollination processes. This research may help further understand how pollen is transported and it's irritable allergenic properties.

MICRO-SCALE STRUCTURE AS A FACTOR IN SEASONAL PLANT SURVIVAL
Eric Aleman, Vamsi Chinta
Category: Environmental Science and Natural Resources, Section 3
Poster #: 196
Location: Ballroom, 1:30 PM - 3:30 PM
Mentor(s): Carl Boehlert (Chemical Engineering and Materials Science)

We will be comparing the micro-scale structural differences of two different plant species in order to study the structural effects in seasonal plant survival. Michigan has some common species of plants that usually thrive in the winter and others that usually die. However, due to the peculiar weather this winter many species have managed to survive that otherwise wouldn't have. While there are structural, chemical, and environmental factors at play, we would like to determine the relative importance of structural differences in determining plant survival. We plan to use samples of two plant species within the same family, using species that are common to Michigan with one that would commonly die and the other that would commonly survive. We will use a Scanning Electron Microscope to image the samples, using secondary electron imaging to study the micro-scale structural differences between the species. We will use samples of roots, stems, and leaves. We hope to measure a qualitative difference in the size and abundance of specific organelles between the species. This would give evidence as to what physical factors are important in helping plants survive cold winters. If we do not see a qualitative difference between the samples this will suggest that chemical and environmental factors are the primary determinant in seasonal plant survival. Either result will provide information on why certain species can survive mild winters but not cold winters. We plan to submit one poster for each of the two plants, so there will be two distinct posters.

Health, Food, and Wellness

Poster Presentations

IMPROVING PHYSICAL ACTIVITY MOTIVATION IN FREE-LIVING CONDITIONS: AN EXAMINATION OF THE KOHLER MOTIV
Nathan Keniston, James Ruble, Sara Sherman, Nick Thompson
Category: Health, Food and Wellness, Section 1
Poster #: 200
Location: Ballroom, 9:30 AM - 11:30 AM
Mentor(s): Brandon Irwin (Kinesiology)

The purpose of this study was to examine the efficacy of Kohler motivation gain principles (i.e. indispensability, social comparison) in increasing physical activity under free-living conditions. This field experiment employed a 2 (gender) x 3 (condition: individual, coactive, conjunctive) experimental design. After a 1-week assessment of baseline habitual physical activity (using Sensewear Armband monitors, expressed as energy expenditure), participants went through a brief orientation in the lab where they learned safe strategies for increasing their physical activity, appropriate for participant readiness for change (Marcus, Banspach et al., 1992). After the orientation, participants were randomly assigned to one of the three conditions and their task was to increase their physical activity over a 7-week period. All subjects received performance feedback on their energy expenditure each week. Participants in the partner conditions also received performance feedback on their partner's energy expenditure, which was manipulated to be always greater (40%) than their own. This experiment was a logical extension of previous motivation gain research, and was well positioned to inform motivational practices for increasing physical activity. Results on this study are pending.

ASSOCIATIONS BETWEEN STEPS PER DAY, ENERGY EXPENDITURE, AND BIRTH WEIGHT
Alaina Vince
Category: Health, Food and Wellness, Section 1
Poster #: 201
Location: Ballroom, 9:30 AM - 11:30 AM
Mentor(s): James Pivarnik (Kinesiology)

Before the 1980's, exercise during pregnancy was rarely studied and its effect on the maternal-fetal unit (including birth weight [BW]) was unknown. Recent research has shown that structured exercise and other physical activity (PA) throughout gestation do not appear to negatively affect BW. However, results have been mixed in terms of the extent of any BW alterations related to PA. The mixed results are likely in part due to the quality and type of PA measurement modalities that have been used. The purposes of this study were to 1) examine the agreement of two measurement instruments: the Omron Pedometer (HJ-720IT) and SenseWear Armband during pregnancy, and 2) examine the associations among steps per day, energy expenditure (EE), and BW. Participants were recruited prior to 20 weeks gestation and considered low-risk by their health care providers. Women wore the Omron Pedometer and SenseWear Armband for one week at home at 20 weeks and 32 weeks gestation. The Omron Pedometer measured steps per day, and the SenseWear Armband measured EE in kcals. Results from the two PA measurement devices were correlated with one another and with BW. Weak-to-moderate correlation coefficients were found between steps per day and EE (r=0.38-0.42). Although this is an ongoing study, preliminary data indicate that PA and EE in the second and third trimesters are negatively correlated with BW. Further research is needed to validate the use of these instruments during pregnancy in order to accurately determine the relationship between PA/EE and pregnancy outcomes.

LISTERIA MONOCYTOGENES TRANSFER DURING MECHANICAL DICING OF CELERY AND GROWTH DURING SUBSEQUENT STORAGE
Chelsea Kaminski
Category: Health, Food and Wellness, Section 1
Poster #: 202
Location: Ballroom, 9:30 AM - 11:30 AM
Mentor(s): Elliot Ryser (Food Science and Human Nutrition)

During January to October 2010, 10 listeriosis cases, including 5 deaths, were traced to commercially diced celery from Texas. In response to this outbreak, *Listeria monocytogenes* transfer was assessed during mechanical dicing of celery along with growth

of this pathogen in diced celery during 7 days of refrigerated storage. In each of three experiments, retail celery stalks were inoculated with *L. monocytogenes*. This batch of inoculated celery was diced using a Hand-Operated Easy Dicer Food Cutter followed by 15 identical batches of uninoculated celery. Each batch of diced celery was then evenly divided and transferred to three sterile bags that were examined for numbers of *Listeria* after 3 and 7 days of storage at 4, 7, and 10°C. Additionally, the percent of inoculated product transferred to each batch of uninoculated celery was determined using the red stems of Swiss chard as a surrogate, with the weight of Swiss chard determined in each batch of diced celery. Results showed that *L. monocytogenes* transferred from the initial batch of inoculated celery to all 15 batches of uninoculated celery during dicing. At 10°C*, Listeria* grew an average population of 3.39 log CFU/g. Fewer batches of celery showed significant growth during storage at 4 and 7°C ($P < 0.05$). Swiss chard was recovered from all 15 batches with similar amounts seen in batches 4 to 15 ($P > 0.05$). When stored for 7 days at 4, 7, and 10°C, *L. monocytogenes* populations on celery increased 0.14, 0.59, and 2.02 log CFU/g, respectively.

INTERPRETATIONS OF PATIENT NARRATIVES OF CO-MORBID CHRONIC ILLNESS DIAGNOSES
Jessica Wright
Category: Health, Food and Wellness, Section 1
Poster #: 203
Location: Ballroom, 9:30 AM - 11:30 AM
Mentor(s): Linda Hunt (Anthropology)

Co-morbidity, or the presence of coexisting medical diseases in addition to a primary diagnosis, can influence a patient's understanding and management of their health experience. Chronic illness co-morbidity is a theme of major concern among scholars, medical professionals, and affected patients. Literature in the field discusses factors influencing co-morbidity with a focus on shifting diagnostic criteria, pharmaceutical interaction on symptomatology, and patient lifestyle. This research is focused on the patient's experience and interpretation surrounding the reception of their co-morbid diagnoses. Qualitative research techniques, including interviews and observations, were used to investigate both patient and clinician perceptions of chronic illness management. Analyzing the narratives of a subsample of patients having a diagnosis of both Diabetes mellitus (DM) and Hypertension (HTN) served to illuminate how these patients understood their diagnosis in the larger frame of their illness experience. This data identifies a trend of diagnoses at a point of crisis. Many crises, such as loss of a loved one, involvement in auto accidents, and hospitalizations, were discussed by patients as having a relationship to the time of their co-morbid diagnoses. This analysis explores the concept of a cascade framework to interpret these diagnostic patterns. It will also suggest that co-morbidity is initiated not only by circumstances occurring in the pathological or pharmaceutical realm of a patient's experience but also within larger social and structural realms.

HARNESSING THE KOHLER EFFECT TO INCREASE MOTIVATION OVER REPEATED TRIALS OF AEROBIC EXERCISE
Rebecca Ruch, Maxine Goryoka, Rachael Nolin
Category: Health, Food and Wellness, Section 1
Poster #: 204
Location: Ballroom, 9:30 AM - 11:30 AM
Mentor(s): Brandon Irwin (Kinesiology)

The present investigation examined the Köhler motivation gain effect in a health game using an absent partner, presented virtually. The Köhler effect occurs when an inferior team member performs a taxing task better in a team or coaction situation than one would expect from knowledge of his/her individual performance. The effect has been strongest in conjunctive task conditions where the group's potential productivity is equal to the productivity of its least capable member. Participants were randomly assigned to one of four conditions (non-exercise control, individual control, coaction, and conjunctive) in a 4 (conditions) x 2 (gender) factorial design and performed eight bouts of an aerobic exercise video game over the course of a 4-week period. They performed the first trial of a combat-style game for as long as they could, and after at least a 2-day rest period, those in the partner conditions were told they would do remaining trials with a same-sex virtual partner whom they could observe during their performance. The partner's performance was manipulated to be always superior to the participant's. Preliminary results show that the expected differences in performance between groups did not exist, likely due to methodological limitations. These limitations, as well as psychosocial outcomes and directions for future research will be discussed.

EXPLORING EFFECTS OF CHOLESTEROL LOWERING MEDICATIONS ON MUSCLE FUNCTION
Ananya Juneja
Category: Health, Food and Wellness, Section 2
Poster #: 210
Location: Gold Room, 1:30 PM - 3:30 PM
Mentor(s): Jill Slade (Radiology)

A large number of individuals are on cholesterol lowering medications. One class of these drugs are statins, in which HMG-CoA reductase is inhibited. This enzyme is involved in the early steps of cholesterol biosynthesis. Since over half of the elderly population use statins, potential untoward effects should be investigated. In particular, a small proportion of people using statins have reported muscle related problems, although the explanation for muscle pain is unclear. Because of the biochemical pathway these drugs interfere with, a number of possible muscle impairments may result. To test the effects of statins on skeletal muscle, muscle damage, muscle strength and muscle pain was measured in individuals before and during statin use. Twenty-three healthy individuals were placed on a high dosage of atorvastatin calcium, a commonly prescribed statin, and tested both with MRI and exercise testing before and during statin use over a 6 week time period. Six subjects were unable to complete the study, one of them from muscle pain and paresthesia. A main goal of this study was to track muscle soreness and pain over time. The testing included evaluating muscle damage before and after statin use. In addition, maximum voluntary contraction strength (MVC) was measured over the entire period before and during statin use for the elbow flexor, hip flexor, knee extensor and handgrip muscles. These studies may help us understand the effects of statins on skeletal muscle.

INDIAN NUTRITION SUPPLEMENTATION PROGRAMS AND THEIR IMPACT ON THE COMMUNITY
Amanda Feighner
Category: Health, Food and Wellness, Section 2
Poster #: 211
Location: Gold Room, 1:30 PM - 3:30 PM
Mentor(s): Dan Dutkiewicz (Institute of International Agriculture), Deepa Thiagarajan (Food Science and Human Nutrition)

Childhood malnutrition in India is a serious issue that leads to premature death, increased susceptibility of disease, and compromised educational attainment. One nongovernmental organization working to combat the issue of childhood malnutrition is Shanti Ashram in the Coimbatore region of Tamil Nadu, India. The Bala Shanti program is one service area of Shanti Ashram which provides a pre-school education and critical nutrition supplementation to 3 to 5 year olds in vulnerable rural areas and has additional programs to educate parents. This study partnered with the Bala Shanti program to examine 1) how effectively the mothers of children in the program, teachers, and graduates are learning about nutrition; 2) how effectively this knowledge is being shared by mothers, teachers, and graduates to create a positive impact in the community; and 3) how to identify gaps in programming, including assessment, nutrition, education, and knowledge transfer. Research was conducted using interview-based surveys with mothers, teachers, and graduates of the program in for 3 weeks in Coimbatore. Results from the surveys in addition to suggestions to fill programming gaps will be presented. It was concluded that the Bala Shanti program reaches beyond the parents and children directly involved, and it is hoped that this study can leverage additional support for the Bala Shanti program.

VACCINES: MISCONCEPTIONS REVEALED
Rachel Dee, Beverly Bell, Molly Brown, Cassandra Martin
Category: Health, Food and Wellness, Section 2
Poster #: 212
Location: Gold Room, 1:30 PM - 3:30 PM
Mentor(s): Ryan Sweeder (Chemistry)

Vaccines are a very controversial topic in American society. Praised by many and criticized by others, the facts often get lost in the chaos, creating confusion in the general population. Despite the fact that science has disproved many misconceptions, anti-vaccine media and pundits have appeared on television and the internet, and the anecdotes that they present strongly resonate with parents, often influencing their decisions. Because college students are beginning to make vaccination decisions for themselves and may soon be making them for their children, the purpose of this study was to identify which of the common misconceptions, as listed by the Centers for Disease Control (CDC), were most prevalent among college-aged students and to try to facilitate critical thinking about the legitimacy of their beliefs. To accomplish this, an online survey was distributed and personal interviews were conducted with both students and professionals involved in the vaccine field. It was found that many of the misconceptions are quite prevalent among college students, both science and non-science majors, even though over 90

percent of respondents said they trusted their doctor most for vaccine safety information. Additionally, if a student held the misconception that vaccines are linked to autism, they often held several of the other misconceptions as well. Utilizing the power of social media, a website with valid information about vaccine safety and a series of YouTube videos were created to counter these misconceptions.

IDENTIFYING PHYSICAL ACTIVITY USING A WEARABLE WIRELESS NETWORK
Margaux Hetzman
Category: Health, Food and Wellness, Section 2
Poster #: 213
Location: Gold Room, 1:30 PM - 3:30 PM
Mentor(s): Karin Pfeiffer (Kinesiology)

A common way of estimating energy expenditure (EE) in physical activity studies is through the use of commercially available accelerometers. One major limitation of a single accelerometer is the inability to accurately predict EE during physical activities that involve limited vertical displacement, such as weightlifting or bicycling. However, a system that could determine activity type could help researchers more accurately estimate EE. The three primary aims of this project were to 1) design a wearable wireless network of accelerometers and algorithms that could recognize various lifestyle activities, 2) test the accuracy with which the network predicted each activity, and 3) compare EE predicted by the network to a commercially available accelerometer and actual EE measured via indirect calorimetry. The current study focused on Aim 2. 10 pilot participants wore the wireless network while completing five minutes of 14 different activities (lying down, sitting (reclined/straight), standing, biceps curls, biking (fast/slow), jogging, jumping jacks, walking (fast/slow), squatting, sweeping, and stair climbing). The network's detection accuracy was calculated based on the percentage of the time it correctly identified the activity being performed. The network predicted the static and dynamic activities with 100% and 84-100% accuracy, respectively for a total detection accuracy of 95.2%. The wearable wireless network was able to classify 14 lifestyle activities with high accuracy in the pilot participants. Future directions include validating the system in a larger group of participants and comparing data obtained from the wireless network to currently available accelerometers.

THE ANATOMY OF THE TOOTH AND TOOTH DECAY
Daniel Pickard
Category: Health, Food and Wellness, Section 2
Poster #: 214
Location: Gold Room, 1:30 PM - 3:30 PM
Mentor(s): Carl Boehlert (Chemical Engineering and Materials Science)

Tooth decay is a prevalent issue in society. An improved understanding of the anatomical structure of the tooth can provide new insight in terms of prevention and care. The Scanning Electron Microscope (SEM) is capable of capturing extremely detailed and high magnification images of objects through utilization of an electron beam mechanism. Altering settings and specifications of the microscope can lead to a variety of image types that allow for close examination of all components of an object. This technology will be implemented in this study to capture images that allow for general structural understanding and in addition visually represent how structural changes may cause and come with disease. Comparing high resolution images of both healthy and diseased teeth can help us to understand and make conclusions about the specific structural changes that have actually taken place in the tooth and can help make prevention and care as specific and as efficient as possible.

History, Political Science, and Economics

Oral Presentations

"EVERYBODY HAD TO HAVE SOMEONE": THE ISSUE OF RELATIONSHIPS AMONG MEN AND BOYS ON A TRANSPORT FROM AUSCHWITZ TO BUCHENWALD
Justine Brunett
Category: History, Political Science and Economics, Section 1
Location: MSU Room, 9:00 AM
Mentor(s): Kenneth Waltzer (Jewish Studies)

In Women in the Holocaust, Dalia Ofer, like many writers of gendered Holocaust literature, asserts that women exhibited a greater "willingness to establish relations with others for mutual aid" in the Nazi camps than their male counterparts (305). Joy Erlichman Miller in Love Carried Me Home reaffirms this claim by quoting a survivor who said, "Women…have motherly instincts, friend instincts more…That's what was holding the women together because everybody had to have someone to lean on...The men, no…the men didn't do that" (190). Scholars like Lois Pine, however, suggest women report incidents of mutual support in their testimonies more than men because they "were socialized to cherish relationships," but men may have formed relationships just as frequently (133). My examination of Nazi records of youths on an all-male transport that arrived January 26, 1945, at Auschwitz from Buchenwald—the transport that carried Elie Wiesel—supports Pine's view by demonstrating that men and boys formed and maintained cluster relationships as well. Initially sent to Auschwitz-Birkenau and then to Buna (Auschwitz III), these youths were transported to Gleiwitz and ultimately to Buchenwald as the Soviets advanced toward Auschwitz. Of 304 boys on the transport born after 1927, 25% were clearly clustered with family and friends, typically in small groups. Some clusters disbanded or formed at different times in the camps and transports, but some exhibited astonishing continuity. Each cluster suggests that while women may have relied upon relationships to survive in the Nazi camps, men and boys did too.

PRIVATE DIPLOMACY: PRINCE METTERNICH AND THE DUCHESS OF SAGAN AT THE CONGRESS OF VIENNA
Kristine Cooney
Category: History, Political Science and Economics, Section 1
Location: MSU Room, 9:15 AM
Mentor(s): Malcolm Magee (History)

Regarding the Congress of Vienna of 1814, several questions arise about European society and the role of women in the diplomatic process. First, what were the cultural changes in Europe effecting women after the French Revolution and the Napoleonic Wars? Second, how did the role of women change as a result of the cultural changes? Delving deeper into the private affairs of the major diplomats present in Vienna, the personal affairs of individuals seemed to provide evidence this societal change. Of particular interest in this regard is the relationship between Prince Metternich and the Duchess of Sagan, who carried on one of the major affairs during the Congress. Three specific issues are addressed in this article. First, was the affair between Metternich and the Duchess a "cover up" for a friendship between equals, a true affair, or were they pursuing independent agendas? Second, how did the Duchess affect Metternich's political career; and third, in the context of romantic affairs, were men seeking women out for companionship and satisfaction or were women seeking out men? With analysis of their personal correspondence it is possible to reveal a type of relationship and agency for the Duchess of Sagan that was truly off limits to women. This hints at the possibility that she had even greater influence on European politics of the era.

SPECTACULAR HISTORY: A PERFORMATIVE ANALYSIS OF THE 2008 BEIJING OLYMPIC OPENING CEREMONIES
Alexis Duffey
Category: History, Political Science and Economics, Section 1
Location: MSU Room, 9:30 AM
Mentor(s): Stephen Rohs (James Madison), Colleen Tremonte (James Madison)

In today's increasingly interconnected world, what is it that distinguishes one as uniquely "American?" Or "Muslim?" Or even "Han Chinese?" Is it shared history, language, and religion? Is it devotion to a particular political belief, or a set of moral principles? Is it both? Drawing from a range of disciplines, including cultural, political, and performance studies, I attempt to explore the creation of national and cultural identities as framed through one distinct event: the Opening Ceremonies of the

2008 Beijing Olympic Games. Exploring any type of "identity" (i.e. political, cultural, sexual) is always tricky, and attempts at categorization are often fiercely disputed; however, it seems that in the case of China, potentially the world's next global superpower, questions about "Chinese-ness" have literally taken 'center stage.' My research will demonstrate how in 2008, the opening ceremonies of the Beijing Olympic Games presented to both China and the world one compelling vision of what it means to be Chinese in the modern age, and the modes of performance that were used in order to make this vision convincing. I pay special attention to the interaction between dominant viewpoints on Chinese history, language, gender roles, traditions, etc., and "alternative" views that challenge some of these established constructions, as I see both present in the performance. In analyzing this "spectacle", I hope to challenge contemporary notions of "nation," "history," and "culture," as well as explore the implications that this particular vision has for future encounters between China and the rest of the world.

MICHIGAN POLICY NETWORK: URBAN AFFAIRS
Evan Gross
Category: History, Political Science and Economics, Section 1
Location: MSU Room, 9:45 AM
Mentor(s): Matt Grossmann (Political Science)

The Michigan Policy Network is an online student research forum dedicated to investigating and presenting information on a wide spectrum of state policy issues. As this year's Urban Affairs Fellow for the Michigan Policy Network, I have published articles and interviews relating to local and state government interaction, city finances, and state level urban policy. My research looks at the development of Emergency Manager Legislation in Michigan, the legal processes and procedures involved in declaring a local financial emergency, and current events related to the fiscal solvency of cities in Michigan. The research is intended to yield some prediction on which local governments may fall into a financial emergency in the coming months and years.

NATIVE AMERICAN COMMUNITIES AND THE VIETNAM WAR
Kailey Shelton
Category: History, Political Science and Economics, Section 1
Location: MSU Room, 10:00 AM
Mentor(s): Charles Keith (History)

In my presentation I will talk about the American Indian communities during the Vietnam War era. During a time of political and social unrest, a lot of focus shifts to the Black Power movement and the white working class. However, during this time period Native Americans also impacted the country by serving in the military, protesting the war, and forming political groups, demonstrating an impact upon this era. Thus, by referencing American Indian newspapers from the Vietnam War era, articles about American Indian communities at the time, oral histories and secondary sources about American Indians and the American Indian Movement, I hope to contribute to research about social and political unrest during the twentieth century in the United States. In particular, I will be focusing on the Native American communities and their reactions to the Vietnam War, Native American Vietnam Veterans, and the growing political groups such as the American Indian Movement.

THE CHANGING PERCEPTION OF GENGHIS KHAN IN MODERN FILM
Adam Fracker
Category: History, Political Science and Economics, Section 1
Location: MSU Room, 10:15 AM
Mentor(s): Catherine Ryu (Linguistics)

Throughout Western history, the name Genghis Khan induces images of death and destruction. However, the 21st century perception of Genghis seems to have changed. In the BBC documentary Genghis Khan, the description of the documentary claims that they will dispel several of the myths surrounding him. Likewise, the producers of the film Mongol: Rise of Genghis Khan make a similar claim. To what extent has the image of Genghis actually changed? This project investigates some of the reasons for the perceptual shift in the image of Genghis Khan such as how modern movies tend to show Genghis in a more Orientalized and romanticized light through his appearance on screen, the tone of his voice, and his actions during the film. Through the use of these cinematic tools Genghis has been reintroduced fundamentally in a very different way than in the past. In this fashion, Genghis's image is a change that coincides with the Western views of the East through Orientalism and remains distorted regardless of the accuracy of the information presented.

BLACK FEMALE RADICALISM IN THE CIVIL RIGHTS AND BLACK POWER ERAS
Silver Moore
Category: History, Political Science and Economics, Section 2
Location: MSU Room, 11:15 AM
Mentor(s): Shanti Ali Zaid (African American & African Studies)

Often times the examination and analysis of the Civil Rights and Black Power eras, both politics and key players, are contextualized under a masculine/patriarchal framework. Though women played a large role and the success and execution of the social and political workings of Black people, they often marginalized if not completely erased from Black Studies. Functioning within the apparatus of Critical Race Feminism, this paper reviews Black women activist in both the Civil Right and Black Power Eras. Specifically, I look at figures; Rosa Parks and Mabel Williams as sources to contextualize the Civil Rights era, and Elaine Brown and Angela Davis as sources to contextualize the Black Power era. Three main research questions guided this research: How did politics of respectability as well as masculine overtones in the Civil Rights and Black Power eras affect the way in which these women's radical politics were perceived and manifested? How were feminist politics presented in the political agendas of these women? In what ways did media representation shape the perception of these women and their politics? My research demonstrates that differences in politics of respectability within the Civil Rights and Black Power Eras. These differences marked the way in which these women both selected agendas, work to execute these agendas, and how these agendas were perceived and recognized. These finding contribute to expanding the marginalize study of history, women, and Black people.

LOCKING THEM UP: THE JUDICIARY AS A POLICYMAKER AND HOW IT AFFECTS FEDERAL POLICY CHANGE
Emily Kieliszewski
Category: History, Political Science and Economics, Section 2
Location: MSU Room, 11:45 AM
Mentor(s): Matt Grossmann (Political Science)

Under its guidance, the criminal justice system in the United States promises fairness and equal treatment to all. As citizens, this is the system that protects our rights and freedoms. Although many academics have set a precedent of great historical publications on the history of federal criminal justice policy, before this study, there was no collective research on what important factors affect this policy change. In this study, specific U.S. federal government policy enactments considered significant by authors were classified by type of legislation, proponents, government agencies promoting the legislation, interest group proponents, any opponents either from organizations and individuals, and whether either of the political parties was involved in promoting the legislation. By using a guide of 50 factors regarding authors' explanations of each change from a codebook, along with an illustrative quote from each book that provides the authors' views of causes behind specific policy change, data collection was done in a formal spreadsheet format to compare which factors were judged important. This compilation revealed a trend in criminal justice policy in the United States: an overwhelming amount of policy has been influenced by the judicial branch. Further research in this specific field is needed to form a more complete understanding of the judicial branch and its role in affecting policy change in the United States. Together with research on factors affecting other policy areas, we can gain a greater understanding of factors affecting change in the United States as a whole across all policy areas.

FOOD AND WATER COOPERATION IN THE MIDDLE EAST AND NORTH AFRICA
Rebecca Farnum
Category: History, Political Science and Economics, Section 2
Location: MSU Room, 12:00 PM
Mentor(s): Mark Axelrod (James Madison)

The Middle East and North Africa are facing increasing food and water security concerns. This research explores the relationships between food, water, environmental justice, and military security. This research focuses on the potential for food and water security to be, not a motivation for conflict, but a practical concern that can bring together vastly different political and religious ideologies to work toward mutual self-interest. The European Coal and Steel Community was formed in order to make war "not only unthinkable but materially impossible" (French foreign minister Robert Schuman). This project explores what a "MENA Food and Water Community" might look like, with the goal of diminishing conflict while improving state- and individual-level food and water security. With the guiding question "Can food and water be for the Middle East and North Africa what coal and steel were for Europe?," this research uses literature review, comparative case studies, game theory, and

empirical evidence to bring into academic discourse several facets of Middle Eastern politics previously neglected. The majority of research in this region focuses primarily on military security and religious conflict; food and water security is too often not connected with these issues. While there has been some work done previously on Mediterranean region economic integration; no major work found in an extensive preliminary literature review seriously explored the idea of MENA economic integration.

CARING FOR THE NORTH: FEMALE DOMESTIC WORKERS IN LOS ANGELES AND ROME
Chelsea Gallagher
Category: History, Political Science and Economics, Section 2
Location: MSU Room, 12:15 PM
Mentor(s): Louise Ann Jezierski (James Madison)

My research aims to prove the gendered construction of domestic labor through the examination of careworkers in the global cities of Rome and Los Angeles. Shifts in carework caused by globalizational forces have resulted in struggles of domestic workers within the city space to claim ownership to central areas and legitimization of their labor. Commonalities among these informal work sectors in northern global cities include the demographic of the work force being predominately female immigrants of color from poverty stricken nations. Because of these women's unique relationship with global pressures to support their families through more extreme measures, they are marginalized through this growing informal job sector. Low wages, long hours, and no formal health benefits are a result of this sectors informal status. Despite growing employment opportunities, their status as foreign females performing work that is not viewed as professional and the isolation and invisibility involved with their work, has made it more difficult for traditional methods of collective power and organization for labor rights. Despite these challenges, recent legislation in cities like New York, as a result of group organizational pressure on government from Domestic Workers United, is setting precedents for formal recognition of this labor sector. Other domestic worker organizations are cropping up across the world to fight for equal labor rights for domestic workers, and hope for formal recognition and rights are visible.

LOST CAUSE NATION: THE BIRTH OF A NATION AND CONFEDERATE IDEOLOGY
Kari Boyd
Category: History, Political Science and Economics, Section 2
Location: MSU Room, 12:30 PM
Mentor(s): Peter Knupfer (History)

A key portion of my senior honors thesis focuses on the creation and proliferation of the Lost Cause ideology in the years following Reconstruction and how this ideology became cemented in the American psyche. In 1915, the film *The Birth of a Nation* became the epitome of the lost cause ideology; advancing its positions on race and the south onto a new medium and igniting a new national discussion about the state of race in the United States. In this paper I explore the various important figures and signatures of the Lost Cause, the occurrences of this ideology in *The Birth of a Nation*, and the impact the film had on race relations in the early 20th Century. I pay particular attention to David W. Griffith's intentions while making *The Birth of a Nation* and the censorship battles waged between the NAACP and Griffith over the content of his film. The multitude of issues surrounding the content of the film and its release demonstrate the power film has to both reinforce existing social mores and spur intense dissent across the country.

Poster Presentations

MEDICAL MARIJUANA POLICY
Jessica Pedersen
Category: History, Political Science and Economics, Section 1
Poster #: 220
Location: Gold Room, 9:30 AM - 11:30 AM
Mentor(s): Matt Grossmann (Political Science)

The legality of medical marijuana has been a highly contested policy issue for several years, and various states in the U.S. have differing measures that govern its use. This poster showcases a cross-state comparison of different medical marijuana policies and how they compare to the policies in Michigan. The importance of this research lies in the offsets of the policy implications. The changing medical marijuana policies in Michigan affect the users of the drug in various ways outside of the realm of actual marijuana usage, and this research explores those implications. Using both documented information regarding medical

marijuana policy and information from experts, this research explores the way medical marijuana policy in Michigan is created and executed.

RISK ANALYSIS AND MITIGATION TOOL FOR GLOBAL SOURCING OF FOOD MATERIALS
Aritra Chatterjee
Category: History, Political Science and Economics, Section 1
Poster #: 221
Location: Gold Room, 9:30 AM - 11:30 AM
Mentor(s): J Roy Black (Agriculture Economics), Ram Narasimhan (Supply Chain Management)

Organizations (with reference to food manufacturers/processors) follow a heuristic risk based approach to select their suppliers globally once the decision of 'make or buy' is made. For example, some organizations use their own 'Consumer Safety and Quality/Technical' capability risk assessment process to evaluate their suppliers, and some work on the risk assessment of the raw materials to be sourced first, then draw up supplier selection plans according to the magnitude of risk associated. A few multinational organizations stress issues like 'environmental sustainability' and 'code of business principles' first before embarking on the quality system assessment and this often leads to the evaluation of sourcing from the right country, first by using tools like PEST (Political, Economical, Social, Technological) analysis and then adding various other factors that could affect the business decision. Smaller organizations (SMEs) attach importance to basic material cost break ups and inbound logistic cost only. Owing to such unstructured approach of not assessing/mitigating possible risks, companies often face unknown consequences arising out of choosing wrong suppliers that can potentially impact their brand reputation and financial risks (in the event of recall of products from markets etc) that protrude variability and uncertainty to their business continuity plan.

THE CAUSE OF PELLAGRA: A CRITICAL THINKING PERSPECTIVE
Allison Bratzel
Category: History, Political Science and Economics, Section 1
Poster #: 222
Location: Gold Room, 9:30 AM - 11:30 AM
Mentor(s): Michael Rip (Family Medicine)

An epidemic of pellagra plagued the southern United States in the early twentieth century. Recognizable by the "four Ds", dementia, dermatitis, diarrhea, and death, it affected an estimated 50,000 southerners by 1912. Now known to be caused by a diet deficient in niacin, a B vitamin, the cause of pellagra eluded experts in the United States and Europe for years. By 1915, Dr. Joseph Goldberger, an infectious disease researcher commissioned to study pellagra by the United States Surgeon General, proved it was caused by an inadequate, unvaried diet that did not provide enough protein. Concurrent with Goldberger's pellagra research, a privately-funded research team, the Thompson-McFadden Commission, erroneously concluded that pellagra was an infectious disease spread by poor sanitation. Both Goldberger and the Thompson-McFadden Commission conducted research in Spartanburg County, South Carolina, a county rife with pellagra. Goldberger succeeded in determining the cause of pellagra where so many other researchers failed because he used a scientific approach to the problem. Goldberger used scientific reasoning and looked for disconfirming evidence of his dietary deficiency theory of pellagra, whereas others looked for confirming evidence of their theories. Goldberger ran nutritional experiments and investigated inconsistencies in his data to prove his theory, avoiding the pitfalls of confirmation bias and correlation studies that led others to incorrect conclusions about the cause of pellagra. The differences between Goldberger's successful approach to studying pellagra compared to the Thompson-McFadden Commission's unsuccessful approach highlight the necessity of critical thinking in solving problems that persists to this day.

EVALUATING THE MICHIGAN BUSINESS INCOME TAX: A COMPARISON ACROSS STATES
Andy Chou
Category: History, Political Science and Economics, Section 1
Poster #: 224
Location: Gold Room, 9:30 AM - 11:30 AM
Mentor(s): Matt Grossmann (Political Science)

Governor Rick Snyder implemented a new Corporate Income Tax last year. Before this change, the former corporate tax, Michigan Business Tax, was seen as complicated and defective. Many scholars and businesses have been calling for a change in

the Michigan Business Tax. The current change in tax law has been viewed positively. A report by The Tax Foundation raised the rank of the Michigan business income tax to 7th from the previous 49th out of 50 states. However, such change came at a cost as this change brings a 1.7 billion loss in tax revenue. The loss in tax revenue is covered by cuts in business subsidies. However, opponents of the reduction in business subsidies contend that such change will be bad for business. It is important to evaluate this series of changes with a comprehensive view. My project looks at both change in business tax and tax credits and evaluates the effect of this change.

THE STATE(S) OF INEQUALITY: CHANGES IN INCOME DISTRIBUTION IN THE UNITED STATES, 1976-2008
Jessica Liu
Category: History, Political Science and Economics, Section 1
Poster #: 225
Location: Gold Room, 9:30 AM - 11:30 AM
Mentor(s): Charles Ballard (Economics)

We study the changes in the distribution of income from 1976 to 2008 in each of the 50 states and the District of Columbia, and in the nine Census Divisions, using annual data from the Current Population Survey. Most jurisdictions experienced an increase in household income inequality, although there are considerable differences in the precise patterns of disequalization. In most jurisdictions, the increases in overall inequality were dominated by changes in the upper half of the income distribution. If we consider the lower half of the income distribution, as measured by the ratio of income at the 50th percentile to income at the 10th percentile, inequality actually decreased in most jurisdictions. Thus in most jurisdictions, we document a pattern of divergence between the top and the middle of the income distribution, alongside a pattern of convergence between the middle and the bottom.

THE POLITICS AND FISCAL REALITIES OF MICHIGAN'S BUDGET DECISIONS
Karen Confer
Category: History, Political Science and Economics, Section 1
Poster #: 226
Location: Gold Room, 9:30 AM - 11:30 AM
Mentor(s): Matt Grossmann (Political Science)

One of the best ways to get a substantive look at what programs a state – and thereby its lawmakers, its interest groups and the rest of its political players – focuses on is to look at where it spends its money. Every state has a finite budget, and how lawmakers divide this pot between the multitudes of government programs gives a good sense of their policy priorities. For the past decade, Michigan has suffered through a painful recession, and as citizens' bank accounts tightened, so did the state's. When Gov. Rick Snyder signed a $47 billion budget in June 2011, he promised it would bring stabilization to state funding, but only at the cost of "shared sacrifice" to resolve the estimated $1.5 billion deficit. The fiscal year 2013 budget looks as though it might be friendlier to many segments of the state, but demands still are much higher than resources. Education and health services alone guzzle far more than half of the available dollars, and these also comprise some of the primary areas citizens refuse to accept funding cuts. Lawmakers are left to make unpopular slashes or raise taxes in unpopular ways. A cross between to-the-minute journalism and analysis of spending trends, budgetary history and different state approaches, my research examines the who, what and why of Michigan appropriations decisions.

Humanities and Performing Arts

Oral Presentations

GRAFFITI LANSING: THE IMPACT OFF THE WALL
Brooke Hawkins, Mike Kulick, Ethan Tate, Jessica Whitmill
Category: Humanities and Performing Arts, Section 1
Location: Parlor B, 9:00 AM
Mentor(s): Danielle DeVoss (Writing, Rhetoric, and American Cultures (Professional Writing))

Our research seeks to uncover the impact of graffiti on the greater Lansing area. Particularly, we are interested in how graffiti creates a public space for art, launches conversation, and creates community. For our project, we interviewed a local graffiti artist and will present some of his work from REO Town. In our presentation, we will screen a short section of video interviews with the artist and share a series of REO Town graffiti images. Through this presentation, we hope to show how graffiti is a multifaceted conversation. This conversation takes place not only between artists, but between a community and an artist, and between a community and its collective values. This greatly influences how a community can develop, grow, and thrive. Graffiti can serve as public art and can deeply signify the way a community represents itself.

FASHIONING AND RE-FASHIONING: MORMON WOMEN IN THE BLOGOSPHERE
Allegra Smith
Category: Humanities and Performing Arts, Section 1
Location: Parlor B, 9:15 AM
Mentor(s): Amy DeRogatis (Religious Studies), Danielle DeVoss (Writing, Rhetoric and American Cultures)

With the expansion of Internet technologies in the last decade, Mormon women in both the home and the professional realm are taking to the blogosphere in droves. Female bloggers within the Church of Jesus Christ of the Latter-Day Saints are situated within a unique religious tradition, and often use the Internet to profess both their religious and personal identities. The modern Mormon woman uses the Internet and blogging platforms to assert facets of her Mormon identity through three different arenas: 1) Her reproductive role in the family, in bearing and raising children (as demonstrated through motherhood and lifestyle blogs); 2) Her place in relation to her husband, in the heteronormative Mormon couple and sexual division of labor (as demonstrated through lifestyle blogs, particularly those where young Mormon women serve as sole breadwinner as their husbands pursue higher education); 3) Her performance of a feminine gender identity and preservation of her God-given modesty (as demonstrated through Mormon fashion and style blogs). I aim to analyze how these different roles either reinforce ideals laid down in the Mormon scriptures and by church officials, or create and assert a new identity for Mormon women.

NOT THE SAME "HAPPILY EVER AFTER": NATIONAL IDENTITIES INSCRIBED IN HÄNSEL UND GRETEL
Nathan Bynum
Category: Humanities and Performing Arts, Section 1
Location: Parlor B, 9:30 AM
Mentor(s): Catherine Ryu (Linguistics, Germanic, Slavic, Asian, and African Languages)

The years immediately following World War II were a time of great confusion for Japan. With the post-war occupation, Douglass MacArthur and SCAP had begun creating policy to remedy Japan into a more democratic nation. Similarly, in the early 19th Century, Germany had been disassociated from the Holy Roman Empire and it was forging a new country for itself. After comparing these two historical contexts, one can see how literature can be adapted by the views of the period. Despite these similar historical circumstances, the opinions of each country, in regard to its authorities, were different. These differences have been inscribed accordingly on the cultural products of the time. Particularly, the different implications of the Japanese version of Hänsel and Gretel are substantially more vague than the original German version in regard to the family structure. In this paper, I outline how the different characters of the family show connections to the previously warring nations: The Father can be seen as the nation itself. The Stepmother can be seen as the nucleus of the war and the children can be seen as the citizens of the warring nations. I argue that the unstable family in the Japanese version of Hänsel and Gretel from post-World War II Japan has an added sense of ambiguity in order to show the nation's uncertain way of thinking in regards to the authority of the time, based on linguistic and cultural nuances.

ARCS: A COMMUNITY-DRIVEN DIGITIZATION PLATFORM FOR HUMANITIES COLLECTIONS
Josh Compton, Nick Reynolds
Category: Humanities and Performing Arts, Section 1
Location: Parlor B, 9:45 AM
Mentor(s): Jon Frey (Art History & Visual Culture)

Archaeological Resource Cataloging System (ARCS) is a Web-based application that can be used to digitize and document research materials at an archaeological excavation, and can serve as a model for preserving collections of humanities materials at a general scale. Possible applications include preservation of endangered languages (both written and spoken); archiving collaborative memory projects such as memorial sites; or newspaper digitization. The research behind ARCS focuses on preserving collections of humanities resources and leveraging the power of a digital environment to create a platform for engaged communities to document resources in a way that protects the connection between information and artifact. ARCS also allows for community driven validation methods for preserving the credibility of data documented from those resources. This research is important because it takes great strides in not only preserving humanities resources, but also creating a collective memory of the communities surrounding those resources. Humanities materials have an inherently limited scope to which their information can be spread with traditional means. With the advent of social software, not only can humanities artifacts be preserved, but so can the rich information and culture that made those artifacts worth preserving. Our findings provide invaluable insight into best practices for preserving these collections in a digital space and the methods behind community driven information documentation and validation across any number of humanities collections. In our presentation we will demonstrate various methods in which ARCS accomplishes preservation, documentation, and validation of the information found in these collections and the artifacts themselves.

TRANSITIONING TO LIFE AND LEARNING AT MSU: OUR CHINESE STUDENTS' PERSPECTIVE
Cara Gonzalez
Category: Humanities and Performing Arts, Section 1
Location: Parlor B, 10:00 AM
Mentor(s): Scott Chiu (WRAC)

As a pioneer university for international exchange, the MSU community has a vested interest in the transition, experience, and perception of the Chinese students that call East Lansing home. In my research, I engaged the Chinese student community through interviews and data compilation. By exploring their experiences, my aim was to assess if there is a gap between accommodations available for Chinese students and the goals they have for their college experience. This exploration was piloted by the following questions: Where do they live in terms of space and community? What challenges and advantages do they encounter in and out of the classroom? And how do professors or local students perceive their growing Chinese community on campus? The answers to these questions can add insight to conversations and decisions about how to better accommodate this burgeoning demographic. Chinese students continue to be the fastest-growing international student population in U.S. colleges--MSU alone has 3,012 Chinese students, five times as many as they had in 2005. This near-exponential growth speaks volumes about MSU's commitment to promoting diversity. It also has far-reaching implications, from how professors structure their classes to creating new dynamics in college culture. With so many resources invested in reaching this community, it would be remiss to neglect the viewpoint of Chinese students.

DECONSTRUCTING THE FIGURE OF EMPEROR TAIZONG IN EDUCATIONAL SOURCES
Yifu Huang
Category: Humanities and Performing Arts, Section 1
Location: Parlor B, 10:15 AM
Mentor(s): Catherine Ryu (Linguistics and Germanic, Slavic, Asian, and African Languages)

In conventional Silk Road studies, Emperor Taizong (599-649) has received critical attention because his reign in early Tang Dynasty represents the so-called the "Golden Age" of the ancient Silk Road world. This project reexamines the modern portrayal of Emperor Taizong to investigate how this imperial figure has been reconstructed in the twenty-first century, particularly in Chinese and Western educational sources. To that end, this project will compare a Chinese educational movie Emperor Taizong in Tang Dynasty (2008) with two publications, China's Cosmopolitan Empire, The Tang Dynasty, (2009) and China in World History (2010), written by Western historians Mark Edward Lewis and Paul S. Ropp, respectively. This project will

ultimately demonstrate how each of these modern sources still contains its own biases in representing this historical figure in the globalized context of the twenty-first century.

FANG LIJUN AND HIS POST-CULTURAL REVOLUTION CHINA
Wanruo Wangshen
Category: Humanities and Performing Arts, Section 1
Location: Parlor B, 10:30 AM
Mentor(s): Karin Zitzewitz (Department of Art, Art History, and Design)

China's Cultural Revolution from 1966 to 1976 has served as a long-lasting cultural dislocation, which has asserted an enormous presence within the root of Chinese culture and the populace's cognition. A large number of contemporary Chinese artists have either indicated their subjective understandings or personal experiences of the Cultural Revolution through their work, or objectively portrayed it. Compared to other artists focusing on the Cultural Revolution, Fang Li Jun, a contemporary Chinese avant-garde artist with a unique perspective, is known for his paintings of post-Cultural Revolutionary China and for the creation of Cynical Realism. Fang himself was both a participant and a witness of the Cultural Revolution – this dual identity enables him to both perceive this catastrophic event and its later influences in two dimensions. I believe Fang did the best work, among all Chinese contemporary artists, by visually acknowledging the lived situation and psychological status of modern China. Of most importance is Fang's series of aggressive, bald, rogue figures best representing the Chinese people and their general psychological conditions. Many people say they are not accurate or even completely wrong, but I see this series as the best icons. They are not detailedly drawn, though they have demonstrated the most important characteristics – the pretended "absence" and "irrelevance". The poison of this revolution will be long lasting. It paralyzes the culture's vitality, while it also erases people's independent personality, and identity. Overall, Fang is a master of capturing the features and then displaying it to audience.

THE MAP OF NAMUR AS EXTENDED MIND: A COGNITIVE AND LITERARY HISTORY OF ARTIFICIAL MEMORY
Austin Gorsuch
Category: Humanities and Performing Arts, Section 1
Location: Parlor B, 10:45 AM
Mentor(s): Natalie Phillips (English)

In Laurence Sterne's *Tristram Shandy* (1759-1767), the narrator's obsessive uncle hangs in his room a map of the battleground upon which he was wounded. His goal is to reconstruct a picture of his remembered campaign--one that will allow him to "stick a pin upon the identical spot of ground where he was standing in when the stone struck him." In an age of artificial memory systems, like the Blackberry, GPS, and Google Maps, considering how such mnemonic tools have been historically conceptualized (and critiqued) can help problematize our progressive narratives of unhindered technological integration. This project, first, historicizes ideas about artificial memory in the Enlightenment. Reading Sterne's novel alongside Descartes' *L'Homme*, I argue that Sterne satirizes and deploys a Cartesian model of memory to mock a vision of consciousness that locates the self purely in the material brain. I show how such early literature complicated any theory of cognition that restricted human memory to the physical, emphasizing the mind's mnemonic reliance on the surrounding world. My work points toward an alternate eighteenth-century model of memory storage that locates the remembered self in the relationship between brain and environment--and highlights the vital role of the external objects we use to store memories. I end discussing an fMRI experiment that uses technologies from modern neuroscience to investigate the brain's engagement with different external memory systems (books, maps, and digital applications); through such interdisciplinary work, I demonstrate how historical perspectives on the mind and brain can inform modern views of cognition.

A CRITICAL EXAMINATION OF CONSTANCE FENIMORE WOOLSON: ESCAPING THE SHADOW OF HENRY JAMES
Craig Pearson
Category: Humanities and Performing Arts, Section 2
Location: Lake Huron Room, 9:00 AM
Mentor(s): Sheila Teahan (English)

Constance Fenimore Woolson, a late nineteenth century American realist writer, was born in New Hampshire and spent much of her childhood and young adulthood traveling in the midwestern and northeastern United States. She began publishing fiction in 1870 and enjoyed a popular career as a novelist and occasional travel writer that eventually took her to Europe, where she met Henry James, with whom she developed a close friendship. In the century after her death, Woolson was dismissed as a

competent but insignificant regional writer or “local colorist,” and her work was largely overlooked. Only in recent years has Woolson reemerged as an important American realist and feminist perspective. My presentation engages in a critical analysis of Woolson’s fiction and argues that her literary reputation has been significantly affected by her association with Henry James. Critical and biographical examinations of Woolson have frequently been made only in the context of James, resulting in a skewed perception of Woolson as both spurned lover and outmatched writer. I argue that Woolson’s deceptively simplistic prose merits a second look, and that her work contains elements and themes that advanced American realism and hold as much resonance for modern readers as they did for her nineteenth century audience.

HOW CULTURAL PERSPECTIVE SHAPES LITERACY
Michelle Hevelhorst
Category: Humanities and Performing Arts, Section 2
Location: Lake Huron Room, 9:15 AM
Mentor(s): Chien-Hsiung Chiu (Writing, Rhetoric, & American Culture)

This research focuses on two assignments from Michigan State University’s Writing and Rhetoric in American Cultures (WRA) 1004 Writing and WRA 150 classes. The first assignment calls upon students to analyze their personal literacy, while the other asks students to write about a cultural artifact and its significance to daily life. The focus of this research is not on why or how international students choose topics for these assignments. Rather it explores how the choice of non-western cultural artifacts, by international students, affects the consultation session and the complications that arise when L2 learners attempt to relate non-western cultural artifacts to western teaching and rhetorical paradigms. More specifically, how these topics are worked through by the L2 learners’ native culture lens and how this ultimately affects the consultation session between writing consultant and client. I believe that by examining consultations between L2 clients and American consultants’ one can obtain qualitative data that will measure the effectiveness of cross-cultural consultations with these assignments. For example, does a consultant’s unfamiliarity with non-western cultural artifacts hinder or help an L2 student’s navigation of western teaching methods and assignments? Does the present writing center methodology aid international students or frustrate students who are likewise unfamiliar with western academic tropes and questions? By observing writing consultation sessions that meet the specific parameters of my research, and interviewing clients after the sessions, I aim to answer these questions and shed light on how to better aid consultants and clients alike dealing with these assignments.

PHILOSOPHY AND THE BLACK EXPERIENCE AND PHILOSOPHY OF THE AFRICAN AMERICAN IN SPORTS
Lorenzo Buchanan
Category: Humanities and Performing Arts, Section 2
Location: Lake Huron Room, 9:30 AM
Mentor(s): John McClendon (Philosophy)

I will be presenting on my assistance to Dr. McClendon on his books, "Philosophy and the Black Experience" and "Philosophy of the African American in Sports", what I learned in general, and what I learned regarding the importance and need of not just a Black Philosophy, but the recognition of Blacks in various areas, from Sports to politics, and highlighting the knowledge gained from my assistance to Dr. McClendon.

CHINESE SARTORIAL CHARM: COLORING THE PERCEPTION OF CHINESENESS
Ni Chen
Category: Humanities and Performing Arts, Section 2
Location: Lake Huron Room, 9:45 AM
Mentor(s): Catherine Young Kyung Ryu (Linguistics & Germanic, Slavic, Asian, and African Languages)

This project analyzes the modern perceptions of “Chineseness” through how Chinese dresses along the Silk Road were reproduced in films. To that end, this project examines two films, Macro Polo (2007) and Ma Ko Po Lo (1975). The former was released in the United States and the latter in Hong Kong, China. Precisely because both of these films cover the Yuan Dynasty dominated by the Mongols who appropriated Chinese identity, they are particularly well suited to investigating the constructed nature of Chineseness. By comparing these two films, this project will answer the question central to delineating the idea of Chineseness: How can we interpret the notion of Chineseness constructed in each film through their use of different hues? More specifically, (1) What are the main colors of dresses in each film in relation to the characters’ original roles? (2) How do these colors represent “Chineseness” at crucial moments of the films? From both Western and Chinese perspectives,

"Chineseness" can be constructed more objectively and completedly. Ultimately, this project will deconstruct modern perceptions of national identities that shape the representation of cultural exchanges along the Silk Road in the ancient time.

THE EAST/WEST THEME IN RUSSIAN SYMBOLIST LITERATURE
Richard Holland
Category: Humanities and Performing Arts, Section 2
Location: Lake Huron Room, 10:00 AM
Mentor(s): Jason Merrill (Russian)

Geographic location has often been used in discourse surrounding Russian national identity as a context for exploring Russia's historical, political, and spiritual relationships with other nations. Traditionally, Russian thinkers have positioned their country between a "West" conceptualized as progressive, civilized and democratic, and an "East," cast as barbaric, culturally stunted, and despotic. While numerous scholars have explored this construct, as well as its use in Russian political and cultural life, its use in literature of the Symbolist period (1890-1920) has yet to be thoroughly examined. I propose to explore the use of this East/West dichotomy by Russian symbolist writers by examining selected prose works of Andrei Bely, Fyodor Sologub, Valery Bryusov, and Alexei Remizov, and analyzing these authors' depictions of East/West interaction in the context of Russian literary and political thought. By examining the symbolists' uses of the East/West construct, we may gain a more complete understanding of the symbolist movement's characterization of Russian national identity, as well as of the movement's relationship to earlier thinkers regarding the role of Russia in world political and spiritual life. My preliminary research indicates that, although the aforementioned writers frequently used the East/West theme to engage with contemporary philosophical questions regarding Russia's fate (particularly in the wake of the 1905 Revolution), they, unlike earlier Russian thinkers like Vladimir Solovyov and Fyodor Dostoyevsky, refrain from making messianic claims regarding Russia's role in world political and cultural affairs.

DECONSTRUCTING THE SILK ROAD IN THE GLOBAL IMAGINARY
Chen Du
Category: Humanities and Performing Arts, Section 2
Location: Lake Huron Room, 10:15 AM
Mentor(s): Catherine Young Kyung Ryu (Linguistics and Languages)

This project focuses on two historical figures, a seventh-century Chinese monk Xuanzang and a Swedish explorer Sven Hedin, who traveled along the Silk Road in early twentieth-century. In particular, this project analyzes their different representations of the Silk Road. Through a comparative analysis of the documentary "The Road of Xuanzang" (directed by Timu Jin in 2007 which was made by China Central Television) and The Silk Road (written by Sven Hedin in 1904), this project re-evaluates how people's imagination of the Silk Road has been shaped and persisted. The two major foci of the analysis will be the visual representations and the verbal descriptions found in these two works. The visual representation focuses on the key scenery in the documentary and the photos in the book. The verbal description examines the two figures' interactions with the local people. In the presentation, more detailed evidence will be provided to show how the two travelers from vastly different cultures, in different historical moments seem to show the same Silk Road imagination. Sweden was the first western country to establish diplomatic relations with China. Therefore through a comparative analysis of the two representations of the Silk Road, this project ultimately unveils the persistent presence of Orientalism in the global imaginary.

BREAST CANCER AND CULTURAL PERCEPTIONS OF THE BREAST
Clara Balliet
Category: Humanities and Performing Arts, Section 2
Location: Lake Huron Room, 10:30 AM
Mentor(s): Patricia Rogers (Residential College in the Arts and Humanities)

Emotional responses to breast cancer are shaped by broader cultural perceptions of the female breast. While disciplines, including science, humanities, and art have researched breast cancer from many angles, there exists little humanities literature studying breast cancer before its onset. My goal is to explore how cultural views of the female breast influence emotional reactions to breast cancer through the lens of social constructionism. In particular, I will focus on women who have never experienced breast cancer but have experienced it indirectly through their friends or family. To realize my goals, I will carry out an academic study of the relevant literature as well as conduct interviews and surveys of individuals within the Lansing

community. Through my research, I will offer insight into a current gap in humanities literature while also giving voice to a population of women who have gone unheard.

AI WEIWEI'S VISION: CONCEPTUALIZING ART AS A RESULT OF NATIONAL TRAGEDY
Kristin McCool
Category: Humanities and Performing Arts, Section 2
Location: Lake Huron Room, 10:45 AM
Mentor(s): Karin Zitzewitz (Art History and Visual Culture)

In May 2008, an earthquake ravaged China's Sichuan province, claiming over 70,000 lives, according to the Chinese central government. An overwhelming number of lives lost that day were school children, trapped in poorly constructed schools. Families of the children petitioned the Sichuan authorities, calling for an investigation of local officials involved in the schools construction, but after countless attempts, still the Chinese government remained silent. In response, Chinese artist Ai Weiwei co-launched the "Citizen's Investigation." This project was designed both to name the corrupt officials who profited from the faulty construction and more shockingly, to record the names of the dead children. In March 2009, he extended the project by creating Remembering, a brightly colored display of backpacks covering the façade of Munich's Haus der Kunst Museum. In my research, I intend to examine the preconceived notion of art as only referring to the "visual image." I will raise the question of how both the "Citizen's Investigation" and Remembering can be considered works of art. Of key importance are the relationships between the textual and the visual and the concrete and the impermanent. In so doing, my paper attempts to account for the social role of the artist in contemporary art.

GRAFFITI QUEENS: AN EXAMINATION OF FEMALE PARTICIPATION AND RESISTANCE IN THE MASCULINE SUBCULTURE OF GRAFFITI
Chelsea Gallagher
Category: Humanities and Performing Arts, Section 3
Location: Parlor B, 1:00 PM
Mentor(s): Jenifer Goett (James Madison College)

For my research, I looked at the female presence in the subculture of graffiti. Despite mainstream popularity today, and a legitimization of the illegal practice as an art form, females are rarely represented as participants. Through ethnographic analysis of male and female graffiti artists, I found that the subculture's masculine construct makes it more difficult for females to move beyond the periphery. However, through the development of graffiti, women have had a presence that has been distinctly unique and just as relevant to discourse on the subject. Their presence within the subculture threatens the perception that this activity is acceptable for females to do. To other male youths who participate in graffiti, females pose a threat to the masculine qualities that have been attached to the group. Female participation also goes against outer societies expected role for young females. While females remain the minority in the graffiti world, the Internet has opened up an opportunity to greater recognition. Social media, blogs, and downloadable web magazines have brought together female artists from around the world to claim their space in the evolutionary cultural and artistic expression of graffiti.

"THE AVE" PROJECT
Emanuele Berry
Category: Humanities and Performing Arts, Section 3
Location: Parlor B, 1:15 PM
Mentor(s): Geri Zeldes (Journalism)

This project was designed to highlight Lansing's identity through multimedia storytelling. 'The Ave' was produced through collaboration between students and staff at Michigan State University and various Lansing community partners. Students collected and produced stories that have a strong connection to Lansing. Initially, the project collaborators identified eight stories, which will be accompanied by interactive placards installed along the Michigan Ave/Grand River corridor. As a student and Lansing native, I've had the honor to be part of this project and share the stories that make up Lansing. Upon the completion of this project, organizers hope the interactive archives of Lansing help transform the way the people see the city.

THE ATOMIC BOMB REVISITED: ENSHRINING CHILD FIGURES IN JAPAN'S NATIONAL TRAUMA
Rebecca Avila
Category: Humanities and Performing Arts, Section 3
Location: Parlor B, 1:30 PM
Mentor(s): Catherine Ryu (Linguistics and Germanic, Slavic, Asian, and African Languages)

This project examines the ways in which the atomic bombings of Hiroshima and Nagasaki were represented by the Japanese people in manga, film, and other media. The main focus will be on works by atomic bomb survivors (hibakusha) – in particular, Nakazawa Keiji's manga Barefoot Gen (1973) and its subsequent films (1983; 1986) – and historical accounts of censorship in the postwar Occupation era. Given the SCAP's censorship of works released in the years immediately following World War II, this project investigates how that policy shaped the way that the atomic bombings were remembered in Japanese culture. More specifically, this project analyzes how the Japanese people used the figure of the child to express their sorrow and anger concerning the atomic bombings in such a restrictive environment. This project ultimately reveals that the pressures of the censorship mobilized Japanese writers and artists to use the figure of the child to remember their nation's past trauma in a universalizing – and therefore acceptable – manner.

SYLVIA PLATH: HER STRUGGLE WITH INESCAPABLE GENDER ROLES
Allie Browe
Category: Humanities and Performing Arts, Section 3
Location: Parlor B, 1:45 PM
Mentor(s): Kirsten Fermaglich (History)

By analyzing Sylvia Plath's poetry alongside sexist magazine advertisements, examining her journals and letters, and considering societal factors, I was able to conclude that Plath was unable to escape the role of housewife. Despite her feministic inspired poems, the patriarchal society of the 50s and 60s greatly shaped Plath's life; ultimately, she became the embodiment of women's powerlessness to escape social norms. Through Daddy and Ariel, Plath attempted to convey female autonomy, but she failed to fully break away from the notion of the submissive female. Since Plath published many of her poems in women's magazines—and even worked as editor at Mademoiselle—she willingly assisted in the publication of columns that promoted gender stereotypes and the preservation of the homemaker role. Many of her letters and journal entries illustrate her inability to transcend a patriarchal society. This is clearly shown through her sacrifice of an intellectual life for a married life with Ted and her children. Sylvia Plath's marriage was a product of post World War II culture, which fought to preserve domestic ideologies and the concept that being a housewife resulted in adopting a sense of purpose, personal fulfillment, comfort, and security. Since Plath was surrounded by 1950s and 1960s ideals of marriage and motherhood, marriage soon became her main focus. Society placed an emphasis on being the perfect housewife, but this pressure eventually led to Sylvia Plath's demise.

THE ROAD TO 501(C)3: REGISTERING MIDDLE OF THE MITTEN EVENTS AS AN OFFICIAL NON-PROFIT
Dan Nufer
Category: Humanities and Performing Arts, Section 3
Location: Parlor B, 2:00 PM
Mentor(s): Jonathan Ritz (Writing, Rhetoric, and American Cultures)

For the past several years, a music showcase called Middle of the Mitten (MOTM) has been bringing together indie bands and music fans in the Lansing region for a yearly show. Now MOTM wants to expand into a community-based arts organization that not only produces an annual event but also provides ongoing opportunities to connect musicians, fans, media personnel, venue owners, retailers, and others stakeholders in the regional music community. Professional Writing student Dan Nufer has created a strategic plan that provided MOTM with a clear path to reaching this next level. His work began by researching model organizations and articulating needs in the local music community that MOTM could help meet. He has also created a working blueprint for MOTM as a nonprofit organization, including its mission statement, staffing structure, and various projects and initiatives it will pursue. Finally, he will present this strategic plan at the University Undergraduate Research and Arts Forum, along with reflections on what he learned from the process. Each step has been mentored by Dr. Jonathan Ritz, an assistant professor and academic adviser in the Professional Writing program.

BLURRING THE DIVIDING LINES: HOW PUBLIC TRANSPORTATION CAN BRING TWO COMMUNITIES TOGETHER
Kathryn Palczewski
Category: Humanities and Performing Arts, Section 3
Location: Parlor B, 2:15 PM
Mentor(s): Danielle DeVoss (Writing, Rhetoric, and American Cultures)

Thousands of people ride CATA buses everyday. These bus routes represent one of the only bridges between the Lansing and East Lansing community: Michigan's capital and Michigan's largest university. East Lansing and Lansing are rich and diverse places, but often we do not experience our cities as a 'community.' Instead, we experience them as two separate places. We will ask the question: "Could the buses be a way to bring Lansing and East Lansing together"? Through video and audio recordings our team will document passengers and their stories. We will conduct random interviews and ask these three simple questions: Where are you going? Where are you coming from? Why are you here? In the presentation we will show excerpts from our documentary and discuss the outcomes and processes of our research project. Our research will reveal the power of a conversation and the significance of public transportation in connecting two communities to build one. East Lansing and Lansing are often situated as two very different, separate places. This prohibits people from feeling part of a larger community. The CATA interviews will share the faces and stories of people who physically cross the East Lansing/Lansing dividing line on the bus on a daily basis, and show that the lines between East Lansing and Lansing aren't as divided as they seem.

Poster Presentations

ESTABLISHING THE HISTORY OF ROLLER DERBY UNIFORMS/COSTUMES
Amber Bembnister
Category: Humanities and Performing Arts, Section 1
Poster #: 230
Location: Ballroom, 9:30 AM - 11:30 AM
Mentor(s): Theresa Winge (Art, Art History, and Design)

During the last decade, Roller Derby gained in popularity, both with its participants and fans, throughout the world. The attraction to this sport centers around it being an aggressive contact sport featuring female athletes. Despite the aggressive and dangerous aspects of this sport, these athletes dress in provocative and hyper-feminine uniforms. Accordingly, the role of uniform for the Roller Derby athletes cannot be underestimated. The uniform is further intriguing due to the lack of standards regarding dress for this sport. This project investigates the origins and evolution of the Roller Derby uniform. It begins by exploring the many incarnations of the sport, including its early years when men and women roller skated together. From this data, the Roller Derby uniforms will be documented for further analysis to establish the importance of contemporary uniform within this flourishing sport. This research study seeks to understand the complexities for the Roller Derby uniform (or costume) throughout the history of this sport, which is part of a larger study focusing on Roller Derby. This portion of the study is funded by the College of Arts and Letters Undergraduate Research Initiative Grant.

UNDERSTANDING FASHION DESIGN UTILIZING TRANSFORMATIONAL RECONSTRUCTION PATTERN METHODS
Martin Flores, Jessie Moyer
Category: Humanities and Performing Arts, Section 1
Poster #: 231
Location: Ballroom, 9:30 AM - 11:30 AM
Mentor(s): Theresa Winge (Art, Art History, and Design)

Transformational Reconstruction is an innovative pattern design methodology developed by Shingo Sato. Sato redefines Western pattern methods by incorporating the Japanese geometric spatial relationships from the folds of origami to construct with curvilinear seams. The transformational qualities of these techniques may revolutionize the geometric and mathematical aspects of pattern drafting, as well as introduce inventive silhouettes in fashion designs. Since Transformational Reconstruction is a relatively new method, the limits and extensions of its applications are unknown. This project focuses on researching the Transformational Reconstruction methodology through experiential learning, as well as a search of the literature for patterning techniques used in Japanese culture. The outcomes are designs that reflect the concepts introduced and explored within Transformational Reconstruction. These innovative fashion designs suggest the extents without approaching the limits of these experiment techniques. This study is funded by the College of Arts and Letters Undergraduate Research Initiative Grant.

CIVIC DISOBEDIENCE: HOW GRAFFITI INFLUENCES CREATIVE COMMUNITIES
Brooke Hawkins, Mike Kulick, Ethan Tate, Jessica Whitmill
Category: Humanities and Performing Arts, Section 1
Poster #: 232
Location: Ballroom, 9:30 AM - 11:30 AM
Mentor(s): Danielle DeVoss (Writing, Rhetoric, and American Cultures (Professional Writing))

Our research seeks to uncover the impact of graffiti on the greater Lansing area. We are particularly interested in how graffiti creates a public space for art, launches conversation, and creates community. Specifically, we aim to demonstrate how graffiti is an art form that can create a bridge between the Lansing and East Lansing communities. This poster will provide images, graphs, time lines, and maps related to the REO Town, Lansing graffiti project. Through this poster, we hope to inform and open a dialogue with the East Lansing community about the creative communities in the greater Lansing area. With recognition of the rich diversity of the area, we hope to spark conversations about Lansing in order to better understand how creativity, art, and graffiti can bring communities together.

FOURTH GENRE: RESEARCHING THE REPUTATION OF A LITERARY JOURNAL
Ziev Beresh
Category: Humanities and Performing Arts, Section 1
Poster #: 233
Location: Ballroom, 9:30 AM - 11:30 AM
Mentor(s): Laura Julier (WRAC)

Fourth Genre is a national literary nonfiction journal published through the Michigan State University Press. The journal publishes a variety of writing, from personal essays and memoirs to literary journalism and personal criticism. After publishing pieces deemed to be noteworthy and innovative, how is the publication then regarded as a whole? The goal of this project is to research the reputation of *Fourth Genre* by compiling gathered information into a report of the journal's perception and standing. By being aware of its presence and perception, *Fourth Genre* can continue to expand and improve its reputation among writers, writing programs, and other literary journals.

A CRITICAL ANALYSIS OF CITIZENS UNITED V. FEDERAL ELECTION COMMISSION
Samantha Goulet
Category: Humanities and Performing Arts, Section 1
Poster #: 234
Location: Ballroom, 9:30 AM - 11:30 AM
Mentor(s): James Roper (Philosophy)

Professor James Roper and I, Samantha Goulet, have been researching a detailed philosophical analysis of the Citizens' United v Federal Election Commission (FEC) Supreme Court decision. This is very important research in that the decision brought about both extreme praise and criticism. Some claim that the United States government has been fundamentally changed from the decision and it seems vital to look at this from a philosophical perspective. Also, there are some that claim that the decision will influence the direction in which social and political philosophy is headed academically. The primary objective of the research is to look at the decision through the focus lens of social and political philosophy with special attention to social contract theories and social covenant theories.

EXCEPTIONALISM AND ILLUSION: DEMYSTIFYING THE MOROCCAN ARAB SPRING
Tiffany Abrahamian
Category: Humanities and Performing Arts, Section 2
Poster #: 240
Location: Ballroom, 1:30 PM - 3:30 PM
Mentor(s): Safoi Babana-Hampton (Romance and Classical Studies)

In December of 2010, the self-immolation of a Tunisian vendor ignited a rash of anti-regime protests thus catalyzing the revolutions sweeping the Arab World in 2011. Amidst this "Arab Spring", Morocco emerged as an exception to the bloody violence and upheaval that ravaged the region. This uprising, later known as the February 20th Movement, is credited with pressuring the Moroccan King to produce democratic concessions. However, critics of the regime cite these concessions as an

illusory smoke screen intended to garner international approval. By illuminating multiple perspectives and contextualizing individual experiences, my project provides a multi-dimensional analysis of the events in Morocco to circumvent the generalizations and stereotypes that are often applied to socio-political conflicts. I have compiled these perspectives by tracing the movement through English and Francophone media outlets, social networking, and conducting a primary interview. The purpose of my research is to interpret how social conditions, regional politics, cultural milieu and cyber-activism contribute to engaged citizenship. Through deconstructing media claims, this research seeks to expose dichotomous perceptions of the movement and how plural perspectives and free speech forge the grass roots of democratization.

MEDIA AS AN ACTOR
Deanna Christy
Category: Humanities and Performing Arts, Section 2
Poster #: 241
Location: Ballroom, 1:30 PM - 3:30 PM
Mentor(s): Alison Dobbins (Theatre)

Drama is a device to explain our world. As the world grows smaller and our understanding greater, our needs in this area grow more complex. The inner struggles of what it is to be human, to feel emotion, or to grapple with emotion remain, but what of complex issues like social and political order? Innovations in the technology of theater have allowed the stage to become a playground for exploring these more compex issues. We incorporate digital elements into drama to reflect their use in our society, but we also integrate them on another level because their constant influence is changing how we think, act, and interact. These changes are crucial issues in society and must therefore be explored in theater. In this way, media in theater is not just "spectacle" but is a vital part of modern performance practice.

THE INSTRUMENTALITY OF CREATIVITY
Katherine Pastor
Category: Humanities and Performing Arts, Section 2
Poster #: 242
Location: Ballroom, 1:30 PM - 3:30 PM
Mentor(s): Scott Schopieray (Academic Technology)

The ability to create music has been traditionally associated with the creative mind. Little research, however, has studied the ways in which music can create and stimulate creativity. People will often listen to music when they want inspiration, for brainstorming, or simply to aid their creativity for a project. Why is this a common practice? My research seeks to uncover the relationship between the two, and determine if music has the potential to promote creativity itself. In order to do this, I am conducting a study to evaluate the ways in which three different genres of music (all non-lyrical) affect a 'non-musically inclined' person's creativity. By having participants complete two separate tasks while listening to music, and taking a short survey afterward, I will glean both quantitative and qualitative data for analysis. I am particularly interested in whether classical music itself or simply non-lyrical music matters as far as generating a sort of "Mozart effect" in creativity stimulation. In my presentation, I will present the resulting data from each musical genre and their corresponding creative output against themselves while also showing their effect upon each individual's creativity. If music positively affects creativity, I will look into ways to utilize the results in creative work environments to stimulate work quality.

CAMOUFLAGE: A LINK BETWEEN ART AND SCIENCE
Ruth Bauer, Erika First, Ariana Koch, Kate Swierz
Category: Humanities and Performing Arts, Section 2
Poster #: 243
Location: Ballroom, 1:30 PM - 3:30 PM
Mentor(s): Juan Alvarez (MSU Museum), Gary Morgan (MSU Museum), Robert Root-Bernstein (Physiology)

Camouflage is a well-known part of society. However, few people know how it came to be. Who first discovered, and attempted to inform the world about, camouflage and its applications to society? What kind of background did he have? Was he a well-known scientist or academic? In fact, he was a well-known painter named Abbott Thayer. In our presentation, we attempt to convey how it took a painter's eye to popularize what the scientific community dismissed.

INCREASING THE VISIBILITY AND PRESENCE OF FOURTH GENRE: EXPLORATIONS IN NONFICTION AT THE ASSOCIATION FOR WRITERS AND WRITING PROGRAMS CONFERENCE

Lauren Ebelt, Christine Scales

Category: Humanities and Performing Arts, Section 2
Poster #: 244
Location: Ballroom, 1:30 PM - 3:30 PM
Mentor(s): Laura Julier (Writing, Rhetoric and American Cultures)

Fourth Genre is a national literary nonfiction journal published biannually through Michigan State University Press. The journal has a small staff, comprised mostly of interns with an interest in the publishing industry. Given the high turnover rate of interns and a new editor to the journal, *Fourth Genre* is looking to create a firm and interesting presence in the publishing community. This project aims to research, enhance, and promote *Fourth Genre*'s presence at the Associated Writers and Writing Programs conference in Chicago. The hope is that future interns will be able to use the materials that we create to use for future writing conferences. To complete this goal, we first researched the conference and past designs and ideas. We collaborated with the editor to come up with a budget, and brainstormed ideas on what could feasibly work with a small working station and transportation in mind. We also helped design a new brochure and bookmark for the journal. We then worked to create a schedule for people to work at the conference, organized transportation, and helped create and organize the table design and materials. We will use these designs at the conference from March 1-March 3, and then leave instructions and thoughtful hints for future interns.

Linguistics, Languages, and Speech

Oral Presentations

GOING THE DISTANCE: EFFECTS OF DISTAL AND GLOBAL SPEECH RATE CONTEXT ON WORD SEGMENTATION
Christopher Heffner
Category: Linguistics, Languages, and Speech, Section 1
Location: Parlor C, 11:00 AM
Mentor(s): Laura Dilley (Communicative Sciences and Disorders), J Devin McAuley (Psychology)

Determining where one word stops and the next word starts in speech is not a simple matter; listeners use many cues to segment words. It has recently been determined that slowing down the rate of speech within a sentence around a region with ambiguous word segmentation (the "distal" speech rate) affects word boundary placement. The present work investigated a possible role for "global" speech rate cues found further than a sentence away from a possible word boundary. Participants were assigned to one of four global timing conditions. For one condition, the "invariant" condition, sentence fragments were played at a single, moderate speech rate. For three other conditions, global speech rate context was played at one of five possible rates, with an average speech rate equal to the invariant condition (the "moderate" condition), slower than the invariant condition (the "slow" condition), or faster than the invariant condition (the "fast" condition). In line with previous studies, slowing down distal speech rate led to a decrease in word boundary placement within the acoustically-ambiguous region. Critically, global speech rate context also affected word boundary placement; a slow global speech rate context led to a decrease in word boundary placement compared to the fast global speech rate context, with the moderate and invariant global contexts intermediate between the two. The results here echo previous results from non-linguistic acoustic processing, where global timing context influenced timing perception, suggesting a role for domain-general acoustic processing in speech perception.

BENEFITS OF A SOUND SYSTEM: AN ANALYSIS OF COCHLEAR IMPLANT SPEECH
Abaries Farhad
Category: Linguistics, Languages, and Speech, Section 1
Location: Parlor C, 11:15 AM
Mentor(s): Yen-Hwei Lin (Linguistics and Languages)

Until recently, children with severe to profound pre-lingual deafness typically developed a way of speaking, called "deaf speech," which contains a number of consistent error patterns. Articulatory characteristics of deaf speech most often described in the literature include substitutions, omissions, distortions, and voicing errors (Ellis 2009). However, with the development and advancement of cochlear implant technology, in conjunction with intensive speech therapy, it is no longer inevitable that deaf children acquiring speech and language will develop these trademarks of deaf speech. While not a cure for deafness, cochlear implants (CIs) can be provide deaf children with an astounding approximation of hearing and improved access to auditory input and speech stimuli, in turn facilitating the development of speech with fewer deviations from the target model. For my senior thesis in linguistics, I have chosen to study the speech of deaf children who were implanted with CIs during the pre-linguistic stage of oral language development. My hypothesis is that CI speech is characterized by subtler articulation errors that differ qualitatively from those found in deaf speech. To examine this hypothesis, I have performed phonetic analyses of CI speech samples and data collected from sources such as the Department of Otolaryngology-Head and Neck Surgery at the Indiana University School of Medicine and the University of Iowa Cochlear Implant Center. I posit that CI speech can be described in terms of phonological generalizations and rules which are distinct from those of deaf speech but nonetheless cannot be accounted for by developmental processes alone.

EXAMINING WESTERN FILMIC IMAGES OF MUSLIMS BETWEEN 1950-2005
Sara Mousa
Category: Linguistics, Languages, and Speech, Section 1
Location: Parlor C, 11:30 AM
Mentor(s): Catherine Ryu (Linguistics and Languages)

This project analyzes the historical transformation of the Western view of Islam and Muslims. In particular, this project illuminates Western perception of Muslims by focusing on two Western films: *Flame Over India* (1959) and *Looking for Comedy in the Muslim World* (2005). In examining these films, this project will delve into the significance of the roles given to Muslim characters and the implications on the Western view of Muslims. These roles will be analyzed based on the verbal interactions between Muslim and Western characters as well as physical appearance of the characters. The first movie, which was made at a time when Eastern Islam and Muslims were foreign concepts to most living in the West, demonstrates the West's disinterest in Eastern/Muslim culture. The second movie shows a more amalgamated view of Western and Muslim characters. Based on the analysis of these movies, this project illuminates the transformation of the Muslim image in Western culture from the mid-20th century to present day.

EVERYTHING IS EVERYTHANG?: EXPLORING THE INTERACTIONS BETWEEN METAPHORS AND MEMORIES
Liz Harvin
Category: Linguistics, Languages, and Speech, Section 1
Location: Parlor C, 11:45 AM
Mentor(s): David Walton (African American and African Studies), Shanti Zaid (African American and African Studies)

This paper explores how the African American Language (AAL) artifact 'Everythang is Everythang' carries out the work of intergenerational memory transfer and metaphoric communication. The phrase 'Everythang is Everythang' and other phrases such as 'It's All Good' and 'It Is What It Is' help to communicate a common theme throughout African American culture regarding survival through faith and perseverance. Founded in the George Lakoff and Mark Johnson's notion that "our conceptual system is largely metaphorical," and Rosalind Shaw's premise that "imprints of trauma" play a huge role in how memories are remembered, this paper examines how 'Everythang is Everythang' and phrases like it serve as a metaphorical mechanism through which memories of African American experiences are transferred. This paper argues that through the Black artistic, literary, and musical expression, 'Everythang is Everythang' carries out the work of intergenerational memory transfer and representative metaphoric communication.

PRACTICE MAKES OPAQUE: LEARNING OPAQUE PHONOLOGICAL PROCESSES
Christopher Heffner
Category: Linguistics, Languages, and Speech, Section 1
Location: Parlor C, 12:00 PM
Mentor(s): Karthik Durvasula (Linguistics and Germanic, Slavic, Asian, and African Languages)

Almost all humans are capable of learning a language; however, it remains an open question whether there are any hypothetically conceivable patterns in language that cannot be learned. Here, one of these possible patterns, known as "phonological opacity", is examined. Under traditional phonological accounts, known as Rule-Based Phonology (RBP), opacity can result from rule ordering: one sound change that precedes a second could be obscured by the latter change. The more modern theory known as Classic Optimality Theory (OT) cannot accommodate opaque phonological patterns without additional, sometimes ad hoc, mechanisms. A recent study by Ettlinger, Bradlow, and Wong (revision submitted) argues that only participants with high scores on tests of memory can learn opaque phonological processes in an artificial language. Here, it is claimed that the question of whether there are memory constraints that slow the acquisition of phonological opacity is irrelevant to the ultimate question of whether opacity itself is learnable. Under traditional generative accounts, memory falls straightforwardly under the umbrella of linguistic performance constraints; if even some people can learn opacity, it indicates that opacity may eventually fall under linguistic competence for all. In our extension to Ettlinger et al.'s (revision submitted) paradigm, participants were evaluated on their acquisition of opaque phonological processes twice, each after a block of practice; it is hypothesized that acquisition of the opaque generalizations will improve for all participants across time, indicating that the ultimate endpoint for nearly all participants is the acquisition of phonological opacity.

Poster Presentations

YOU MUST BE AS TALL AS THIS LINE TO RIDE THE ROLLER COASTER: "EXACTLY" READINGS OF "AS" COMPARATIVES
Kait Ayres, Katrina Torgerson
Category: Linguistics, Languages, and Speech, Section 1
Poster #: 250
Location: Ballroom, 9:30 AM - 11:30 AM
Mentor(s): Alan Munn (Linguistics and Languages), Cristina Schmitt (Linguistics and Languages)

Huang et al. (2011) show that numerals behave differently from other quantifiers: children treat them as meaning "exactly n", rather than "at least n". This is consistent with Breheny's (2008) argument that the "at least" interpretations are pragmatically created, and that "exactly" readings are not scalar implicatures. We present the results of two experiments that show that children behave like adults with respect to treating as-comparatives as meaning "exactly equal" unless explicit context is provided. As with Huang et al.'s (2011) result with numerals, this is incompatible with accounts which treat the "exactly" readings of as-comparatives as scalar implicatures. If the ≥ 'greater than or equal to' interpretation of the as-construction were a scalar implicature, we would expect children to allow that interpretation in non-promoting contexts. However, this was not the case. Our data provide evidence that as-comparatives, like numerals, have "exactly" meanings, and the ≥ 'greater than or equal to' interpretation is derived through pragmatic means.

WHY DO KIDS SAY DRIVER-TRUCK BUT NOT TRUCK-DRIVE? CHILDREN'S ACQUISITION OF SYNTHETIC COMPOUNDS
Kait Ayres, Heather Wiltse
Category: Linguistics, Languages, and Speech, Section 1
Poster #: 251
Location: Ballroom, 9:30 AM - 11:30 AM
Mentor(s): Jessica Gamache (Linguistics and Languages), Cristina Schmitt (Linguistics and Languages)

Synthetic compounds (SCs) like truck-driver are noun compounds that are derived from verb noun units (e.g., drive truck). Although not frequent in the input, children fully acquire SCs by the age of 6 (Clark et al., 1986: Nagpal & Nicoladis, 2009). How SCs are acquired, however, is subject to debate. Clark et al. argue for two developmental stages, (i)-er- and object-less forms (driver-man), and (ii)-er-"optional" forms (drive(r)-truck), driven by children's tendency to preserve sentential word order (i.e., verb-object). Nagpal and Nicoladis, however, argue that the acquisition of SCs is delayed by exposure to other structures, such as running-man, which are arguably easier since -ing is one of the first learned morphemes (Brown, 1973). Importantly, neither study shows truck-drive forms where the object appears before drive before -er is added. We present two studies on the acquisition of SCs with children and adults in order to test these two proposals: (i) production task: children were asked to name a person or machine performing a simple task (e.g., throwing a bug) and (ii) repetition task: children were given names in one of two forms, truck-driver or truck-driving-man, and asked to repeat them back. Preliminary results reveal patterns similar to those in the Clark et al. study and importantly do not show that -ing is produced commonly or more easily than -er, contra the claims of Nagpal and Nicoladis. The results support Clark et al.'s findings and can be explained by the way SCs are built in the syntax.

VOWEL CHARACTERISTICS OF MOTHERS OF CHILDREN WITH NORMAL HEARING AND WITH COCHLEAR IMPLANTS
Juliane Brinkman
Category: Linguistics, Languages, and Speech, Section 1
Poster #: 252
Location: Ballroom, 9:30 AM - 11:30 AM
Mentor(s): Laura Dilley (Communicative Sciences and Disorders), Liz Wieland (Communicative Sciences and Disorders)

Research indicates that mothers' vowel space is significantly expanded in speech to infants in comparison with speech to adults, and that this expanded vowel space may aid in the language development of children (Liu, Kuhl, & Tsao, 2003). The present study compares the vowel spaces speech to normal-hearing infants (NH) and speech to infants with cochlear implants (CI). Two separate groups of NH control children were matched to CI children based on chronological age and hearing experience, respectively. Mothers were recorded in semi-structured interviews with another adult and during interactions with their children at 3- and 6- months post device-fitting (for CI children) or at a matching temporal interval (for NH children). Measurements of the first formant (F1), second formant (F2), and fundamental frequency (F0) were obtained for the three English point vowels (/i/, /a/, and /u/), and the areas of the resulting vowel triangles were compared based on the infant's hearing status, temporal interval, and type of addressee (infant or adult). Preliminary results show that vowel spaces of

mothers on average were expanded when speaking to NH or CI children relative to when speaking to another adult, although, individual variation was observed. These findings have implications for developing intervention strategies to improve speech and language skills in children with CIs.

CAN YOU TELL ME MORE?: COMPUTER-ASSISTED LANGUAGE LEARNING IN THE CLASSROOM
Marissa Perry
Category: Linguistics, Languages, and Speech, Section 1
Poster #: 253
Location: Ballroom, 9:30 AM - 11:30 AM
Mentor(s): Senta Goertler (Linguistics and Languages)

Learning a second language is one of the most challenging intellectual undertakings for adults. Computer-assisted language learning (CALL) offers the hope of making language learning more effective by allowing students to personalize their language learning experiences within a classroom. This research project will evaluate the effectiveness of introducing the CALL program Tell Me More in German language classes at Michigan State University. The Tell Me More research group has conducted pre-testing of all students enrolled in a German class in order to determine a base German language level and will administer post-tests at the end of April to establish language improvement over the course of the semester. It is expected that 200 students will complete the full Tell Me More study. By tracking the amount of time students spend using Tell Me More, it will be possible to discern any correlation between Tell Me More and language acquisition. In my presentation, I will present the results of the Tell Me More project thus far. In particular, the study will show whether students are working on areas that the placement test designated as weaknesses, or if individuals spend more time on already proficient areas. This research project will provide insight on ways language instructors can better connect CALL programs such as Tell Me More to classroom instruction.

ACQUISITION OF 2ND PERSON SINGULAR IN CHILEAN SPANISH
Camila Alfonso, Anaite Castaneda
Category: Linguistics, Languages, and Speech, Section 1
Poster #: 254
Location: Ballroom, 9:30 AM - 11:30 AM
Mentor(s): Cristina Schmitt (Linguistics and Languages)

Latin American dialects of Spanish contain a variety of different pronouns corresponding to the second person singular (2sg) ("you"): usted is the formal form and tú or vos are the informal forms. Usted triggers third person singular (3sg) agreement on the verb. Tú and vos trigger similar agreement, except in the present, imperative, and subjunctive tenses. For example, "you talk" is either tú hablas or vos hablás, but "you talked" is tú/vos hablaste in both cases. In Chilean Spanish verbal agreement with vos is different than in other dialects: "you talk" is vos hablái; additionally both tú and vos are used, and tú can appear with vos agreement but not vice-versa. In other words there is not a one-to-one correspondence between the pronoun used and the verb form used. The child acquiring Chilean Spanish is confronted with a complex and overlapping set of pronouns and verb inflections all corresponding to 2sg. Our goal is to examine their use in child-directed speech and its effect on child learning. Using the Miller-Schmitt corpus we examine the distribution of 2sg in adult speech to children and whether this is mirrored in child speech. Since frequency has been shown to affect acquisition, one hypothesis is that the most common form will be acquired first. However, children have also been shown to have a strong bias towards regularization. Thus, a competing hypothesis is that the most regular form--that is, the form with the fewest exceptions and irregularities--will be acquired before the others.

PREDICATE NOMINALS IN CHAUCER: A STUDY IN DIACHRONIC SYNTAX
Bailey Doolittle
Category: Linguistics, Languages, and Speech, Section 1
Poster #: 255
Location: Ballroom, 9:30 AM - 11:30 AM
Mentor(s): Cristina Schmitt (Linguistics and Languages)

In Romance languages, German, and Dutch it is possible to say 'John is professor/doctor/lawyer', indicating that it was possible in Middle English (ME). In modern English, professions and other roles in predicate position must be preceded by the indefinite article 'a' except when the role is unique as in 'Obama is President'. In this paper we ask what is the status of NP predicates in

ME (1150-1500). Do post-copular NPs require determiners in ME or not? When did the indefinite determiner start to be required? What changed in English grammar to require the use of the indefinite? The existence of linguistically parsed corpora available online makes much more efficient and reliable the otherwise time-consuming task of examining old manuscripts to track changes. In this paper we analyze texts from later eras in the East Midlands dialect of ME available in the Penn-Helsinki Parsed Corpus of ME and texts from the Penn-Helsinki Parsed Corpus of Early Modern English. Using Corpus Search to automatically extract all predicate nouns, we determine whether post-copular NP predicates were productive and whether they followed the same constraints as other Germanic and Romance Languages. We follow Munn & Schmitt's 2005 study of predicate nominals across various languages and we hypothesize that singular in previous stages of English did not require a determiner, but in modern English it does. Given that predicate nouns must have number (singular or plural), the indefinite is used to realize number.

CONSONANT PRONUNCIATION VARIATION IN SPEECH TO NORMAL-HEARING AND HEARING-IMPAIRED INFANTS
Bridget Molnar
Category: Linguistics, Languages, and Speech, Section 1
Poster #: 256
Location: Ballroom, 9:30 AM - 11:30 AM
Mentor(s): Laura Dilley (Communicative Sciences and Disorders)

In spite of much research in recent decades into how children gain linguistic competency, many questions remain. Researching the acoustic details of maternal speech input received by infants can help give an answer. Little work exists on consonant variability in speech directed to infants, especially those with hearing impairment. To investigate this variability, we examined the frequency of assimilation in infant- and adult- directed speech by mothers. Assimilation is a type of speech variation where the pronunciation of words ending with certain consonant sounds changes, depending on the following word (e.g. “green ball” can be pronounced “gree[m] ball”). Tokens of word-final /t,d,n/ were classified into one of four variant categories to determine how the hearing status and age of the child impacts maternal speech. It was found that exposure to consonant variability may help infants’ ability to make sense of coarticulation present in the speech signal. One factor to be examined in this research is the phonological environment of words. For instance, it is predicted that word-final /d/s are less likely to be pronounced with assimilation and more likely to be deleted when preceded by a /n/ (as in the phrase “sand castle”). Understanding early speech input can have implications for clinical practice since this input provides information pertaining to the development of normal and disordered communication in children with varied hearing abilities.

THE PRESENCE OF PERCEPTUAL ISOCHRONY IN SPONTANEOUS SPEECH
Jacob Pristas, Stephanie Schmidt
Category: Linguistics, Languages, and Speech, Section 1
Poster #: 257
Location: Ballroom, 9:30 AM - 11:30 AM
Mentor(s): Laura Dilley (Communicative Sciences and Disorders)

It has been proposed that perceptual isochrony, i.e., perceived rhythmic regularity of stressed syllables in speech, is utilized by speakers during speech production and by listeners during speech comprehension (Lehiste, 1977). However, studies of measures of speech rhythm have so far been limited to quantifying the extent of acoustic regularity among stressed syllables, and have largely failed to address the issue of whether and when isochrony occurs in perception. Confirming and quantifying the presence of perceptual isochrony in everyday speech is an important step in understanding the mechanisms of speech production and perception. The current study investigates correlates of speech rhythm in spontaneous conversation. Audio recordings collected as part of the Buckeye Corpus of Conversational Speech (Pitt et al., 2007) were analyzed to study perceptual isochrony in everyday speech; this corpus consists of a number of speakers from Columbus, Ohio being interviewed and speaking freely about various topics. Using phonetic labeling software, these files were analyzed and coded for the length of speakers’ utterances, the locations of prominent and accented syllables, and perceived rhythmic sequences. Perceptual isochrony was assessed using measures of average length of evenly rhythmic phrases, the ratio of isochronous syllables to total syllables in the sample, and locations of prominent syllables with respect to phrase and utterances boundaries. These analyses will help to address open questions regarding the existence of perceptual isochrony in spontaneous speech, and will further understanding of the kinds of information that listeners may use to decode words during spoken language processing.

CONSONANT PRODUCTION IN INFANT-DIRECTED SPEECH TO HEARING-IMPAIRED INFANTS AND TO ADULTS
Daniel Chabala
Category: Linguistics, Languages, and Speech, Section 1
Poster #: 258
Location: Ballroom, 9:30 AM - 11:30 AM
Mentor(s): Laura Dilley (Communicative Sciences & Disorders)

Are consonants pronounced more carefully by mothers in infant-directed speech (IDS) than in adult-directed speech (ADS)? Moreover, if infants have hearing impairments, do mothers change their speech to accommodate the infants' hearing status? This project looks at the production of word-medial consonants /t/ and /d/, as in kitten and middle, since these two consonants have previously been shown to exhibit many phonetic variants in ADS; in particular, pronouncing word-medial /t/ and /d/ as a canonical [t] or [d] has been taken as an index of clear speech (Pitt et al., 2011). The influence of surrounding segmental context and lexical stress on the extent to which canonical [t] and [d] are pronounced will be examined (cf. Pitt et al., 2011; Raymond et al., 2006). Preliminary results suggest that phonetic variant distributions are the same for IDS and ADS as a function of surrounding segmental context, which we argue helps children to learn the English-specific distribution of these variants. Such results run counter to previous findings showing more careful pronunciations of mothers' vowels in IDS compared with ADS (Liu et al., 2003), but we hypothesize that by pronouncing consonants in IDS and ADS with equal care mothers are actually helping their children learn English by using consistent /t/ and /d/ pronunciations as a function of surrounding segmental context. The results provide information relevant to understanding how children learn language under conditions of normal hearing vs. hearing impairment.

PATERNAL INVOLVEMENT IN CHILDREN'S EARLY LITERACY DEVELOPMENT
Mackenzie Patterson, Jaimie Medel, Andrea Ryba
Category: Linguistics, Languages, and Speech, Section 2
Poster #: 260
Location: Ballroom, 1:30 PM - 3:30 PM
Mentor(s): Lori Skibbe (Human Development & Family Studies)

Paternal involvement in their child's early literacy development has been under-studied within the home learning environment. However, a positive correlation between fathers' involvement and greater early literacy rates for children ages 3-5 years old has been identified (Ortiz, 2002). Literacy rates of pre-school age children and married fathers were collected through research gathered from three university preschools. Previous research articles involving parental involvement, surveys completed by the child's father, and one-on-one assessments with children involving literacy skills were sources for data analysis. Then, relationships between the paternal education level, martial satisfaction, and involvement in home learning environment were correlated to their child's literacy development. Additionally, research concerning father-daughter and father-son interactions to early literacy rates were also examined. More advanced early literacy development is related to higher levels of paternal educational background, more literacy activities available in the home, and more reported time spent with the child. Results have confirmed the importance of examining paternal participation in their child's early literacy development.

BACK AND FORTH WITH CLASSES AND THAT KIND OF THING: A STUDY OF GENERAL EXTENDER USE IN PHILADELPHIA
Kathryn VerPlanck
Category: Linguistics, Languages, and Speech, Section 2
Poster #: 261
Location: Ballroom, 1:30 PM - 3:30 PM
Mentor(s): Suzanne Wagner (Linguistics and Languages)

This study aims to provide a preliminary contribution to the understanding of the use of general extenders (GEs) in American English and how it compares to other varieties of English. GEs are used to suggest or extend a possible set. Some examples of GEs include: "and stuff like that", "and everything", and "or whatever". Previous research has found that GE usage is most frequent among teenagers. Recent research has also focused on whether or not GEs are grammaticalizing, moving from their function as set-extenders to a general discourse function. This study looks specifically at the GE usage of a small corpus of high school girls from Philadelphia. The girls were interviewed once in 2005, when they were high school seniors, and again in 2006, after their transition to college. GEs were extracted from these interviews and were coded for a variety of linguistic and social factors. This poster will focus on the frequency and form of GEs in this sample of American English and the extent to which they are grammaticalizing. Further research will look at GE usage across a larger corpus of American speech.

LIONS, ZEBRAS, AND PLURALS, OH MY!
Adam Liter, Christopher Heffner
Category: Linguistics, Languages, and Speech, Section 2
Poster #: 262
Location: Ballroom, 1:30 PM - 3:30 PM
Mentor(s): Cristina Schmitt (Linguistics and Languages)

While English has an obligatory singular/plural distinction, in Japanese/Korean bare nouns allow both plural and singular interpretations. To disambiguate between a singular and a plural reading, optional markers ("one" or a special pluralizer) can be added. We report an experiment testing English-speaking participants' ability to learn an artificial language based on Japanese/Korean-like number system. We specifically investigate adults' ability to produce and interpret bare nouns and the optional number markings as well as adults' ability (or lack thereof) to generalize grammatical structures. We ask whether (i) adults can learn that bare nominals can have singular and plural interpretations and, if so, whether they will treat bare nouns as English plurals and (ii) whether they will match the frequency of determiner usage in their inputs, as opposed to generalizing the usage of determiners. We hypothesize that participants acquire an English-like understanding of bare nouns—that is to say, that they will treat it as the English bare plural (Sauerland et al., 2006)—but that participants produce determiners with a frequency consistent with their inputs in learning sessions, as Hudson Kam & Newport 2005, 2009 found. Our results will shed light on the process of regularization—that is, on generalization beyond the input given to build a grammar in a novel language.

VARIABLE LENITION AND THE ACQUISITION OF 2ND PERSON SINGULAR IN CHILEAN SPANISH
Anaite Castaneda, Camila Alfonso
Category: Linguistics, Languages, and Speech, Section 2
Poster #: 263
Location: Ballroom, 1:30 PM - 3:30 PM
Mentor(s): Hannah Forsythe (Linguistics and Languages), Cristina Schmitt (Linguistics and Languages)

Chilean Spanish differs from Mexico City Spanish in that syllable-final /s/ undergoes a variable process of weakening called lenition. Sometimes it is pronounced as /s/, sometimes it is weakened to /h/, and other times deleted altogether. Syllable-final /s/ is the crucial factor in marking plurality (la niña = the girl vs. las niñas = the girls), as well as informal second person singular forms (hablas = you-informal speak vs. habla = s/he or you-formal speak/s). Therefore, we might expect Chilean children, who receive an inconsistent input, to lag behind Mexican children in their development of the plural, as well as second person singular. The delay in plural comprehension has been amply demonstrated, but that of second person singular has not. In this paper, we examine Chilean children's production of 2nd person singular, compared to their parents, as well as to their peers in Mexico. Specifically, we look for any errors of agreement and analyze their rate of lenition in different verbal contexts (null versus overt subjects, position at the end of the utterance, etc.) to determine whether they match the adults or whether they are generalizing to a single form. We test four children grouped by age and socioeconomic status.

DUALISM IN THE HEBREW FIRST PERSON SINGULAR NOMINATIVE: A REFLEX OF AN AFROASIATIC SYNTACTIC PARADIG
Abaries Farhad
Category: Linguistics, Languages, and Speech, Section 2
Poster #: 264
Location: Ballroom, 1:30 PM - 3:30 PM
Mentor(s): John Eulenberg (Communicative Sciences and Disorders)

In Biblical Hebrew, there are two words for the first person singular nominative (FPSN) pronoun ("I"): a-ni and a-no-khi. Post-Biblical Hebrew has retained only the shorter ani form. Modern grammars and dictionaries of Biblical Hebrew define both as the word for "I", but do not distinguish between the two words, implying that they are equivalent in every way. Morphologically, the two words differ by the presence or absence of the root consonant /k/, represented by the Hebrew letter kaph, postvocalically, khaph. In this study, I have been part of a team at the MSU Artificial Language Laboratory examining the hypothesis that the distribution of these two words for "I" is not random, but is in fact governed by a specific conditioning rule. Moreover, we posit that this rule is found in other Afroasiatic languages where the same syntactic marker, /k/, is found to behave in a similar manner. In order to pursue our hypothesis, we have developed a computer program to extract instances of the two FPSN pronouns and their contexts from throughout the entire Hebrew Pentateuch. In this poster session, I will present evidence from both Biblical Hebrew and from Modern Hausa, an Afroasiatic language spoken in West Africa.

MOST EFFECTIVE METHODS OF CORRECTIVE FEEDBACK
Nina McNure
Category: Linguistics, Languages, and Speech, Section 2
Poster #: 265
Location: Ballroom, 1:30 PM - 3:30 PM
Mentor(s): Shawn Loewen (Linguistics and Languages)

When professors correct student's mistakes they use a variety of techniques to do so. The focus of this study will look at how receptive students are to the different ways corrective feedback is used during class periods. Student receptiveness will be measured by how well students notice the given feedback and whether or not they can produce the correct form afterwards. If the student can continue to use the correct form even after the initial feedback then optimal learning has occurred and the technique is effective. The study looks at a Spanish 102 classroom with high beginning to low intermediate level students. The professor primarily uses recasts and metalinguistic feedback among other strategies to correct his student's errors. Which of these forms produces the most beneficial feedback will be examined based on the above-mentioned criteria of being received and producing long lasting learning. Since teacher or professor feedback is one of the primary ways students grow in their language learning, then knowledge of the best practices for various error corrections plays a vital role in students future language learning success.

AN EYE-TRACKING PERSPECTIVE ON PROSODIC DISAMBIGUATION COMPETENCE
Elliot Selkirk
Category: Linguistics, Languages, and Speech, Section 2
Poster #: 266
Location: Ballroom, 1:30 PM - 3:30 PM
Mentor(s): Jessica Gamache (Linguistics and Languages), Cristina Schmitt (Linguistics and Languages)

Green house can have two meanings: (i) a house that is green (phrasal prosody) or (ii) a place where plants are grown (compound prosody). In order to recognize this difference, English speakers must know that the stress and timing of the two readings, i.e., the prosody, affect the meaning. Previous studies looking at adults' ability to use prosody to disambiguate phrasal units from compounds reveal that adults perform poorly on judgment tasks with novel compounds (e.g., red cup for a red flower), showing a bias for phrasal prosody (Vogel & Raimy, 2005; Good, 2008). We argue that these results are an artifact of the offline task used. In this study our aim is to determine to what extent adults can use prosodic cues to differentiate between compound and phrasal prosody of linearly identical word sequences. We use both judgment and eye-tracking data in order to more accurately gauge the strength of the prosody-syntax interface. Subjects will be presented simultaneously with two images and an accompanying phrase and will be asked to select the image that corresponds to what they hear. Eye movements will be recorded from the onset of the audio stimuli using the EyeLink eye-tracker. Based on work by Zhou et al. (2011) and Good (2008), who showed that when using online measures (eye-tracking, response times) eye movements follow a prosodic parse, we predict that adults may judge novel compounds inaccurately but may have the same eye-movement patterns for known compounds, showing sensitivity to the prosody.

Microbiology, Immunology, and Infectious Disease

Poster Presentations

DNA SEQUENCING IN DIAGNOSING RARE FUNGAL PATHOGENS
Stela Tereziu, Kathleen Higgins
Category: Microbiology, Immunology and Infectious Disease, Section 1
Poster #: 270
Location: Gold Room, 9:30 AM - 11:30 AM
Mentor(s): Lionel Mendoza (Biomedical Laboratory Diagnostics)

In the clinical laboratory the proper identification of pathogens is critical for an accurate diagnosis and the selection of a specific treatment. This cannot always be done using standard methodologies, especially when the involved etiologic agents are unusual fungal pathogens that most laboratory workers are not familiar with. Here we described an unusual case of subcutaneous phaeohyphomycosis in a goat caused by an unidentified black fungus. We took advantage of molecular methodologies to PCR amplify the 18S SSU rDNA and the Internal Transcriber Spaces (ITS) from genomic DNA extracted using a pure culture of the black fungus. After sequencing and BLAST analyses the pathogen under investigation was identified as Exserohilum sp. This research project is a good example on how the molecular methodologies can be used in the identification of common or unusual pathogenic viruses, bacteria, parasites and fungi that could be causing infections in humans and animals.

ANTAGONISM AMONG MICHIGAN STURGEON HATCHERY AND STREAM EGG ISOLATES
Brian Lovett
Category: Microbiology, Immunology and Infectious Disease, Section 1
Poster #: 271
Location: Gold Room, 9:30 AM - 11:30 AM
Mentor(s): Terence Marsh (Microbiology and Molecular Genetics)

The interactions between the bacteria which can colonize sturgeon eggs is not well understood. Observed changes in egg mortality as a result of early inoculation with a bacterial species demonstrates the import of the microbial community which surrounds an egg. Predominance of a species on the surface can be attributed to increased fitness of one strain over another through competitive advantages and antagonism. Using a soft agar stamping method, we aim to elucidate the types of interaction between bacteria we have isolated from a Michigan sturgeon hatchery and stream sturgeon eggs. Once interactions among strains has been established, we will investigate the mode and conditions required for these interactions. Better knowledge of how these microbes interact will enhance our ability to interpret and understand the ecology surrounding sturgeon eggs.

CROSS-LABORATORY COMPARATIVE STUDY OF THE IMPACT OF EXPERIMENTAL AND REGRESSION METHODOLOGIES ON SAL
Ian Hildebrandt
Category: Microbiology, Immunology and Infectious Disease, Section 1
Poster #: 272
Location: Gold Room, 9:30 AM - 11:30 AM
Mentor(s): Bradley Marks (Department of Biosystems and Agricultural Engineering)

Thermal inactivation studies often are aimed at testing the effects of various product factors on the inactivation rate of pathogens. However, the lack of standardized methods causes significant difficulties when trying to compare results across studies, and also limits the utility of merged data sets for meta-analyses or improved inactivation models. Therefore, the objective was to determine whether experimental methodologies for isothermal inactivation tests, or data processing methods, significantly affect resulting inactivation parameters. Two separate laboratory groups (MSU and USDA) each performed two different isothermal inactivation trials at 60C, each using two methods previously published by each group. The raw data were then pooled and analyzed independently by each group, with MSU computing D-values using linear regression of the log(CFU/g) data, and USDA computing D-values from the rate parameter from regression of the same data using DMFit. In pairwise comparisons of the survivor data using analysis of covariance, the P values for intra-laboratory results were 0.07 and 0.01, and for intra-method results were 0.07 and 0.45. When comparing the D values, determined using the two different regression methods by the respective groups, the differences were 3-6% or 21-40% when analyzing data generated by the two respective

experimental methodologies, with D values ranging from 0.88 to 2.2 min. The results indicate that experimental methodologies and data processing methods can significantly impact reported inactivation parameters, even when using identical cultures and food materials, supporting the importance of fully disclosing methodology details and considering standardization of methodologies.

ROLE OF PILLI IN BIOFILM FORMATION AMONG CLINICAL STRAINS OF GROUP B STREPTOCOCCUS (GBS)
Cassandra Martin
Category: Microbiology, Immunology and Infectious Disease, Section 1
Poster #: 273
Location: Gold Room, 9:30 AM - 11:30 AM
Mentor(s): Shannon Manning (Microbiology and Molecular Genetics)

GBS causes neonatal meningitis and is emerging among the elderly. Molecular epidemiological analyses have identified some GBS clonal complexes (CCs) to be associated with disease and asymptomatic colonization. Biofilm formation is important for the colonization of many pathogens and GBS pilus structures are thought to play a role in this process. Screening for the presence of 3 distinct pilus types was performed on 124 clinical GBS strains using multiplex PCR. Next, Biofilm assays were conducted to determine the differential ability of strains to form biofilms based on the type of pili they carry and their clonal affiliation. Clinical GBS strains commonly carried pilus type 1 in addition to pilus type 2a or 2b. Overall, a high degree of variability was observed in the biofilm formation among strains. Strains harboring pilus type 1 and 2a had slightly higher biofilm formation relative to those strains harboring pilus type 1 and 2b ($p = 0.11$). The average biofilm production of CC-1 (avg. = 0.56) and CC-23 (avg. = 0.60), was higher than that observed in CC-17 (avg. = 0.31). The distribution of pilus types varies among GBS strains with varying clinical phenotypes and is correlated with the clonal complex. Nevertheless, our results indicate there are likely other factors in addition to pili that contribute to differences in biofilm formation among GBS strains. Future work will focus on determining whether differential expression of pili genes has an effect on biofilms.

PILUS ISLAND DISTRIBUTION AMONG HUMAN AND BOVINE GROUP B STREPTOCOCCUS (GBS)
Samantha Wengert
Category: Microbiology, Immunology and Infectious Disease, Section 1
Poster #: 274
Location: Gold Room, 9:30 AM - 11:30 AM
Mentor(s): Shannon Manning (Microbiology and Molecular Genetics)

Group B Streptococcus (GBS) is a Gram-positive pathogen that causes sepsis and meningitis in newborns, and mastitis in bovines. Multilocus sequence typing has previously identified specific GBS sequence types (STs) to be associated with neonatal disease (ST-17 and ST-19), asymptomatic colonization (ST-1 and ST-23), and bovine mastitis (ST-61 and ST-67). GBS strains contain three horizontally acquired genomic islands including PI-1, PI-2a, and PI-2b, which play an important role in bacterial pathogenesis. A multiplex PCR targeting conserved genes within each PI was used to examine their presence among 295 GBS strains. Strains lacking PI-1 were also examined for the presence of an intact PI integration site via PCR. We determined the distribution of each pilus island by source and phylogenetic relationship. All 295 GBS strains contained at least one PI. The majority of human clinical strains (83%) contained both PI-1 and either PI-2a or PI-2b, whereas most bovine strains (86%) lacked PI-1 and carried PI-2b. Among the strains negative for PI-1, 16 lacked an intact integration site; all isolated from bovines. Variation in the pili present in GBS strains isolated from distinct sources suggests that pilus structures are important for host specificity and niche adaptation. Predominance of PI-1 in human versus bovine strains suggests that this pilus type is likely important for colonization and disease in humans. From an evolutionary standpoint these findings are notable because the most virulent ST-17 GBS strains were suggested to have originated from a bovine ancestor.

CHARACTERIZATION OF THE HUMAN GUT MICROBIOME
Lillian Jensen
Category: Microbiology, Immunology and Infectious Disease, Section 1
Poster #: 275
Location: Gold Room, 9:30 AM - 11:30 AM
Mentor(s): Jennifer Auchtung (Microbiology), Robert Britton (Microbiology), Donna Koslowsky (Microbiology)

Clostridium difficile is a common nosocomial pathogen. Many hospitalized patients treated with antibiotics develop C. difficile infections. Because antibiotics affect the normal human microbiome, it is thought that the disrupted gut microflora provides an

opportunity for C. difficile to colonize and infect. Isolation and characterization of species from the healthy human gut microbiome may provide insights into how the healthy microbial gut community prevents C. difficile infection. We have used a variety of different selective media to isolate anaerobic species originating from human fecal matter. Thus far, we have collected more than 100 isolates and are in the process of collecting additional isolates. We are in the process of determining the identity of these isolates by sequencing the 16S rRNA genes. We also plan to characterize the growth characteristics of different isolates as well as determine the ability of single isolates and combinations of isolates to inhibit growth of C. difficile in culture. The long-term goal of this project is to identify a combination of isolates that effectively inhibit C. difficile growth and pathogenesis. Once identified, it may be possible to use these isolates as an effective treatment for C. difficile infections in patients. This research is supported in part by the UBM award from NSF.

CAMPYLOBACTER JEJUNI

Jennifer Beebe

Category: Microbiology, Immunology and Infectious Disease, Section 1
Poster #: 276
Location: Gold Room, 9:30 AM - 11:30 AM
Mentor(s): Terence Marsh (Microbiology & Molecular Genetics)

Gastroenteritis is a major problem in modern public health. Campylobacter Jejuni is one of the most common causes of this illness in the world. Every year there are more than 2 million cases of infection in the US alone. Campylobacter is spread by consuming items that have been contaminated with feces from infected animals or people. For the research project, we developed a rapid PCR based identification of Campylobacter Jejuni in order to isolate samples for testing. Of 18 samples taken from bovine feces, 8 tested positive for Campylobacter Jejuni. These samples are now being used to compare the genomic structure of our samples to human isolates in hopes of finding markers that reflect pathogenicity. The ability to quickly identify infections and sources will lead to decreased incidence of infections and earlier treatment of those already infected.

GLOBAL GENE KNOCK-OUT STUDIES REVEAL ESSENTIAL LYS-R TRANSCRIPTIONAL REGULATORS IN MYXOCOCCUS XANTHU

Katelyn Nguyen, Emily Martinez

Category: Microbiology, Immunology and Infectious Disease, Section 1
Poster #: 277
Location: Gold Room, 9:30 AM - 11:30 AM
Mentor(s): Poorna Viswanathan (Microbiology and Molecular Biology)

Myxococcus xanthus is a gram-negative bacterium commonly found in soil. It is used as a model organism to study social interactions and development under starvation conditions. Upon starvation, approximately 105 rod-shaped cells transform into a complex fruiting body with spherical myxospores. These developmental processes depend on inter- and intracellular signals as well as a cascade of transcriptional factors that temporally and spatially control gene expression. LysR-type transcriptional regulators (LTTRs) are highly conserved and the most abundant transcriptional regulators in the prokaryotic kingdom. LTTRs are regarded as global transcriptional regulators that act as either activators or repressors of single or operonic genes. In the M. xanthus genome, there are twenty-five genes that are annotated as LTTRs. One of them, LysR-type activator of dev (LAD), was previously found to be essential for M. xanthus development. Gene knock-out mutants of M. xanthus DK 1622 were generated in this study as the first step to determine if any or all of the remaining twenty-four LTTR coding genes were important for growth and development. Primers were designed to amplify 400 bp regions of each target gene which were then amplified using PCR, gel purified, and inserted into TOPO cloning vector for replication in E. coli. The plasmids were then extracted, sequenced, and transformed into M. xanthus. All twenty-four mutants were screened on kanamycin containing media and further identified using a colony PCR method. Preliminary results from growth and development studies in three of these mutants indicate that they are essential for M. xanthus development.

DEMONSTRATION OF A BACTERIAL ENDOSYMBIONT IN TRICHURIS MURIS
Allison Nipper
Category: Microbiology, Immunology and Infectious Disease, Section 2
Poster #: 280
Location: Gold Room, 1:30 PM - 3:30 PM
Mentor(s): Linda Mansfield (Large Animal Clincal Sciences)

An endosymbionic relationship is defined by the residence of one organism inside another organism. In the case of bacterial endosymbionts, the bacteria may even live within the cells of the larger organism. Current research in our lab aims to demonstrate a potential bacterial endosymbiont of Trichuris muris, a helminthic parasite found in mice. Interest in T. muris stems from the use of T. muris infected mice as a model for human infection with Trichuris suis to treat Irritable Bowel Disease. While this treatment is yet to be approved by the Food and Drug Administration, research from our lab hopes to address potential hazards of helminthic therapy. Were T. muris to possess a bacterial endosymbiont, antibiotic treatment could eradicate the bacteria, consequentially killing T. muris. Applied to a clinical setting, this model could be used to rid patients of parasitic worm infections through antibiotic treatment. In my research, PCR analysis was used to compare DNA extracted from T. muris eggs in relation to both the species specific and universal regions of bacterial 16S DNA. Based on ongoing experiments, as well as previous results from our lab, it is possible some strains of T. muris possess an endosymbiont.

PILOT-SCALE VALIDATION OF A SALMONELLA THERMAL INACTIVATION MODEL IN GROUND MEAT PATTIES
Jessica Emery
Category: Microbiology, Immunology and Infectious Disease, Section 2
Poster #: 281
Location: Gold Room, 1:30 PM - 3:30 PM
Mentor(s): Bradley Marks (Biosystems and Agricultural Engineering)

Microbial inactivation models are used in the meat industry to predict Salmonella lethality for cooked products. Such models are typically based on laboratory-scale studies, but application to commercially-relevant processes has not been rigorously evaluated. The objective of this study was to quantify accuracy and uncertainty of a log-linear inactivation model, given parameters determined via isothermal laboratory studies, applied to pilot-scale tests in a continuous cooking system. Ground pork, beef, and turkey were inoculated with an 8-serovar Salmonella cocktail. Inoculated product was formed into patties and cooked using a pilot-scale, moist-air impingement oven under commercially relevant conditions. Core temperatures were recorded real-time during processing, and Salmonella inactivation was calculated using previously reported inactivation parameters. Patties (n = 63) were removed from the oven at pre-determined core temperatures, rapidly cooled in liquid nitrogen, and sliced into three layers and cored (50 mm diam, 4 mm thick). Cores were serially diluted and plated to enumerate survivors. Lethality error was defined as the difference between experimental and predicted log reductions. The root mean squared errors (RMSEs) for the predicted lethalities in ground beef, pork, and turkey were 2.3, 2.4, and 2.5 log (CFU/g), respectively, which were 135-539% greater than the RMSEs in the isothermal laboratory studies that yielded the model parameters. In the same products, the mean errors (biases) were 0.24, 1.09, and 1.91 log (CFU/g), respectively, representing over-predictions of lethality. Overall, the increase in uncertainty between laboratory and pilot or commercial-scale lethality results should be considered when applying inactivation models to process validations.

CHARACTERIZATION OF RESIDENT PSEUDOMONADS IN ARABADOPSIS THALLIANA
Kevin Nehil
Category: Microbiology, Immunology and Infectious Disease, Section 2
Poster #: 283
Location: Gold Room, 1:30 PM - 3:30 PM
Mentor(s): Sheng Yang He (Plant Research Laboratory)

The relationship between resident microbiota within higher organisms are not always parasitic or detrimental, but can be commensal or beneficial to the host. In this study, we isolated 116 resident bacteria from Arabadopsis thalliana leaf tissue, and identified over 400 operational taxonomic units (OTUs) of leaf-associated bacteria using 16S rRNA gene-targeted pyrosequencing. Provided plants have a robust innate immune system and myriad of defense mechanisms to combat infection, the ability of these microorganisms to live in such close association with Arabodopsis remains a mystery. A number of culturable isolates we obtained have 95-99% 16S rRNA gene identity to virulent plant pathogen Pseudomonas syringae. The aim of this study is to elucidate intimate interactions of 12 Pseudomonas foliage isolates with Arabidopsis, with particular focus on plant innate immunity and mechanisms of secretion by the Pseudomonads. Pseudomonas syringae p.v. tomato DC 3000 is a

well studied microbe, virulent for a number of plant species, including agricultural crops such as tomatoes. Once Pseudomonas syringae enters plant tissue it is able to suppress the plant's immune response by secreting effector proteins which in turn block the plants immune defenses, allowing the bacteria to colonize intercellularly. Eventually plant immune responses overtake bacterial evasion and the resulting phenotype is chlorosis and necrosis of leaf tissue. Understanding what interactions occur between leaf isolate Pseudomonads and Arabadopsis thalliana is a first step in understanding what differences allow these close relatives to Pseudomonas syringae to take residence within their host.

ENDOTOXIN-INDUCED MODULATION OF ALLERGIC AIRWAY DISEASE IS MEDIATED BY NFKB
Chanel Redden
Category: Microbiology, Immunology and Infectious Disease, Section 2
Poster #: 284
Location: Gold Room, 1:30 PM - 3:30 PM
Mentor(s): Daven Jackson-Humbles (Pathobiology and Diagnostic Investigation), James Wagner (Pathobiology and Diagnostic Investigation)

Asthma is a chronic disease characterized by airway reactivity, inflammation and mucus hyperproduction. Inhalation of endotoxin (lipopolysaccharide; LPS) an inflammagen derived from Gram negative bacteria, can exacerbate asthma symptoms. Using a mouse asthma model that employs ovalbumin as an allergen, we explored the role of NFκB, a key promototer of inflammation, in the enhancement of allergic responses by endotoxin. Male BALB/c mice were sensitized to ovalbumin on Day 1, boosted on Day 10 and then challenged with OVA on Days 17 and 18 to induce allergic airway responses. On Day 20 mice were treated with an NF?B inhibitor 1 hour prior to airway administration 3µg LPS. Changes in pulmonary function were determined and necropsy was performed on Day 21. To assess pulmonary function mice were intubated and ventilated using a flexiVent respiratory mechanics system (SCIREQ, Montreal, Quebec, Canada). A dose-response curve was generated with increasing doses of aerosolized methacholine, to induce lung resistance and assess (hyperreactivity). Lungs were lavaged with saline to collect bronchoalveolar lavage fluid (BALF) and processed for cytological evaluation, total protein, and mucin glycoproteins. Allergic mice had airway hyperreactivity and increases in BALF enosinophils and neurophils. Endotoxin causes airway hyperreactivity in non-allergic, but not in allergic mice, but enhanced allergic neutrophil responses. Inhibition of NFκB caused divergent effects on airway reactivity, with dramatic enhancement in endotoxin responses, but complete inhibition of allergen effects. These studies reveal pathways of environmental enhancement of allergic responses in a relevant animal model.

A SYMBIOTIC HYPOTHESIS FOR CHEMICAL COMMUNICATION IN THE BROWN HYENA
Emily Schmitt-Matzen
Category: Microbiology, Immunology and Infectious Disease, Section 2
Poster #: 285
Location: Gold Room, 1:30 PM - 3:30 PM
Mentor(s): Thomas Schmidt (Microbiology and Molecular Genetics)

All animals harbor diverse communities of symbiotic microbes that have the potential to profoundly affect host biology, including hosts' behaviors. One aspect of animal behavior to which symbiotic microbes may contribute greatly is chemical communication, especially among mammals. Many mammals communicate by scent marking with products of specialized glands that appear highly conducive to bacterial proliferation. It has been postulated that mammals co-opt the odorous products of symbiotic bacterial metabolism for communication, and that variation in mammalian chemical signals is often due to underlying variation in the structures of their bacterial communities. Although this hypothesis has been largely presumed for a half-century, its evaluation has been hindered by our inability to effectively characterize the bacterial communities inhabiting the scent marks of mammals. In this study, we employed next generation sequencing technology to begin evaluating this model in the brown hyena. Brown hyenas are medium-sized carnivores found throughout much of Southern Africa. They typically live in small, family groups and their territories are maintained by frequent marking of communal scent posts with anal scent pouch secretions, or "paste." We collected scent posts—and complementary controls—from 6 populations of brown hyenas in Namibia. We visualized the bacterial communities associated with hyena scent posts via scanning electron microscopy, and characterized the diversity of bacteria inhabiting hyena scent posts through 16S rDNA surveys (454 platform). We then incorporated sequences from bacterial types in our study into a phylogeny with bacterial type strains to elucidate the metabolic (i.e. odorant) potential of these bacteria.

TRICKY TRICHS: DEVELOPING A DIAGNOSTIC POLYCLONAL ANTI-T. FOETUS ANTIBODY
Melissa Tatro
Category: Microbiology, Immunology and Infectious Disease, Section 2
Poster #: 286
Location: Gold Room, 1:30 PM - 3:30 PM
Mentor(s): Dalen Agnew (Pathobiology and Diagnostic Investigation)

Tritrichomonas foetus is a multi-organ pathogen, found in the reproductive system of bovine and in the digestive tract of other species. *Tritrichomonas foetus* is known to cause chronic diarrhea in cats, and similar trichomonads are known to affect the digestive systems of laboratory animals such as mice, rats, guinea pigs, and primates; farmed, pet, and wild birds; and zoo animals, such as giant anteaters. In order to keep laboratory and farm animals healthy and ensure the successful conservation of species like the giant anteater, a diagnostic tool for trichomonad infection is needed. We hypothesize that a polyclonal anti-*T. foetus* antibody will detect closely related trichomonads in other species. A polyclonal antibody was created by inoculation of rabbits with formalin-fixed *T. foetus.* Rabbit serum was collected, purified by liquid chromatography, and the resulting antibody validated in a *T. foetus*- infected bovine uterus via immunohistochemistry. The antibody showed robust staining of *T. foetus* organisms with minimal cross-reactivity in host tissues. This antibody is currently being tested in several novel target species, including anteater, turkey, mouse, and rat. The anti- *T. foetus* antibody created in our laboratory could serve as an important diagnostic tool in other laboratories.

QUANTIFICATION OF CYCLIC DI-GMP SIGNALING SPECIFICITY THE PATHOGEN VIBRIO CHOLERAE
Evan Reynolds
Category: Microbiology, Immunology and Infectious Disease, Section 2
Poster #: 287
Location: Gold Room, 1:30 PM - 3:30 PM
Mentor(s): Chris Waters (Microbiology & Molecular Genetics)

Cyclic di-GMP (c-di-GMP) is a second messenger molecule widespread in bacteria. C-di-GMP mediates the formation of multicellular communities of bacteria known as biofilms and represses behaviors associated with motile lifestyles. In the human pathogen Vibrio cholerae, c-di-GMP has been shown to regulate transcription, motility and biofilm formation. V. cholerae encodes 40 different individual diguanylate cyclase (DGC) which synthesizes c-di-GMP. Since multiple DGCs contribute to the overall c-di-GMP pool, it is not clear whether this system functions via high or low specificity. A high specificity system is characterized by DGCs that are specifically related to different downstream phenotypes via signaling pathways. Alternatively, in a low specificity system the DGCs alter a general signal pool which then regulates all of the different phenotypic responses. To determine whether or not c-di-GMP functions with high or low specificity we quantified biofilm formation and transcription induction at multiple in vivo c-di-GMP concentrations using seven different DGCs. We hypothesize that if c-di-GMP functions by low specificity, we would be able to create a model using linear regression analysis for all the data which would fit almost as well as the linear fit model for each individual DGC. If the system is highly specific the model incorporating all the data would not fit as well as models for each individual DGC. Using statistical analysis of each phenotype we see much better fitting linear models within each individual DGC then for the entire set of data, thus signifying that c-di-GMP signaling in V. choleraeis highly specific.

CHARACTERIZATION OF PROMOTERS WITHIN THE EXTRACELLULAR PROTEIN SECRETION OPERON OF VIBRIO CHOLERAE
Ashley Konal
Category: Microbiology, Immunology and Infectious Disease, Section 3
Poster #: 290
Location: Gold Room, 1:30 PM - 3:30 PM
Mentor(s): Donna Koslowsky (Microbiology and Molecular Genetics), Chris Waters (Microbiology and Molecular Genetics)

Vibrio cholerae secretes cholera toxin, proteases, and other substances essential for the survival of the cell via a type II secretion system (T2SS). The T2SS is comprised of an intra-membrane structure encoded by the extracellular protein secretion (eps) operon. Our lab has shown that upon both over-expression of epsG and under physiological conditions, a type IV-like pilus assembles on the outer surface of the cell. This “pseudo-pilus” appears to contribute to biofilm formation, a complex bacterial behavior controlled by quorum sensing. The creation of a genomic library identified a putative promoter in the middle of the eps operon, termed 6f12, which occupies most of epsF and extends into part of epsG. Identification of this promoter suggests differential regulation of eps genes and thus an additional role of these genes. In this study, I sought to compare regulation of 6f12 and a promoter I identified upstream of the first gene in the operon, epsC, which likely drives expression of the entire

operon. Fragments of each promoter generated by cutting in from the 5' and 3' ends were cloned into a vector containing the lux operon to determine the boundaries of each promoter, and transcription start sites were determined using a Rapid Amplification of cDNA Ends (RACE) assay. The promoter constructs were transformed into V. cholerae quorum sensing mutants and assayed in the presence of over-expression vectors, and luminescence levels were measured in order to elucidate regulation of both promoters.

TRANSLATIONAL REGULATION OF THE HUNTINGTON'S DISEASE PROTEIN THROUGH A 5' UPSTREAM OPEN READING FRAM
Jonathan Massie
Category: Microbiology, Immunology and Infectious Disease, Section 3
Poster #: 291
Location: Gold Room, 1:30 PM - 3:30 PM
Mentor(s): Naoko Tanese (Microbiology)

5' upstream open reading frames (5'uORFs) are short potential polypeptide coding regions located on major gene transcripts, upstream of the major gene encoding region. Recent evidence suggests that 5'uORFs have an inhibitory translational effect on the downstream major open reading frame product. In this study we investigated the 5'uORF of the Huntington's disease causing protein, Huntingtin (Htt). Mutant forms of the Htt protein with polyglutaimine (polyQ) regions containing over 35 glutamines near the N-terminus are indicative of Huntington's disease. Here we study the Htt 5'uORF's effect on both wildtype and mutant Htt in hopes of determining whether there is selective inhibition of the mutant Htt protein.

ANALYSIS OF ANAEROBIC DIGESTION CHAMBER AND THE ARCHAEA COMMUNITY THAT POPULATES IT.
Rachael Rossi
Category: Microbiology, Immunology and Infectious Disease, Section 3
Poster #: 292
Location: Gold Room, 1:30 PM - 3:30 PM
Mentor(s): Terence Marsh (Microbiology and Molecular Genetics)

The Department of Agriculture Engineering at Michigan State University is under the process or developing a large-scale anaerobic digestion chamber that will be used for educational purposes, and for development of new ways to recycle agricultural waste in ways that are environmentally safe. The objective is to reduce green house gas emissions of the waste using bioremediation. One of the main components of bioremediation is an anaerobic digestion chamber that breaks down cow manure into nitrogen and phosphorus, which are then used by algal ponds to produce biofuels. A variety of small-scale anaerobic digestion chambers have been use to study how the addition of corn stover to dairy manure will effect the digestion process over different periods of time. Along with the production of nitrogen and phosphorus there is a large output of methane. The focus of this study is to get an overall understanding as to what microorganisms, within the archaea kingdom, make up the community in these anaerobic digestion chambers. It is expected that the majority of the archaea are found in the phylum Euryarcheaota, and that the archaea community composition changes depending on the addition of corn stover and digestion time period. This theory is based on the anaerobic conditions of the digestion chamber and large production of methane gas.

INHIBITION OF LARVAL MOSQUITO (DIPTERA: CULICIDAE) GROWTH CAUSED BY FUNGI FOUND WITH SENESCENT LEAF
Craig Bateman, Brian Lovett
Category: Microbiology, Immunology and Infectious Disease, Section 3
Poster #: 293
Location: Gold Room, 1:30 PM - 3:30 PM
Mentor(s): Michael Kaufman (Entomology)

Culex pipiens, the Northern House Mosquito, is an important vector of St. Louis encephalitis and West Nile virus, making the ecology of this mosquito important for medical and economic health. Of particular ecological significance, are pathogens affecting C. pipiens, due to the possibility of their use as a biological control agent. We have found that the presence of ground-collected Sugar Maple (Acer saccharum) leaves inhibited growth and eventually caused mortality of another container-breeding mosquito, A. triseriatus. In the experiment, the death of the mosquito larvae occurred in conjunction with the presence of filamentous hyphae, presumably introduced from the maple leaves. This, with support from DNA sequencing, indicated that the causative agent of growth inhibition in the mosquitoes was likely caused by a fungus or fungal like organism, e.g., Oomycota. Fungal organisms were isolated by use of selective media and baiting techniques, and will be used in a bioassay to determine

their virulence to C. pipiens larvae. Following this, we will characterize any organisms found to inhibit mosquito growth. This will help us determine the mode of action for any mosquito-virulent organisms found, as well as offering potential for more effective mosquito control, and thus disease control, tactics.

A SYMBIOTIC APPROACH TO THE STUDY OF ANIMAL COMMUNICATION
Jacquelyn Dycus
Category: Microbiology, Immunology and Infectious Disease, Section 3
Poster #: 294
Location: Gold Room, 1:30 PM - 3:30 PM
Mentor(s): Thomas Schmidt (Microbiology and Molecular Genetics)

Animals are hosts to a variety of symbiotic microbes that affect their health and behavior. One aspect of animal behavior that symbiotic microbes may significantly influence is chemical communication, especially among mammals. Many mammals communicate by scent-marking with the products of specialized glands that seem to provide an ideal environment for bacterial proliferation. It has been postulated that the volatile odorants generated by bacterial metabolism are utilized by mammals for communication, and that variation in mammalian chemical signals could be due to underlying variation in the structures of their bacterial communities. This project aims to elucidate the effects of symbiotic bacteria on the scent-marking system of the wild spotted hyena. To determine the bacterial communities inhabiting hyena scent pouches, we used 16S rRNA gene surveys. These surveys revealed that scent pouches are primarily populated by obligate or facultative anaerobes from the genera Anaerococcus, Anaerovorax, Corynebacterium, Eubacterium, Fastidiosipila, Helcococcus, Porphyromonas and Propionibacterium, which may produce the diverse array of short-chain fatty acids comprising the primary odorants of hyena scent pouch secretions. We subsequently designed a cultivation medium that mimicked the chemical environment of the hyena scent pouch and met the nutritional requirements of resident microbes. We also cultivated bacteria from the scent pouches under both hypoxic and anoxic conditions, de-replicated the cultivated bacterial types, and characterized their respiratory and fermentative metabolic end products using high-performance liquid chromatography. These analyses confirmed that hyena scent pouch bacteria do in fact generate a diverse array of short-chain fatty acids and other odorous metabolites.

DNA EXTRACTION: MANUAL OR AUTOMATED?
Madison Operacz
Category: Microbiology, Immunology and Infectious Disease, Section 3
Poster #: 295
Location: Gold Room, 1:30 PM - 3:30 PM
Mentor(s): Roger Maes (Microbiology)

The purpose of this experiment is to compare the accuracy and efficiency of manual extraction of deoxyribonucleic acid (DNA) with the extraction by the QiaCube, an automated method of extraction, while testing for the c-kit mutation. C-kit is a gene that codes for the KIT protein, which activates cell growth and division. To test for a mutation in the KIT protein, DNA is extracted from a suspected mast cell tumor to determine if the animal has a mutation in the c-kit gene. Manual extractions require a laboratory technician to perform all the steps involved in the protocol, while the QiaCube can be loaded and left unattended until the extraction procedure is completed. In the QiaCube, there are spaces for up to 12 samples, while manual extraction does not have a limited number of samples. The results of the study demonstrate that the automated method of extraction was better than the manual method, consistently showing crisp, concise bands in the agarose gels and less inhibition was shown with the number of samples run.

CHARACTERIZATION OF THE SECRETED ENZYME XYLANASE, ISOLATED FROM FLAVOBACTERIUM JOHNSONIAE
Kerri Miazgowicz
Category: Microbiology, Immunology and Infectious Disease, Section 3
Poster #: 296
Location: Gold Room, 1:30 PM - 3:30 PM
Mentor(s): Edward Walker (Microbiology & Molecular Genetics)

Characterization of the secreted enzyme xylanase, isolated from the bacteria Flavobacterium johnsoniae after genetic manipulation. Biochemical characterization of the secreted xylanse was completed. Xylanase activity was determined for optimal pH, pH stability, optimal temperature, therm-stability, kinetic determination, as well as in the presence of metal ions. Xylanase is a promising candidate for various industrial applications such as biofuel, food, paper and the pulp industry.

LIFE STYLE SWITCH AND PERSISTENCE OF PHOTORHABDUS LUMINESCENS
Alexander Martin
Category: Microbiology, Immunology and Infectious Disease, Section 3
Poster #: 297
Location: Gold Room, 1:30 PM - 3:30 PM
Mentor(s): Todd Ciche (Microbiology and Molecular Genetics)

The bacterium Photorhabdus luminescens is an obligate symbiont of the nematode Heterorhabditis bacteriophora. Nematode and bacteria work together in a sophisticated symbiosis to infect and kill insects. Our lab observed that Photorhabdus is capable of switching phenotype, from a wild type (primary) to a Small Colony phenotype (SC). The SC is required for symbiosis with the nematode, while the primary form is pathogenic to insects. We have made many exciting discoveries investigating the differences between the two phenotypes such as color, size, growth rate, secondary metabolite production, even bioluminescence. This research is possible because we have genetically engineered strains that are locked as either primary or SC, meaning the bacterium cannot switch between the two phenotypes. Primary cells take 2.45 hours/division compared to 4.3 hours/division for SC cells. The competition index assays show that primary cells are 106 times more competitive than SC. I have also demonstrated that SC harbor more persister cells than the primary form. Persister cells are described as the dormant cells that survive stress such as antibiotics, and constitute a small percentage of the total population. These cells are important in recurrent clinical infections. SC cells are composed of more persister cells than the primary form through several experiments such as Minimum Inhibitory Concentration (MIC) and antibiotic tolerance testing with Ciprofloxacin 49.3 fold, and Streptomycin 8.7 fold, fluoroquinolone and aminoglycoside respectively. I have contributed this research in a paper that is currently under review in Science Magazine.

DETERMINING THE PARASITISM-INDUCING MOLECULAR CUE IN INSECT HEMOLYMPH FOR HETEROHABDITIS BACTERIOPHORA
Alexander Martin
Category: Microbiology, Immunology and Infectious Disease, Section 3
Poster #: 298
Location: Gold Room, 1:30 PM - 3:30 PM
Mentor(s): Todd Ciche (Microbiology and Molecular Genetics)

More than a hundred species of nematodes are parasitic to more than a quarter of the human population. The enteropathogenic nematode Heterorhabditis bacteriophora is symbiotic to the bacterium Photorhabdus luminescens that inhabits its gut. Nematode and bacteria work together in a highly evolved balance between symbiosis, which allows the pair to survive, and pathogenesis, which allows the pair to infect and kill insects. Many nematode parasites, including those parasitic to vertebrate hosts as well as humans, infect the host by a developmentally arrested and alternate third larval stage called an infective juvenile (IJ). The process of exiting from IJ diapause and induction of parasitism is easily studied in H. bacteriophora because symbiont bacteria are regurgitated. Once an IJ is inside the insect, the nematode regurgitates Photorhabdus into the insect hemolymph, shutting down the insect's immune system in 24 hours. Thus, induction of parasitism by Heterorhabditis is easily assayed by monitoring the release of bacteria. There is an unknown cue in the insect hemolymph that triggers this regurgitation behavior. The cue is present in most insect blood but not human blood, also that the compound is heat stable and polar. The Ciche lab has been collaborating with Dr. Jason Crawford in the Clardy lab at Harvard Medical School to fractionate and identify the parasitism-inducing cue from 120 insect hemolymph fractions. Discovering the trigger to regurgitation and dauer recovery is imperative to further the study of infection.

Physical Sciences

Poster Presentations

BETA-DECAY Q-VALUE MEASUREMENTS FOR ASTROPHYSICS
Brittany Abromeit
Category: Physical Sciences, Section 1
Poster #: 301
Location: Parlor A, 9:30 AM - 11:30 AM
Mentor(s): Sean Liddick (National Superconducting Cyclotron Laboratory/Chemistry)

The rapid neutron process is responsible for the creation of approximately half of the neutron-rich heavy elements above iron. The path of the r-process depends sensitively on the nuclear masses of the isotopes involved. R-process calculations use masses extracted from global theoretical models. To better constrain the r-process path, the beta-decay of neutron-rich nuclei are studied. The beta-decay Q value can be extracted from a measurement of the beta-decay electron energy distribution, providing the relative mass between the parent and daughter isotope. The NSCL has a successful beta-decay spectroscopy station consisting of a 1-cm thick germanium detector. To determine the sensitivity of the system for beta-decay Q value, the system will be simulated with Geant4 and compared with a measurement of one 1-cm thick germanium detector and a pure beta emitter, 90Sr. The comparison between the experimental and simulated beta-decay spectrum, as well as the outlook for Q value measurements with the device, will be presented.

DESIGN OF HIGH-BRIGHTNESS PHOTOEMISSION GUN FOR ULTRAFAST ELECTRON MICROSCOPE
Austin Lo, Hilary Egan
Category: Physical Sciences, Section 1
Poster #: 302
Location: Parlor A, 9:30 AM - 11:30 AM
Mentor(s): Chong Yu Ruan (Physics)

The development of an ultrafast electron microscope will allow the resolution of the atomic and molecular reaction dynamics to be taken to the fundamental length and time scales. A significant challenge lies in generating an ultra-bright photoelectron beam capable of single-shot studies of structural dynamics at high resolutions. The first major obstacle in achieving this is to couple a femtosecond laser to a microscope capable of delivering a high-brightness photoelectron beam in a compact geometry in the electron microscope beam column. The complexity of the situation arises from attempting simultaneous compression of the beam's width and length. Such implementation requires a major redesign of the lensing and steering systems in the conventional electron microscope, as these systems will also need to work with a radio-frequency (RF) compressor, which controls the electron beam's pulse-width. Here, we present our effort in achieving the electron gun design with a tunable femtosecond (fs) ultraviolet (UV) laser source to control the initial phase space of photoemission and reduce the space-charge effects that prohibit the desired resolutions.

STUDIES OF PLASMONIC-ENHANCED PROCESSES USING ULTRAFAST DIFFRACTION AND VOLTAMMETRY TECHNIQUES
Thiago Szymanski
Category: Physical Sciences, Section 1
Poster #: 303
Location: Parlor A, 9:30 AM - 11:30 AM
Mentor(s): Chong-Yu Ruan (Physics and Astronomy)

We seek to understand the enhancement effect of the nanoparticle plasmonic network, which can be used to assist photo-chemical and photo-physical processes on the surface of nanoparticle networks. The surface plasmonic resonance (SPR) phenomena on a single particle level is well understood, but the study in a multi-particle regime of interactions between plasmonic fields from different particles can lead to the discovery of new resonance structures in the frequency and spatial domains. Using colloidal chemistry techniques, we prepare and deposit gold nanoparticles of varying diameters on silicon chips. Through the use of ultrafast diffraction and voltammetry measurements on the prepared samples to monitor the transient response, we determine the photo-thermal and photo-electrical response as a function of particle size and inter-particle distance. These efforts help address the ongoing debate on the role of the inter-particle plasmonic resonance, which so far, has

only been described in the optical domain, but not in terms of the physical response. The description of the plasmonic network's physical response is crucial for various applications ranging from induced reactions, catalysis, and nano-electronics.

GRAIN ELONGATION ANALYSIS OF SAND- AND SILT-SIZE SEDIMENT AT THE PHOENIX MARS LANDER LANDING SITE FROM IMAGES ACQUIRED BY THE PHOENIX OPTICAL MICROSCOPE

Kathryn Blok, Alexander Dietrich, Arjun Kalra, Jason Schreiber

Category: Physical Sciences, Section 1
Poster #: 304
Location: Parlor A, 9:30 AM - 11:30 AM
Mentor(s): M.A. Velbel (Geological Sciences)

The Phoenix Mars Lander landed in Vastitas Borealis, near Mars' northern polar cap, on May 25, 2008, and operated until November 2, 2008. The landing site is in a valley dominated by periglacial polygonal patterned ground. A Robotic Arm (RA) dug trenches and acquired samples of dry soil and sublimation residues from water ice. The RA delivered samples to several instrument packages containing a variety of scientific instruments, including an Optical Microscope (OM). The OM was an imager with a fixed-focus, fixed-magnification optical system, two lenses, and LEDs in red, blue, green and ultraviolet for simulating color imaging. Substrates composed of silicon, micro buckets, strong magnets, and weak magnets were distributed on a rotating wheel the movement of which enabled the OM to photograph each sample individually and focus. This project re-examines grain shapes in Phoenix samples, specifically Sorceress and Wicked Witch, using quantitative rather than qualitative shape measures. The Sorceress and Wicked Witch samples were taken from a scrape pile above permafrost ice in the center of a periglacial polygon. Our process will be to identify the most accurate quantitative measures for elongation grain shape (based on previous published works by Yingst and Cabrol) and compare the results of each sample to determine similarities or differences in grain elongation depending on the location of the sample taken.

EFFECT OF ALIPHATIC DICARBOXYLATE TETHER ON TOPOLOGY IN LUMINESCENT CADMIUM COORDINATION POLYMERS CONTAINING BIS(4-PYRIDYLFORMYL) PIPERAZINE

Amy Pochodylo

Category: Physical Sciences, Section 1
Poster #: 305
Location: Parlor A, 9:30 AM - 11:30 AM
Mentor(s): Robert LaDuca (Lyman Briggs/Chemistry)

Hydrothermal synthesis has generated a series of cadmium aliphatic dicarboxylate coordination polymers containing the multitopic bis(4-pyridylformyl)piperazine (bpfp) neutral ligand, which were characterized by single-crystal X-ray diffraction, luminescence spectroscopy, and thermogravimetric analysis. $\{[Cd(suc)(bpfp)(H_2O)]\cdot 2H_2O\}n$ (**1** , suc = succinate) has a simple yet very rare 4-connected $6^5 8$ layered topology. $\{[Cd(dmg)(bpfp)(H_2O)]\cdot H_2O\}n$ (**2** , dmg = 2,2-dimethylglutarate) also shows a 4-connected net, but with a 3-fold interpenetrated **sra** $4^2 6^3 8$ topology. $\{[Cd(Hemg)_2(bpfp)(H_2O)]\cdot 2H_2O\}n$ (**3** , emg = 3-ethyl, 3-methylglutarate) is a simple 1-D chain coordination polymer. $\{[Cd_2(adp)(bpfp)_2(H_2O)_2](ClO_4)_2\cdot 2H_2O\}_n$ (**4** , adp = adipate) has $\{Cd_2O_2\}$ dimeric units linked by adp and exotridentate bpfp ligands into a rare (3,8)-connected **tfz-d** binodal topology. The perchlorate-free derivative $\{[Cd(adp)(bpfp)\}_n$ (**5**), has $\{Cd_2(OCO)_2\}$ clusters which link as 6-connected nodes into a primitive cubic topology.

SANDS OF MARS-GRAIN SHAPE ANALYSIS

Hilari Rhodabeck, Nathan Benton, Sarah Fagerman, Ryan Murray

Category: Physical Sciences, Section 1
Poster #: 306
Location: Parlor A, 9:30 AM - 11:30 AM
Mentor(s): M.A. Velbel (Geological Sciences)

The Phoenix Mars Lander landed in Vastitas Borealis, near Mars' northern polar cap, on May 25, 2008, and operated until November 2, 2008. The landing site is in a valley dominated by periglacial polygonal patterned ground with 3 to 6 meter polygons, with a thin layer of basaltic sand overlying permafrost. Depth to ice was 2-6 cm. A Robotic Arm (RA) dug trenches and acquired samples of dry soil and sublimation residues from water ice. The RA delivered samples to several instrument packages containing a variety of scientific instruments, including an Optical Microscope (OM). The OM was an imager with a fixed-focus, fixed-magnification optical system, two lenses, and LEDs in red, blue, green and ultraviolet for simulating color imaging.

Substrates composed of silicon, micro buckets, strong magnets, and weak magnets were distributed on a rotating wheel the movement of which enabled the OM to photograph each sample individually and focus. This presentation compares grain elongation measurements of two samples to determine if a sample sheltered under a rock is similar to, or different from, subsurface samples. The two samples are Galloping Hessian and Golden Goose. Galloping Hessian comes from the Under Headless trench (sheltered), while Golden Goose comes from Stone Soup (subsurface). Using the elongation method established by Yingst et.al. (2007, 2008, 2010), we will use the measurement results to infer different grain-formation and depositional processes, compared to data collected from other sites (both on Mars and Earth) for which both elongation and deposition and formation processes are known.

A MODEL STUDY FOR THE TOTAL SYNTHESIS OF TMC-95A
Fangyi Shen
Category: Physical Sciences, Section 2
Poster #: 310
Location: Parlor A, 1:30 PM - 3:30 PM
Mentor(s): Robert Maleczka (chemistry)

Our group has established iridium catalyzed C–H activation borylation as a significant tool for the construction of aromatic and heteroaromatic molecules. However, to the best of our knowledge the development of this chemistry for use on peptides remains an unsolved problem. To begin to fill this methodological void, we have set out to explore this chemistry in the preparation of the cyclic tripeptide TMC-95A. The TMC-95 compound family holds promise as anti-cancer agents and our synthesis would offer a green approach to novel derivatives that may possess the pharmacodynamic and pharmacokinetic properties needed to clinically employ these compounds. Just as importantly our synthesis will advance our understanding of the underlying chemistry. For example, one of my targets is to achieve a regioselectivity during the iridium catalyzed borylation of tryptophan that is relatively inaccessible via traditional routes, such as functional group-directed metalations. As part of my studies the total synthesis of TMC-95A, we have developed a model compound (which is adistinctive cyclic peptide structure composed of L-tyrosine, L-asparagine, and L-tryptophan) that represents the TMC-95 core and that will allow us to learn about the chemistry in a most efficient way.

SHAPES OF FORMERLY MOLTEN METAL-SULFIDE BEADS IN EXTENSIVELY MELTED GRAINS RETURNED FROM COMET 81P/WILD 2 FROM THE NASA STARDUST MISSION
Ellen White
Category: Physical Sciences, Section 2
Poster #: 311
Location: Parlor A, 1:30 PM - 3:30 PM
Mentor(s): Michael A Velbel (Geological Sciences)

NASA's Stardust spacecraft flew through the coma of the comet 81P/Wild. Particles from the comet were collected using an aerogel material; when the particles from the comet collided with the aerogel, the intense heat caused many of the particles to liquefy. After cooling, the particles' altered shapes were solidified. Some of the new shapes of the particles, such as dumbbells, seem to suggest that the molten drops were spinning and splitting apart while they were cooling and re-solidifying. Published images of the behavior of experimentally produced liquid drops were examined to compare their shapes to those of the Stardust particles. The shapes of experimentally produced liquid drops spinning and beginning to split apart bear a striking resemblance to the transmission electron microscope images of some of the comet particles. This was true even though the drops had different compositions from one another. The relative deformations of the drops were estimated by comparing the radius of imaged drops to the radius of a perfect sphere of the same area. This was then compared to the published results of a Spacelab experiment involving the rotational velocity and deformation of spinning liquid drops. The deformation of the Stardust particles falls within the same range as the results of the experiment, further supporting the idea that the shapes of the Stardust beads were the result of spinning while molten.

LIGAND EFFECTS ON REGIOSELECTIVITY IN C-H BORYLATIONS CATALYZED BY IRIDIUM COMPLEXES
Hongtu Zhang
Category: Physical Sciences, Section 2
Poster #: 312
Location: Parlor A, 1:30 PM - 3:30 PM
Mentor(s): Robert Maleczka (Chemistry), Milton Smith (Chemistry)

C-H bond activation has always been an interesting topic to study, owing both to the difficulty breaking this stable bond and its potential value as a green method in synthetic chemistry. Our research results indicate that the activation of aryl C(sp2)-H bonds can be achieved by treating our aromatic substrates with an iridium complex, [Ir(OMe)(COD)]2, which in turn catalyzes a borylation reaction whereby the H atom of the C-H bond is replaced with a pinacolboron substituent (BPin). The importance of preparing aryl BPin compounds is reflected in their utility in organic synthesis. Specifically, these compounds are used in cross-coupling reactions to generate new C-C and carbon_heteroatom bonds. As such bond formations are critical to the invention of new molecular entities, BPin compounds are widely valued by scientists working in drug discovery, agrochemical research, the synthesis of novel complex materials, and many other fields. In these applications, the position at which the C-H activation/borylation takes place (regioselectivity) impacts the properties of the final products. Our study shows that the ligands about the iridium can impact the regioselectivity of these processes. These findings will be presented herein.

INSIGHTS ON PROVENANCE AND SEDIMENT DISPERSAL DURING THE MIDDLE- AND LATE-STAGE DEVELOPMENT OF MIDCONTINENT RIFT SYSTEM: U-PB DETRITAL ZIRCON GEOCHRONOLOGY OF THE KEWEENAWAN SUPERGROUP
Nicole Hart
Category: Physical Sciences, Section 2
Poster #: 313
Location: Parlor A, 1:30 PM - 3:30 PM
Mentor(s): Brian Hampton (Department of Geosciences)

The application of detrital zircon geochronology is a popular approach used in tectonic-scale studies to understand provenance (source) of sand grains during evolution of sedimentary basins. Zircons originate in magmatic/plutonic systems and are extremely resistant to weathering and erosion, thus zircon sand grains can be found throughout the stratigraphic record from Precambrian-to-modern sedimentary successions. We apply U-Pb detrital zircon geochronology (i.e. U-Pb ages from individual zircon sand grains) to better understand the erosional history and provenance of the Keweenawan Supergroup of the Midcontinent Rift system. Presented here are detrital zircons of the Copper Harbor Conglomerate and Jacobsville Sandstone of northern Michigan. Both of these units are Precambrian in age and represent stratigraphic records of uplift, erosion, and sedimentation associated with middle- and late-stage continent-scale rifting of the Midcontinent, respectively. U-Pb ages from the Copper Harbor Conglomerate reveal primary occurrences of 1.1–1.2 billion-year-old (i.e. Ga) zircon grains and isolated occurrences of 1.4, 1.8, 2.1, and 2.7 Ga grains. Ages from the Jacobsville Sandstone include primary occurrences at 1.1–1.6 Ga with isolated occurrences at 1.7, 2.0, 2.7, and 2.9 Ga grains. We interpret the narrow age range (1.1–1.2 Ga) of primary occurrences from the Copper Harbor Conglomerate to reflect detrital contributions from isolated Mesoproterozoic source areas during the early-middle stages of the Midcontinent Rift system. More diverse age ranges (1.1–1.6 Ga) of the Jacobsville Sandstone are interpreted to reflect a more diverse range of source areas during final stages of rift development.

HETEROCYCLIC SYNTHESIS
Jake Ludwig
Category: Physical Sciences, Section 2
Poster #: 314
Location: Parlor A, 1:30 PM - 3:30 PM
Mentor(s): Jetze Tepe (Chemistry)

Dr. Jetze Tepe has targeted the inhibition of the proteasome enzyme in cells as a way to treat cancer. The inhibition of the proteasome enzyme will lead to the accumulation of peptide matter in the cell and will eventually lead to cell death. This inhibition can be accomplished with organic compounds of various size and functionality. Currently, small molecule proteasome inhibitors, such as Bortezomib, have been approved to treat multiple myeloma and mantle cell lymphoma. One important problem with proteasome inhibition, is finding compounds that selectively inhibit the protealytic activity of cancer cells only. This selectivity problem is currently being researched, and compounds with specific functionalities are being tested for their potency as proteosome inhibitors. Our lab has accomplished the one pot synthesis of imidazolines through the diasteroselective, 1,3-dipole cycloaddition of an oxazaolone with an imine. The oxazaolone forms a 1,3-dipolar intermediate

when reacted with a lewis acid. The lewis acid our lab uses is TMSCl. The formation of this 1,3-dipole in the presence of imine yields a diasterospecific imidazoline. The fact that this 1,3-dipolar cycloaddition can be done in one pot, allows for a large and diverse range of imidazolines to be synthesized. Our lab is specifically interested in making small functional group modifications to these imidazoline scaffolds. This specific class of imidazolines has been shown to inhibit the proteasome, and the goal is to modify them in such a way to increase their potency.

APPLYING U-PB DETRITAL GEO/THERMOCHRONOLOGY TO CONSTRAIN PROVENANCE AND THERMAL HISTORY OF PRECAMBRIAN METASEDIMENTARY STRATA FROM THE GREAT LAKES TECTONIC ZONE, NORTHERN MICHIGAN
Kraig Koroleski
Category: Physical Sciences, Section 2
Poster #: 315
Location: Parlor A, 1:30 PM - 3:30 PM
Mentor(s): Brian Hampton (Geological Sciences)

Detrital geo/thermochronology involves age-dating of individual minerals in sedimentary rocks to better understand provenance (source) of sand grains and subsequent thermal events that affected sediment after deposition. Recent field advances, specifically applied to the mineral sand grain zircon, allow for collection of U-Pb ages from 2 or more locations on an individual zircon grain (e.g. the inner core and outer rim of a grain). The assumptions for this approach are that ages from zircon cores reflect the primary age of crystallization, where ages from rims represent subsequent ages of thermal events. This approach is useful when applied to very old sedimentary sequences that have undergone numerous stages of metamorphism. Here we apply the technique to Precambrian zircon grains of the Palmer Gneiss of northern Michigan. The Palmer Gneiss is one of the oldest metasedimentary deposits in North America and it originated as a result of uplift, exhumation, and erosion associated with the Great Lakes Tectonic Zone. Analyses of zircons from the Palmer Gneiss reveal U-Pb ages from zircon cores that range in age from 2.7–3.0 billion years old. Ages from rims on the same zircon grains are much younger than the age of the Palmer Gneiss and include a range of ages from 1.0, 1.1, 1.5, and 1.8 billion years old. We interpret the old ages as the age of crystallization while younger ages represent subsequent thermal events from later tectonic events that affected the Midcontinent region.

TEXTURAL ANALYSIS OF SEDIMENTS OF THE PINETUM DUNE, MICHIGAN
Brian Glover
Category: Physical Sciences, Section 2
Poster #: 316
Location: Parlor A, 1:30 PM - 3:30 PM
Mentor(s): Michael Velbel (Geological Sciences)

Most Michigan sand dunes originated with off-shore winds transporting sand grains inland until trapped by vegetation. A recently recognized dune in mid-Michigan, the Pinetum dune on the campus of MSU, appears to have formed under different influences than most of Michigan's dunes. This paper reports textural analysis of sediment from the Pinetum dune, an inland dune on the campus of Michigan State University in East Lansing, Michigan with grains whose ages are roughly 13Ka. The possibility of significant glacial influence on grain size and shape is being investigated. The grain size distribution and grain-shape parameters are used to establish similarities and differences between the sands of the Pinetum dune, previously studied dunes, and other possible source environments for sand grains in a post-glacial dune.

PRELIMINARY U-PB DETRITAL ZIRCON AGES FROM UPPER PALEOZOIC STRATA OF THE FAREWELL TERRANE, SOUTHERN ALASKA: TESTING FOR A SIBERIAN VERSUS NORTH AMERICAN TECTONIC ORIGIN
Cody MacDonald
Category: Physical Sciences, Section 2
Poster #: 317
Location: Parlor A, 1:30 PM - 3:30 PM
Mentor(s): Brian Hampton (Geological Sciences)

The western margin of North America is made up of numerous tectonic terranes (i.e. crustal fragments) that originated in geographic regions that are very different than their present location. In the case of southern Alaska, >95% of the exposed geology consists of such terranes and many have no link with parts of North America. Provenance (source) studies on sedimentary rocks provided a powerful approach in determining the origin of these terranes. Here, we apply U-Pb detrital

zircon geochronology to constrain the paleogeographic location of the Farewell terrane throughout its transport to its present location in southern Alaska. By comparing zircon ages from sedimentary intervals of the Farwell, we can begin to understand what regions were being uplifted and eroded during the early- to late-stage development of the terrane. Samples collected from older parts of the Farewell include primary peak ages between 425–450 and 900–975 million-years-old (i.e. Ma) and at 1.4 and 1.7 billion-years-old (i.e. Ga) with isolated occurrences at 1.0, 1.8, 2.7, 3.0 Ga. The youngest parts of the Farewell terrane includes primary peak ages between 275–300, 425–450 Ma, with isolated occurrences at 650 and 950 Ma and 1.3, 1.5, 1.7, and 2.6 Ga. Preliminary interpretations of these age spectra suggest detrital contributions from source areas along the northernmost margin of North America (i.e. northern Canada). Siberia and Cordilleran sources of the western North American do not appear to have been significant detrital contributions to the Farewell terrane.

Psychology

Poster Presentations

THE ULTIMATE OUT-GROUP?: AN INVESTIGATION OF ATHEISTS' IDENTITY MANAGEMENT STRATEGIES AT WORK
Alexander Webb
Category: Psychology, Section 1
Poster #: 320
Location: Ballroom, 9:30 AM - 11:30 AM
Mentor(s): Ann Marie Ryan (Psychology)

The United States is well-known for being a place that welcomes individuals of many different religions and faiths. However, recent research (Edgell, Gerteis, and Hartmann, 2006) suggests that atheists are among the most stigmatized groups in American society. The investigator is conducting a two-study project to investigate this further. The first study surveys atheists about their personal experiences discussing their religious beliefs at work. The investigator hopes to discover what strategies atheists use to manage their social identities in this context, as well as the consequences of said strategies for both the individual and their organization. The second study will attempt to investigate the nature of discrimination against atheists by determining whether or not atheists create mortality salience in the minds of outside observers. Results will be available by the date of the conference.

MATERNAL INVOLVEMENT IN THE HOME LEARNING ENVIRONMENT AND CHILDREN'S EARLY ACADEMIC SKILLS
Bhanu Swamy, Negar Hosseinifar
Category: Psychology, Section 1
Poster #: 321
Location: Ballroom, 9:30 AM - 11:30 AM
Mentor(s): Lori Skibbe (Human Development and Family Studies)

Early literacy acquisition starts from infancy and is a crucial element that determines children's ability to read; much of this development is supported by the home learning environment (Sheridan et al, 2011). Parental involvement in children's literacy practices positively affects children's academic performance (Fan & Chen, 2001) and is a more powerful force for academic success than other family background variables, such as social class, family size, and level of parental education (Flouri & Buchanan, 2004). We examined relations between maternal home practices and children's skills in early literacy and mathematics. Children aged three and four (n=317), from three preschools associated with a university participated. Questionnaires were used to assess the level of learning activities at home. Children's mathematical abilities and literacy skills were evaluated with Test of Early Mathematics Ability (TEMA) and by an assessment of the number of letters and letter-sounds that children could name, respectively. A correlation indicated that home mathematical activities and TEMA scores were not significantly related ($r = 0.12$). There was a moderate, significant correlation ($r = 0.28$) between children's performance on the early literacy measure and home literacy activities. Results of this study indicate that the literacy activities that mothers complete at home with their children relate to children's skills in this area.

GENDER DIFFERENCES IN INTERPERSONAL SENSITIVITIES ACROSS ACQUAINTANCES, FRIENDS, AND ROMANTIC RELATIONSHIPS
Jaclynn Cosan
Category: Psychology, Section 1
Poster #: 322
Location: Ballroom, 9:30 AM - 11:30 AM
Mentor(s): Christopher Hopwood (Psychology Department)

Previous research has demonstrated gender differences in interpersonal behavior and problems in terms of the interpersonal circumplex (IPC) model of interpersonal behavior, which conceptualizes social functioning as varying along orthogonal agency and communion dimensions. However, no study has investigated gender differences on the interpersonal sensitivities circumplex (ISC), a measure that conceptualizes aversive behavior from an interpersonal circumplex perspective. Gender differences in interpersonal sensitivities have been examined using other measures than the ISC, yet all have examined sensitivities in the context of romantic relationships. In this study, I intend to investigate gender differences with respect to the

ISC across multiple relational contexts: acquaintances, friends, and love relationships in an archival sample of 315 undergraduates. Based on interpersonal theory and existing empirical evidence, I hypothesize that women would be more sensitive to coldness in love and friend relationships, men would be more sensitive to overly-nurturant behavior in love and friend relationships, and no differences would be found in sensitivity towards acquaintances. I further predicted that women would display higher levels of interpersonal sensitivity in general. Finally, I will also explore the impact of the gender of the person performing the potentially aversive behavior on ratings of interpersonal sensitivities.

THE BROADER AUTISM PHENOTYPE AND FRIENDSHIP QUALITY IN A COLLEGE STUDENT POPULATION
Nicole Block
Category: Psychology, Section 1
Poster #: 323
Location: Ballroom, 9:30 AM - 11:30 AM
Mentor(s): Brooke Ingersoll (Psychology)

Previous research has supported a set of subclinical traits qualitatively similar to Autism Spectrum Disorders. Referred to in the literature as the Broader Autism Phenotype, research suggests that these traits can not only be found in family members of individuals diagnosed with ASDs, but also in the general population. 155 undergraduate friend pairs completed questionnaires in the present study, including self and other reports of the BAP (Broader Autism Phenotype Questionnaire). Other measures were used to evaluate factors of friendship quality, values, and behaviors, and also personality characteristics. It was hypothesized that self-reported BAP would be related to one's own report of friendship quality (negatively) and negative relationship interactions (positively) and would be related to one's friend's report of friendship quality (negatively) and negative relationship interactions (positively). Results showed that reports of the BAP were negatively associated with the degree to which individuals indicate that they enjoy close friendships and view relationships as an important aspect of their own self-concept. It was also associated with ratings of friendship quality (negatively) and negative relationship interactions (positively) with the target friend. This was true for both self-reported and other-reported BAP. After controlling for the Big 5 personality traits, self-reported BAP remained an independent predictor of enjoyment of close relationships, friendship quality, and negative interactions; informant-reported BAP remained an independent predictor of friendship quality and negative interactions. These findings suggest that the presence of a greater number of autistic traits can negatively impact several aspects of friendship quality in a non-clinical sample.

GRADE POINT AVERAGE (GPA) PREDICTS EFFICIENT CONFLICT-MONITORING BRAIN-BEHAVIOR RELATIONSHIPS
Hans Schroder
Category: Psychology, Section 1
Poster #: 324
Location: Ballroom, 9:30 AM - 11:30 AM
Mentor(s): Jason Moser (Psychology)

The anterior cingulate cortex (ACC), a region in the medial frontal cortex of the brain, is thought to play a role in monitoring for conflicts and errors in performance tasks. Previous research suggests an association between ACC activity and academic performance (grade point average or GPA). The current study was designed to examine the functional specificity of this relationship. That is, we sought out to answer the question, do students with higher GPAs pay more attention to their mistakes, or do they monitor conflicts more efficiently? Event-related brain potentials (ERPs) -electric brain signals elicited after internal and external events - offer unique insights into the functional relationships between brain activity and performance. The error-related negativity (ERN) and N2 (difference wave) are both thought to reflect conflict processing, whereas the error positivity (Pe) is more indicative of error awareness. We examined these ERPs while 47 undergraduates completed a reaction-time task. Results indicated that the ERN was enhanced, the N2 was reduced, and the Pe was not different in the higher GPA students. Additionally, the ERN predicted faster conflict resolution reaction time, but only in students with high GPAs. In the lower GPA group, the N2 was associated with poorer conflict-resolution accuracy, but in the higher GPA group, the N2 was associated with more accurate conflict resolution. These results strongly suggest that GPA is not associated with enhanced or more effective error processing, but rather that it is associated with more efficient conflict monitoring.

CHANGE IS IN THE ERROR: MINDSET INDUCTION EFFECTS ON ERROR-RELATED BRAIN ACTIVITY AND BEHAVIOR
Hans Schroder
Category: Psychology, Section 1
Poster #: 325
Location: Ballroom, 9:30 AM - 11:30 AM
Mentor(s): Brent Donnellan (Psychology), Jason Moser (Psychology)

Growth-minded individuals believe that intelligence is a malleable ability that is a function of effortful learning. In contrast, fixed-minded individuals believe that intelligence is a stable trait resistant to change. These "mindsets" perceive mistakes differently: whereas growth-minded individuals view mistakes as opportunities to learn, fixed-minded individuals view mistakes as evidence of lack of ability. Our previous research used event-related brain potentials (ERPs) -electric brain signals elicited after internal or external events - to show that growth-minded individuals allocate more attentional resources to their errors, which predicts their tendency to bounce back after their mistakes. The current study was designed to extend that study by recording ERPs after temporarily manipulating participants' mindsets. Undergraduates read an article describing intelligence as being largely determined by challenging environments (Growth condition) or as a stable, immutable trait (Fixed condition) and then completed a reaction-time task. Results revealed that the mindset induction procedure was successful in manipulating participants' mindset endorsement. The manipulation also influenced performance and brain activity: regardless of their previous mindset, participants in the Growth condition demonstrated superior post-error accuracy compared to those in the Fixed condition, replicating our previous study. In contrast, overall ERP amplitudes did not differ between the conditions. However, only in the Growth condition did the amplitude of the error positivity (Pe), an ERP associated with attention allocation to errors, predict adaptive post-error adjustments. These findings suggest that error-related brain-behavior relationships can be optimized by implicit induction of a growth mindset.

GESTURE CREATES LEARNING THAT IMPROVES OVER TIME
Ryan Duffy
Category: Psychology, Section 1
Poster #: 326
Location: Ballroom, 9:30 AM - 11:30 AM
Mentor(s): Kimberly Fenn (Psychology)

Children who see gesture while learning mathematics learn more than children who do not see gesture and are more likely to maintain their learning three weeks later. We trained students on mathematical equivalence in their natural classroom setting. Children watched videos of an instructor who either gestured or did not gesture and were tested immediately and twenty-four hours later. There was a significant main effect of gesture; the gesture group performed better than the no-gesture group. Importantly, there was also a condition by time interaction; the gesture group improved after twenty-four hours whereas the no-gesture group did not. These findings suggest that gesture enhances the learning of abstract concepts on a classroom-wide level and directly affects how learning is maintained, an effect that can be observed after only one day.

MY, WHAT BIG CLAWS YOU HAVE!: CHILDREN'S PERCEPTION OF RELEVANT INFORMATION IN 3-D MUSEUM EXHIBITS
Ryan Duffy, Zack Keith
Category: Psychology, Section 1
Poster #: 327
Location: Ballroom, 9:30 AM - 11:30 AM
Mentor(s): Judith Danovitch (Psychology)

When faced with an unfamiliar, two-dimensional stimulus, children as young as 3 are able to make inquiries that allow them to develop new conceptual knowledge (e.g. Greif et al., 2006). Moreover, children tend to share conceptually relevant information with others, and this ability improves with age (Danovitch, under review). However, these findings have limited implications; they are drawn from data gathered in artificial laboratory settings that may not adequately represent realistic learning environments. To determine the information that children deem relevant in a more natural setting with 3-D stimuli, we are interviewing child visitors at the MSU Museum. After touring the animal diversity and habitat exhibits, children ages 4-10 are asked to identify the animals they saw and to share which aspects of those animals they found most interesting. Children are then asked to express what they would like to know about each animal and to decide what information they would share with a hypothetical child who will be attending the museum in the future. We expect that children will focus considerably more on conceptually irrelevant features than they do in laboratory settings because the physical attributes of animals are much more prominent and stimulating in a 3-D display than in a 2-D image. The results of this experiment will not only help

illuminate children's information-seeking and sharing behaviors in real-world contexts, but also help museum educators to evaluate the efficacy of their exhibit designs.

THE TORTOISE OR THE HARE?: PRESCHOOLERS' UNDERSTANDING OF THE EFFECTS OF IMPULSIVITY
Amanda Hardwick, Caroline Bell
Category: Psychology, Section 2
Poster #: 330
Location: Ballroom, 9:30 AM - 11:30 AM
Mentor(s): Judith Danovitch (Psychology)

By age 6, children understand that the amount of time a person spends thinking about a problem determines the quality of his or her decision, regardless of children's own impulsivity. Our study investigates whether preschool children understand this relationship as well. We anticipate that, before age 5, children find it difficult to understand the relationship between impulsive or reflective behaviors and outcomes. We are also interested in whether their performance on executive functioning and Theory of Mind tasks is related to this understanding or lack thereof. In our study, preschool children were presented with 10 scenarios. In each scenario, one person acts impulsively and another acts reflectively (e.g., one person folds his paper airplane very quickly and another takes his time). The children were asked to predict which person in the scenario experienced a given outcome (e.g., whose airplane does not fly?). Participants also completed three executive functioning tasks as measures of impulsivity and three Theory of Mind tasks. Data analysis examines age differences in understanding other people's behavior and how this understanding relates to the child's own performance on executive functioning and Theory of Mind tasks. The results have implications for helping parents and teachers form behavioral expectations for young children at home and in the classroom.

THE IMPACT OF EDUCATION ON EYEWITNESS TESTIMONY
Amber Markey
Category: Psychology, Section 2
Poster #: 331
Location: Ballroom, 9:30 AM - 11:30 AM
Mentor(s): Erik Altmann (Psychology), Mark Becker (Psychology)

Criminal convictions are often based on the testimony of an eyewitness who, as recent DNA cases have shown, can be inaccurate. Popular press has reported numerous cases of people whose lives have been ruined due to mistaken eyewitness testimony. Does learning of these disastrous incidents change how people view eyewitness testimony, and does it influence their decision when asked to identify a suspect? This study investigated these two questions. Half of the participants were presented with information regarding the potential dangers of eyewitness testimony (education condition) and the other half received information concerning a neutral topic (no education). All participants watched a staged crime and, two days later, chose a perpetrator, or none, from a lineup in which the target was either present (target-present condition) or absent (target-absent condition). Education had relatively minor effects on people's perceptions of eyewitness testimony but did impact their lineup decisions. False alarm rates decreased significantly in the target-absent condition, with no increase in the hit rate for the target-present condition. These results indicate that education about the flaws of eyewitness testimony turn people into better eyewitnesses.

CONSOLIDATION OF ORIENTATION INFORMATION INTO HUMAN VISUAL SHORT-TERM MEMORY
James Miller
Category: Psychology, Section 2
Poster #: 332
Location: Ballroom, 9:30 AM - 11:30 AM
Mentor(s): Mark Becker (Psychology), Taosheng Liu (Psychology)

Conscious visual perception requires that a stimulus be encoded and maintained in visual short-term memory (VSTM)—a process commonly referred to as consolidation. We are interested in how many items the visual system can consolidate at a time. To address this question, we used a sequential-simultaneous paradigm, in which two items were presented either sequentially or simultaneously, after which subjects' memory was tested. In our previous study, we found equivalent performance in sequential and simultaneous presentations for two colors, demonstrating that two colors could be simultaneously consolidated into VSTM. In the present study, we extend the sequential-simultaneous paradigm to study the

consolidation of orientation information into VSTM. Participants were asked to memorize the orientations of two gratings. The gratings were briefly presented either simultaneously, or sequentially, followed by a random noise mask. In three experiments, we consistently observed poorer performance in the simultaneous condition than the sequential condition. These results indicate that consolidation of orientation information into VSTM is under severe capacity limit, possibly one item at a time. This, along with the results of previous studies, suggests that the ability to simultaneously consolidate information into VSTM is extremely limited, but the severity of these limitations is contingent upon the nature of the visual feature that is being consolidated.

THE ROLE OF THE SUPPLEMENTARY MOTOR AREA IN BEAT PERCEPTION: A TRANSCRANIAL MAGNETIC STIMULATION (TMS) STUDY

Prashanth Rajarajan

Category: Psychology, Section 2
Poster #: 333
Location: Ballroom, 9:30 AM - 11:30 AM
Mentor(s): Devin McAuley (Psychology)

Previous research has suggested a connection between brain areas underlying movement, such as the supplementary motor area (SMA), basal ganglia, and cerebellum, and beat perception (Grahn & Brett, 2007). Some of these studies have observed the connection by using functional magnetic resonance imaging (fMRI) and found differential activation of the relevant brain areas during an ambiguous tempo paradigm. This behavioral paradigm has shown robust individual differences in beat perception even though identical stimuli are being presented, resulting in the categorization of participants as either strong or weak beat perceivers. Strong beat perceivers, who are better able to pick up on an implied beat, showed greater activation of the supplementary motor area (SMA) than weak beat perceivers, who rely solely on the explicit beat (Grahn & McAuley, 2009). The present study combines transcranial magnetic stimulation (TMS) with the ambiguous tempo paradigm to investigate the role of the SMA in beat perception. TMS will be used to stimulate the SMA while participants are performing the ambiguous tempo judgment task with the intention of temporarily interfering with the neural circuitry underlying internal beat generation and beat-based encoding. We hypothesize that the TMS stimulation will cause systematic change in behavior, such that strong beat perceivers will respond more like weak beat perceivers. This will be indicated by a significant decrease in a model-based measure of beat sensitivity.

EFFECT OF MOVEMENT ON THE METRICAL INTERPRETATION OF AMBIGUOUS RHYTHMS

Karli Nave, Prashanth Rajarajan

Category: Psychology, Section 2
Poster #: 334
Location: Ballroom, 9:30 AM - 11:30 AM
Mentor(s): Devin McAuley (Psychology)

People often synchronize their movements with the beat of the music they hear, often without being aware of their behavior. Phillips-Silver and Trainor (2005, 2007) showed that preference for a certain metrical pattern could be encoded in infants and adults by playing an ambiguous training rhythm and bouncing participants to one of two metric patterns (duple or triple). Participants, given two choices, chose the test rhythm with accents matching the metrical pattern to which they were bounced. With this evidence, they further posited that movement experience influences the subsequent encoding of the rhythm's metrical pattern, thereby changing how a beat is perceived. If this is true, then when participants are presented with an accented rhythm matching their movement experience along with the ambiguous training rhythm itself, they should still choose the accented rhythm. However, data from the current study suggest otherwise: they in fact chose what they explicitly heard during the training phase, the ambiguous rhythm. The current study uses the same experimental design as Phillips-Silver and Trainor, but with the training rhythm added as a test rhythm. When presented with the training rhythm and one of the two accented test rhythms, participants chose the training rhythm the majority of the time. These results do not support the auditory encoding hypothesis proposed by Phillips-Silver and Trainor (2005, 2007), thus opening a door for further experimentation.

FACTORS INFLUENCING THE BEAT-BASED ADVANTAGE IN RHYTHM DISCRIMINATION
Karli Nave, Ben Mastay, Jon Walters
Category: Psychology, Section 2
Poster #: 335
Location: Ballroom, 9:30 AM - 11:30 AM
Mentor(s): Devin McAuley (Psychology)

Previous research has produced evidence that rhythm discrimination is influenced by a beat-based advantage (BBA). Previous studies have shown that Parkinson's disease (PD) patients demonstrate a beat-perception based impairment when compared to control subjects on a rhythm discrimination task (Grahn & Brett, 2009). Last year at UURAF, we presented a study showing that the BBA found in healthy controls could be diminished by slowing the tempo of the rhythms being discriminated, thus mimicking the BBA deficit found in PD patients by Grahn and Brett (2009). The current study further investigates the role of tempo in the BBA. As in the previous study conducted by Grahn and Brett, participants in this study hear each rhythm twice, followed by a third rhythm, which they are asked to discriminate from the first rhythm. Rhythms are either presented at the original tempo used by Grahn and Brett (2009) or at a slower tempo. As hypothesized, slowing down the rhythms reduced discrimination performance. This reduction was greater for simple rhythms than complex rhythms, thus mimicking the BBA effects found in PD patients. In addition, the rhythms are also presented with either short (staccato) tones or long (legato) tones in order to examine the effects of tone length on beat perception. Results showed that the rhythms with short tones displayed a greater reduction in discrimination performance than the rhythms with long tones. This supports the conclusion that short tones are more discriminable than long tones, and thus demonstrate a stronger BBA.

INVESTIGATING DISCRIMINANT VALIDITY OF THE MONTREAL BATTERY OF EVALUATION OF AMUSIA
Patrick Engler, Bradley Seegert
Category: Psychology, Section 2
Poster #: 336
Location: Ballroom, 9:30 AM - 11:30 AM
Mentor(s): Devin McAuley (Psychology)

Congenital amusia ("tone-deafness") is a genetically-influenced, music-specific perceptual impairment characterized by the inability to distinguish and reproduce relative pitch changes (Ayotte, Peretz, & Hyde, 2002). The primary test for diagnosis is the Montreal Battery of Evaluation of Amusia (MBEA), a listening test with six subtests aimed at diagnosing specific impairment in music perception (Peretz, Champod, & Hyde, 2003). Previous research (Peretz & Hyde, 2003) showed high reliability and convergent validity (assessment measures the intended target) for the MBEA, but lacked emphasis on discriminant validity (assessment does not measure an unintended target). The MBEA is designed to specifically test music perception, which is claimed as a distinct cognitive ability (Peretz & Hyde, 2003; Peretz & Coltheart, 2003); therefore, individual differences in cognition, unrelated to music impairment, should not impact performance on the MBEA. However, the relationship between cognitive ability and MBEA performance has not been examined in depth. To analyze this relationship and test the discriminant validity of the MBEA, participants completed both the MBEA and a battery of eleven general cognitive ability (GCA) tasks examining fluid and crystallized reasoning, perceptual speed, working memory capacity, and executive attention. Performance on the GCA tasks was compared to performance on the MBEA, and results indicated moderate, positive correlations between total MBEA score and both fluid and crystallized reasoning measures. The positive correlations between these constructs are indicative of potential threats to discriminant validity. Individuals with lower cognitive ability may be inaccurately diagnosed with amusia, suggesting false positives are problematic for the MBEA.

TEST-RETEST RELIABILITY: THE CONSOLIDATION OF DECLARATIVE MEMORY
Kimberly Tweedale, Allison Conner
Category: Psychology, Section 2
Poster #: 337
Location: Ballroom, 9:30 AM - 11:30 AM
Mentor(s): Kimberly Fenn (Psychology)

Previous research has demonstrated that declarative memory is maintained better after a period of sleep than after an equal interval of wakefulness. Performance on a paired-associates memory task improves after sleep but not after waking, likely due to memory consolidation processes that occur during sleep. One potential concern with this research is its assumption that individuals have a stable and measurable ability to consolidate information across multiple testing points. However, no study to date has evaluated consolidation within an individual at multiple time points. Therefore, the reliability of consolidation has

yet to be established. To investigate the reliability of sleep-dependent consolidation, we examined the test-retest reliability of consolidation, looking specifically at paired-associates memory. Participants completed two consolidation assessments that were administered one week apart. During each assessment, participants were trained and tested on a list of semantically-related word pairs and sent home for a 12 hour retention interval that included sleep. When they returned in the morning, their memory was evaluated with a delayed cued-recall test. We analyzed performance for each item using three categories: maintained (recalled on both tests), gained (recalled only on the second test), and lost (recalled only on the first test). We found a significant correlation between the two consolidation periods for each category. Additionally, we found that performance on one standardized tests of intelligence (ACT score) is negatively correlated with memory loss over time. These findings indicate that consolidation ability is reliable and may be important to academic success.

THE EFFECT OF PROSODY CONGRUENCE ON NOVEL WORD LEARNING
Nathan Anderson, Katie Owen
Category: Psychology, Section 3
Poster #: 340
Location: Ballroom, 1:30 PM - 3:30 PM
Mentor(s): Kimberly Fenn (Psychology)

Previous research has demonstrated that changes in pitch, rate, and volume of speech can affect understanding of sentence word meaning. For example, emphasizing certain words can clarify an ambiguous spoken sentence. Furthermore, words have been shown to possess an inherently "appropriate" prosody based on their definition, such as high pitch for the word "small" and low pitch for "big." Congruency between word definition and prosody has been shown to speed comprehension of words. In the current study, we investigated the effect of prosody congruence on word learning. Participants were taught the definitions of nonsense words by providing images which represented the definition of each adjective. Each spoken word was presented with prosody that was either congruent or incongruent with its definition. Immediately after training, participants were tested on their memory for the words. Results suggest that participants were successful in learning the word definitions, but there was not a significant effect of congruency on learning; participants were equally likely to remember words presented with congruent and incongruent prosody. Research on related learning paradigms has shown that the effects of some manipulations are not observed until after a delay. Thus, we are collecting data on a second experiment wherein testing is administered 24 hours after training. A positive effect of prosody congruence on word learning would demonstrate that the specific prosody of a spoken word can influence word memory, a finding that may be important for practical language-learning applications.

SLEEP-DEPENDENT MEMORY CONSOLIDATION: A NEGLECTED DIMENSION OF GENERAL INTELLIGENCE?
Anthony Lai, Hannah Borland, Samantha Poland, David Smith
Category: Psychology, Section 3
Poster #: 341
Location: Ballroom, 1:30 PM - 3:30 PM
Mentor(s): Kimberly Fenn (Psychology)

It is well-established that sleep aids in the consolidation of declarative memory. Several studies have shown that recall of paired associates is higher after sleep but not after an equal waking interval, but few studies have investigated individual differences in sleep-dependent consolidation. The present study was designed to investigate the relationship between individual differences in cognitive ability and declarative memory consolidation during sleep. We adopted a novel analytical approach to explore the precise effect of sleep on memory. Participants were trained and tested on paired-associates and given a second test after 12-hours that included either waking or sleeping. We analyzed the number of items maintained, gained, or lost across time. Participants also completed a cognitive battery that assessed working memory capacity, fluid intelligence, crystallized intelligence, and verbal fluency. These data were used to estimate psychometric g or general intelligence. Results suggest that the sleep group showed more items maintained and gained and fewer items lost than the wake group. Furthermore, psychometric g was positively correlated with the amount of items maintained and gained and negatively correlated with the number of items lost in the sleep group. There were no significant correlations between the factors in the wake group. Importantly, psychometric g was not related to baseline recall performance in Session 1, suggesting that the correlations were specific to change in performance after sleep. These findings suggest that variation in general intelligence may in part reflect differences in storage and consolidation of new memories during sleep.

GENDER IDENTITY MANAGEMENT: HOW IMPORTANT IS IT? PERSPECTIVES FROM FEMALE FACULTY MEMBERS
Mary Keegin
Category: Psychology, Section 3
Poster #: 342
Location: Ballroom, 1:30 PM - 3:30 PM
Mentor(s): Ann Marie Ryan (Psychology)

Identity management theory explains that individuals actively engage in behaviors that present different facets of their identity in ways that maximize social cohesion and positive perceptions from others. How important is the conscious management of gender identity for an individual? Research evaluating individual gender identity management behaviors suggests that men and women are perceived differently, but no research has been done to investigate how conscious gender identity management behaviors are. The current study used one-on-one interviews to gain insight into the unique perspectives of female faculty members. Using an inductive approach to analyze our interview data, we found that there are important factors that lead to conscious decisions to manage gender identity. Awareness of one's gender while teaching and interacting with students and colleagues led to engagement in strategic identity management choices. Furthermore, we identified a discrepancy between strategy choices and the attribution of reported choices to the management of gender identity. The conclusions drawn from this research suggest that it is important for women to reflect on the ways gender identity management choices have affected and continue to affect the way they are perceived within organizations.

PSYCHOLOGICAL DISORDERS IN THE WORKPLACE: STEREOTYPES AND IDENTITY MANAGEMENT STRATEGIES
Adam Roebuck
Category: Psychology, Section 3
Poster #: 343
Location: Ballroom, 1:30 PM - 3:30 PM
Mentor(s): Ann Marie Ryan (Organizational Psychology)

Current research on individuals with invisible stigmatized identities (i.e., identities that are not readily observed) point to the use of a cost-benefit analysis when making decisions about how to manage identities. Individuals attempt to present themselves in a way that will not lead to undesired outcomes such as discrimination, lower job satisfaction, lower self-esteem, or social isolation. Actions taken may either associate (e.g., acknowledging that the individual belongs to an identity group) or distance (e.g., avoid discussions about the identity) the individual with the identity. Research shows that these decisions create quandaries for those managing their identities. As of now, there is very limited research on those who possess a psychological disorder in the workplace. This two-part study aims first at tapping into the perceptions of others of individuals with psychological disorders (e.g., obsessive compulsive disorder, attention deficit hyperactive disorder, bipolar disorder, and schizophrenia). Study two focuses on how individuals with psychological disorders manage their identities in the workplace. Implications from this research may benefit in the education of organizations on employees' well being.

DO MOST PEOPLE HOLD BABIES ON THEIR LEFT SIDE BECAUSE THEY PREFER TO LOOK AT EMOTIONALLY-AROUSING OBJECTS ON THEIR LEFT?
Nathaniel Stewart
Category: Psychology, Section 3
Poster #: 344
Location: Ballroom, 1:30 PM - 3:30 PM
Mentor(s): Lauren Harris (Psychology)

When adults, whether left- or right-handed, hold infants, 60-85% hold to their left but show no such bias for holding other objects, like vases. The bias even occurs when the infant is merely imagined, or when a doll is held instead. We hypothesize that the bias reflects direction of attention for perceiving facial emotions. From evidence that this perception is associated with higher arousal in right-hemisphere regions specialized for face and emotion perception, and that attention is to the side opposite the more aroused hemisphere, attention should be to the left, consistent with the left-hold bias. To find out, we assessed the attentional act independent of the act of holding. We asked 482 adults to imagine a baby and to report whether they 'saw' it in any particular location and then to pick up and hold an infant doll "the way you would normally." We included a vase-hold task and a handedness questionnaire. We have just begun data analysis but results are promising in showing similar percentages (approx. 60%) of subjects imagining the baby to their left and holding the doll on their left vs. only 43% for the vase. Further analyses will compare men and women and take handedness and other measures into account.

BINGE EATING PHENOTYPE AND BRAIN ACTIVATION IN RESPONSE TO PALATABLE FOOD EXPOSURE IN ADULT FEMALE RATS
Dana Gradl
Category: Psychology, Section 3
Poster #: 345
Location: Ballroom, 1:30 PM - 3:30 PM
Mentor(s): Cheryl Sisk (Neuroscience)

Disordered eating, including binge eating behaviors, disproportionately affects girls and women compared to boys and men. Although most research has focused on psychosocial factors contributing to this sex difference, there may also be biological influences. Our lab has shown that binge eating behaviors in a population of female rats naturally emerge during puberty. The occurrence of this human-like behavior in rats strongly suggests that biological factors are contributing to it. The current study aims to explore this behavior further by examining whether a difference in brain activation exists between binge eating prone (BEP) and binge eating resistant (BER) rats. Adult female Sprague-Dawley rats (n=40) were exposed to palatable food (PF) for four hours every Monday, Wednesday, and Friday for three weeks. They were classified as BEP, BER, or binge eating neutral using a previously established model examining 4-hour PF intake. One week after the feeding tests, animals were exposed to PF for one hour and sacrificed half an hour later. Fos immunohistochemical staining was used to compare brain activity across animals. The results of this study are still being analyzed. It is expected that the BEP rats will show increased activation of the nucleus accumbens. This area is associated with reward sensation, which PF has been shown to provide. BER rats may show increased activation of the prefrontal cortex. Linked with inhibition control, greater activation could potentially cause the lack of binge eating behavior seen in this group.

A DIURNAL RODENT MODEL FOR SAD
Greg Leach
Category: Psychology, Section 3
Poster #: 346
Location: Ballroom, 1:30 PM - 3:30 PM
Mentor(s): Lily Yan (Neuroscience)

Seasonal Affective Disorder (SAD) is a common mood disorder affecting millions of Americans, who suffer from recurring depressive symptoms in winter when there is less sunlight. The leading theory explaining SAD is the phase-shifting hypothesis, which states that depressive episodes are caused by misalignments between circadian rhythms and habitual sleep time. However, there is a fundamental gap in understanding how changes in environmental lighting conditions lead to fluctuations in affective state in SAD patients. The objective of this study is to develop the diurnal grass rats (Arvicanthis niloticus) as an animal model for SAD and to explore the neural mechanisms underlying the light-associated mood changes. With use of artificial lights, the duration of daily light exposure for humans does not change as significantly as light intensity over the seasons. Therefore, changes in light intensity could play a major role in mood fluctuations. In the present study, we utilized a Dim Light:Dark (DimLD) paradigm by decreasing light intensity during the day. Anxiety and depression-like behaviors were assessed using the following tests: Open Field, Light-Dark Box, Novelty Suppressed Feeding, Sweet Solution Preference and Forced Swimming. The results suggest that, compared to control animals in LD conditions, those in DimLD had higher levels of anxiety and depression–like responses. Brain regions involved in mediating the photic effect and in regulating mood are being examined to elucidate the related neural substrates. An adequate animal research model will contribute a tool to investigate the associated neurological responses and mechanisms underlying mood changes induced by light.

EPISODIC MEMORY IN MUSIC: INVESTIGATING INDIVIDUALS' ABILITY TO FORM MEMORIES FOR TIMBRE
Patrycja Zdziarska, Neelima Wagley
Category: Psychology, Section 3
Poster #: 347
Location: Ballroom, 1:30 PM - 3:30 PM
Mentor(s): Devin McAuley (Psychology), Tuuli Morrill (Psychology)

For musical excerpts, episodic memory is dependent on one's recollection of when, where, and how that excerpt was last encountered. To further understand the role of episodic memory in music, the present study investigated individuals' ability to form memories for timbre, or instrument sound, in which a novel melody was last heard. Two experiments were employed where the amount of exposure to melodies was varied. In experiment 1, participants heard melodies once, whereas in experiment 2, they heard six consecutive presentations. In both experiments, participants performed the same memory task in

which they were asked to remember the timbre that was paired with each of the 16 novel melodies that were randomly presented in either piano or flute timbres. After a brief distraction task, participants were tested on their ability to recognize whether the timbre of each melody was the "same" or "different" from what they heard at the start of the experiment. Analysis using a single sample t-test showed that participants were able to recognize the timbre of melodies at accuracies of above chance only after being presented with each of the melodies six consecutive times. Overall, participants' performance on the recognition task tended to be low across the two experiments. In sight of prior research, these findings suggest that during recognition of musical timbre, participants might be relying on a "feeling of familiarity" brought on by longer exposure to stimuli rather than on specific episodic memories for timbre.

DEPRESSED IN YOUR OWN WAY: INTERPERSONAL VARIABILITY AMONG DEPRESSED UNDERGRADUATES
Sindes Dawood
Category: Psychology, Section 4
Poster #: 350
Location: Ballroom, 1:30 PM - 3:30 PM
Mentor(s): Christopher Hopwood (Psychology)

People with depression can present with different interpersonal styles, and this raises the possibility of designing more individualized treatments for depression that target these various styles. This study extended previous theory and research on interpersonal variability in depression by identifying groups that differ in the type and degree of interpersonal problems among young adults with increased risk for depression. Eight-hundred and eight undergraduates completed self-report questionnaires assessing depression, interpersonal problems, and personality traits. Interpersonal problems data from participants whose depression score ranged from moderate to severe (N= 172) were subjected to latent profile analysis, which classified individuals with depression into distinct groups defined by the types of interpersonal problems they experience. The analysis yielded five distinct interpersonal subgroups of depressed individuals which were labeled: dominant, warm, submissive, cold, and undifferentiated. These distinct subgroups did not differ in depressive severity, but did significantly differ from one another in regards to maladaptive personality traits as well as total severity of interpersonal problems. For example, results indicate that warm individuals tended to have the highest levels of Separation Insecurity, whereas cold and dominant people tended to have the highest levels of Manipulativeness and Withdrawal. These findings suggest the potential importance of considering interpersonal variability in clinical practice and research with depressed individuals and highlight the importance of ongoing research on heterogeneity in depression, particularly when it focuses on interpersonal functioning.

DOES GRAPHEME-COLOR SYNESTHESIA AFFECT ALGEBRAIC REASONING?
Krista Bur
Category: Psychology, Section 4
Poster #: 351
Location: Ballroom, 1:30 PM - 3:30 PM
Mentor(s): Devin McAuley (Psychology)

Synesthesia is a perceptual phenomenon in which stimulation in one sensory modality simultaneously elicits a perceptual experience in a different modality. Our previously presented studies explored the reliability and automaticity of grapheme-color synesthesia. The results were congruent with other studies and indicated that grapheme-color synesthesia is both reliable and automatic, although the level of automaticity varies per individual. The current study extends this work by examining automaticity of grapheme-color synesthetic experiences in mathematical reasoning. Previous research provided evidence that principles of perceptual grouping can interfere with the application of order of operations rules in algebraic equations. In Experiment 1, we presented non-synesthetes with equations in which the color of variables was either consistent or inconsistent with the grouping expected by correct application of order of operations rules. Font colors matched those chosen by synesthetes in a color-matching task. In Experiment 2, we presented synesthetes and non-synesthete controls with black and white equations in which the synesthetes' perceived colors were either consistent or inconsistent with the order of operations. Variables with similar perceived colors were predicted to induce perceptual grouping and thus potentially interfere with application of the correct order of operations. Results indicate that non-synesthetes did not demonstrate perceptual grouping effects with synesthetes' chosen colors. For further exploration, we presented non-synesthetes with equations in which font color grouping pairs were identical colors, not matched to the synesthetes' chosen colors. Results also indicate that at least with unlimited presentation time, synesthetes avoid making order of operations errors induced by perceptual grouping.

MATERNAL DEPRESSION AS IT RELATES TO CHILD LANGUAGE DEVELOPMENT AND SELF-REGULATION
Elizabeth Cauley, Sarah Perry, Trisha Tower
Category: Psychology, Section 4
Poster #: 352
Location: Ballroom, 1:30 PM - 3:30 PM
Mentor(s): Lori Skibbe (Human Development and Family Studies)

We investigate relations between maternal depression and children's outcomes, including self-regulation and language. Self-regulation is important when coping with environmental changes and modifying behavior (Suda, 1988). To replicate previous work (e.g., Stein, 2008; Wu, 2011), we also investigate associations between maternal depression and children's language development, as measured by vocabulary and phonological awareness. Our sample includes 225 preschool aged children (110 female, 115 male) and their mothers. We measured child phonological awareness (Mean = 12.42, SD = 7.07) and vocabulary (Mean = 46.76, SD= 14.95) using the Test of Preschool Early Literacy (TOPEL). The Head-Toes-Knees-Shoulders Task was administered to measure child behavioral self-regulation. In this task, children are asked to do the opposite of what the administrator says (e.g., when told to touch their toes, the children instead touch their heads) and are given a score from 0 to 40 (Mean = 8.55, SD = 11.81). Mothers completed the Patient Health Questionnaire, which measures maternal depression with possible scores ranging from 10 to 40 (Mean = 13.25, SD = 4.11). Results indicate that maternal depression is not significantly related to the outcomes studied, including phonological awareness ($r = -.017$, $p = .855$), vocabulary ($r = .031$, $p = .730$), and self-regulation ($r = .086$, $p = .265$). Although maternal depression was not related to child outcomes, as we initially hypothesized, we noted that maternal depression was low in this sample, possibly reducing our ability to detect significant results.

USING FUNCTIONAL MAGNETIC RESONANCE IMAGING TO READ THE HUMAN BRAIN
Ellen Regorrah, Emily Cox, Haley Gleeson, Vahini Koka
Category: Psychology, Section 4
Poster #: 353
Location: Ballroom, 1:30 PM - 3:30 PM
Mentor(s): Jie Huang (Radiology)

The human brain is functionally organized, and different parts of the brain are involved in performing different cognitive tasks. For a specific task, there exists a specific brain activation map, and accordingly knowing the brain activation map provides a measure to detect the task. We used fMRI neuroimaging technique to acquire brain activation images of six subjects while they performed three different tasks. The three tasks consisted of viewing pictures, reading stories, and solving math problems. Each task consisted of sixteen trials, with a total of forty-eight trials for all of the tasks. Images were sorted for each task and then analyzed to produce the corresponding brain activation map for the task. For the purpose of brain reading, those activation maps will be used to detect which trials correspond to which task.

THE EFFECT OF SLEEP DEPRIVATION ON MEMORY SUSCEPTIBILITY TO MISLEADING INFORMATION
Holly Lewis, Elyse Horak, Rudra Joshi, Christopher Magas
Category: Psychology, Section 4
Poster #: 354
Location: Ballroom, 1:30 PM - 3:30 PM
Mentor(s): Kimberly Fenn (Psychology)

After initial encoding, misleading information may severely alter memory, creating a false memory. Several studies have explored conditions under which memory is susceptible to misleading information, but the role of sleep deprivation has not been investigated. Sleep deprivation has severe consequences on cognitive function, reducing working memory capacity and the ability to acquire information. Furthermore, sleep deprivation has been found to increase false recognition in an illusory memory paradigm. In two experiments, we investigated the effect of sleep deprivation on memory reconstruction. Participants completed three experimental phases: encoding, misinformation, and testing. During encoding, participants were shown a set of pictures that depicted a story. During misinformation, they read sentences describing the story. The sentences included false information about some of the story's events. Finally, participants were given a multiple choice test on their memory for the pictures. When all phases were completed after either sleep or sleep deprivation, sleep-deprived participants showed lower rates of correct memory and higher rates of false memory than participants who had slept. If encoding occurred in the evening and misinformation was given after sleep or deprivation, the effect of deprivation was reversed. Sleep deprivation reduced false memory, suggesting that deprivation may increase susceptibility to false information when memory is encoded in a state of deprivation but decrease susceptibility if memory is encoded in a fully-rested stated and misinformation is encoded after

deprivation. These results have implications for eyewitness testimony and test performance of sleep-deprived students who are presented with trick questions.

THE EFFECTS OF GENDER COMPOSITION ON THE ROLE OF MENTORING IN ATHLETIC COACHING
Phillip Pratt, Kristen Kelsay, Christina Miller, Sarah Parks
Category: Psychology, Section 4
Poster #: 355
Location: Ballroom, 1:30 PM - 3:30 PM
Mentor(s): Deborah Feltz (Department of Kinesiology)

Scholars suggest that gender composition of mentoring relationship needs to be considered when studying its effect. However, past research on this topic have offered mixed results (Wanberg et al., 2003). The purpose of this study was to examine the relationships between mentoring relationship quality and leadership skills competency and mentees' (assistant athletics coaches) perceptions of gender discrimination and work-family and family-work conflicts in the field of collegiate coaching. We also examined the possible differences in the relationships among different mentors' (head coaches) and mentees' (assistant coaches) gender compositions. Path analysis on 245 pairs showed that mentoring relationship quality was positively related to leadership skills competency and negatively related to perceptions of gender discrimination at workplace. The relationships between mentoring relationship quality and work-family and family-work conflict were negative although they did not reach the significant level ($p = .06$, $p = .10$, respectively). We also conducted multiple group analyses among four groups: male assistants and male head coaches (mAC-mHC), male assistants and female head coaches (mAC-fHC), female assistants and female head coaches (fAC-fHC), and female assistants and male head coaches (fAC-mHC). We found the structural invariance for all the paths except between mentoring relationship quality and leadership skills competency. We found differences in this particular path between (a) mAC-mHC and mAC-fHC and (b) mAC-mHC and fAC-fHC. The association between mentoring relationship quality and leadership skills competency was negative for mAC-mHC, however, this relationship was positive for mAC-fHC and fAC-fHC. Implications for future research and practice are discussed.

EXAMINING EMPATHY AND CLOSENESS IN CROSSOVER OF BURNOUT AND ENGAGEMENT BETWEEN ROOMMATE DYADS
Allison Nisbett
Category: Psychology, Section 4
Poster #: 356
Location: Ballroom, 1:30 PM - 3:30 PM
Mentor(s): Daisy Chang (Psychology)

The purpose of this study is to examine the mechanism underlying crossover of burnout and engagement using the demands-resources model as a research framework with a sample of university roommate pairs. Studying crossover is pertinent to work-family balance and has been examined in married couples with the assumption that their intimate relationship makes crossover possible. Recently, crossover has also been implicated among work team members, whose relationships do not embody the intimacy that marriage does. In this study, I contribute to the understanding of crossover effects by incorporating a new population into crossover research: roommate dyads. To understand whether the nature or intensity of a relationship matters to crossover, I incorporate a measure of relationship quality to test for its moderating effect on crossover. Trait empathy is also measured to test for moderating effects. I will first discuss proposed mechanisms for crossover and will elaborate on the role of empathy in crossover. Next, I will examine the constructs engagement and burnout, and I will explain how the demands-resources model accounts for the antecedents of both. Lastly, I will discuss the nature of the dyad's relationship in which crossover occurs, including a comparison and contrasting of roommate dyads to spouses and to coworkers in the context of crossover. Methods of the study will also be presented.

MICHIGAN STATE UNIVERSITY STUDENTS' KNOWLEDGE OF EMPLOYEE DIVERSITY RIGHTS
Jooi Dave
Category: Psychology, Section 4
Poster #: 357
Location: Ballroom, 1:30 PM - 3:30 PM
Mentor(s): Christine Kermond (Psychology)

Not many graduating seniors are aware of the type of information that can be legal used to hire, fire, or promote an employee. We assessed current Michigan State University students' knowledge of employee diversity rights. Employment discrimination is

prohibited when it is based on race, religion, sex, national origin, and color (Civil Rights Act of 1964), disability (Americans with Disabilities Act, 1990), and age (Age Discrimination Act, 1976). The questionnaire consisted of a set of diversity rights testing domains and scenarios that may arise in an office setting. Respondents indicated their belief of whether in a majority of instances, employers can make employment decisions (e.g., hiring, firing, promoting) based on certain information about them (e.g., gender, age, disability). The results show that students varied most on their responses in the age domain. Only 37% of students correctly responded that it is illegal to discriminate based on age. On the other hand, most students correctly identified religion as a protected category of employment decisions, except for those questions pertaining to religious accommodation and bone fide occupational requirements. In the future studies, it will be fruitful to study job search behaviors or identity management strategies based on an applicant's knowledge of their employment rights.

Social Science: General

Oral Presentations

REAGAN AND CLINTON: DIFFERENT LEADERSHIP FOR DIFFERENT DECADES
Robert Sanders
Category: Social Science: General, Section 1
Location: Lake Superior Room, 9:00 AM
Mentor(s): David Winder (James Madison College)

President Ronald Reagan and President Bill Clinton had different doctrines and foreign policies for different worlds. During Reagan's presidency, his doctrine and foreign policies consisted of rebuilding and rearming the United States military, covert operations, and strong challenge against the Soviet Union and the communist's forces around the world. The Reagan Doctrine was consistent with a realist perspective and supported by a unified cabinet that included George P. Shultz, Jeane Kirkpatrick, and many other key cabinet members. Meanwhile, President Clinton created new a doctrine and foreign policies based on "engagement and enlargement". Clinton's engagement and enlargement doctrine emphasized intervention for democratic and humanitarian values and globalization. The Clinton Doctrine was created with the advice of key advisors, including Anthony Lake, Madeleine Albright, and Warren Christopher, and it is consistent with an outlook of neoliberalism. In comparison, Ronald Reagan had to worry about the Cold War, while Bill Clinton had to deal with the United States' newfound dominance in the world. Ronald Reagan's invasion of Grenada and Bill Clinton's intervention in the Bosnia War represent leadership actions taken based upon their respective doctrine and foreign policies that existed in two very different worlds.

SEX TRAFFICKING AND IMMIGRATION
Bashar Dimitry
Category: Social Science: General, Section 1
Location: Lake Superior Room, 9:15 AM
Mentor(s): Anna Pegla-Gordon (James Madison College)

Sex trafficking is synonymous with heinous crimes against humanity where as immigration is not. However, immigration policy in the United States is helping and has helped contribute to sex trafficking in many ways. I will explore the intersection of U.S. immigration policy and sex trafficking. I will explore what impact immigration policy has had on sex trafficking and vice versa and in the process try to conjure up some solutions. Trafficking in persons is often aided by official corruption in countries of origin and corruption in transit and destination, thereby threatening the rule of law (H.R.3244). It is also often the case that the U.S. is a top priority destination for victims due to the great buying power and high demand in our country. It is no wonder then, that the U.S. Government, having no jurisdiction over other nation's governments, should feel compelled to pass laws that better protect the victims, and that these laws have a direct impact on and are tied up to immigration laws. My essay details what can best be done for immigrant victims in particular, but my research will show overlap in solutions for the entire sex trafficking industry in ways to help all victims. Ultimately, I find that the best preventative measure against sex trafficking is to educate the buyers or "johns". This essay is about the preventative measures and the responsibility that the U.S. must take if we truly do want to lead the way in the fight against sex trafficking.

POST TRAUMATIC SLAVE SYNDROME AND NOTIONS OF AFRICAN AMERICAN BEAUTY IN CONTEMPORARY SOCIETY
Patricia Jackson
Category: Social Science: General, Section 1
Location: Lake Superior Room, 9:30 AM
Mentor(s): Davic Walton (African American Studies), Shanti Zaid (African American Studies)

Some of Today's notions of black beauty are based on a model of white beauty. My research questions the utility of the concept of Post Traumatic Slave Syndrome (PTSS) for understanding this contemporary attitude of beauty toward African American women based on a Eurocentric model. This research is important because it questions how there may be a relationship between the experiences from slavery and contemporary models of beauty among African Americans. Post Traumatic Slave Syndrome is a concept coined by Joy Degruy Leary that is defined as a "condition that exists when a population has experiences multigenerational trauma" resulting from centuries of slavery and continual oppression. Leary's formula to describe the causes of Post Traumatic Slave Syndrome is **M** (Multigenerational Trauma from continued oppression) + **A** (Absence of opportunity to

access the benefits available in society leads) = **PTSS.** I test the validity of Joy Leary's Post Traumatic Slave Syndrome concept by applying it to the problematic Eurocentric definition of African American beauty identified from contemporary sources within media outlets and interviews. My findings show that Post Traumatic Slave Syndrome has explanatory power over today's distorted view of the concept of black female beauty.

INTERCULTURAL NONVERBAL COMMUNICATION IN THE WRITING CENTER: A CASE OF CHINESE STUDENTS
Rebecca Krul
Category: Social Science: General, Section 1
Location: Lake Superior Room, 9:45 AM
Mentor(s): Scott Chiu (Writing, Rhetoric, and American Culture)

Effective interpersonal communication through verbal and nonverbal cues is key to successful writing consultation. Americans are very familiar with American types of nonverbal communication, such as frequent hand gestures and strong eye contact, which makes for successful writing consultations. However, many nonverbal behaviors between two different cultures, for example, an American consultant and a Chinese client, can be misunderstood. Nonverbal gestures do not have the same meaning in all cultures and can create frustration for both consultant and client when ineffective communication is taking place during an ESL writing consultation. In my presentation, I will address the nonverbal behaviors of Chinese students that may positively or negatively affect writing center consultation if unnoticed, and the nonverbal behavior of American consultants that are misunderstood or misinterpreted. Through observation and interviews with Chinese students who come to the Writing Center at Michigan State University, we examine if cultural differences in nonverbal behavior contribute to less effective writing consultations. The writing consultants can avoid misunderstanding and take advantage of nonverbal cues that may result in successful communication and effective consultation. The findings will better our understanding of intercultural communication that often happens in the Writing Center and be beneficial to writing center work.

"DON'T PUSH ME CAUSE I'M CLOSE TO THE EDGE I'M TRYING NOT TO LOSE MY HEAD:" INEQUALITY IN POLITICAL, ECONOMIC AND SOCIAL ISSUES THROUGH HIP HOP
Alexandria McKinney
Category: Social Science: General, Section 1
Location: Lake Superior Room, 10:00 AM
Mentor(s): David Walton (African and African American Studies), Shanti Zaid (African and African American Studies)

Inequality in the United States is an important theme that many Hip Hop artists address in their art. To explore this theme, my paper focuses on political, economic, and social issues of inequality raised in Hip Hop music over several decades. I examine and historically contextualize five Hip Hop songs that engage or develop the issue of inequality. These artists include: Tupac's "Changes", Queen Latifah's "Ladies First", Lauryn Hill's "Mystery of Iniquity", Public Enemy's "Fight the Power", Grand Master Flash and the Furious Five's "The Message", Young Jeezy's "My Presidents is Black", Kanye West's "Jesus Walks" and Lil Wayne "Georgian Bush" . I choose to analyze these artists because their songs were released during the black aesthetics movement, black conscious period, and the early 90's. I argue that in raising political, economic, and social inequality issues, these Hip Hop artists are attempting to influence the thoughts of their audience and promote awareness and change within their community. For this project I am using a critical analysis approach to discuss hip hop from the racialized, feminist, and empowerment perspective that artist have incorporated into their music. My findings further illustrate how African Americans have used music to construct and convey a critique of persistent issues important to the African American community.

SAD, ANGRY, AFRAID, OH MY! CHILDREN'S UNDERSTANDING OF HOW EMOTIONS INFLUENCE COGNITION
Meghan Kanya
Category: Social Science: General, Section 1
Location: Lake Superior Room, 10:15 AM
Mentor(s): Judith Danovitch (Psychology)

Different emotional states affect cognitive abilities (e.g., anger influences a person to become more impulsive and irrational) and adults are aware of this influence (Pham, 2007). However, thus far children's understanding of this phenomenon has not been examined. This study examined whether children ages 4-10 understand that emotional states influence cognitive processes. In the first task, children heard two different types of stories involving characters experiencing different emotional states while they made various decisions. In the second task, children were asked to explain why a character made an irrational decision. In addition, preschool children also completed measures of theory of mind and executive functioning. Preliminary

results suggest that the ability to understand that different emotional states affect cognition develops with age. These results also suggest that older children are more likely to use emotions as causal explanations and can more easily generate complex explanations for irrational behaviors. This study will help researchers and practitioners understand at what age children develop emotional knowledge for events occurring around them and others' behavior.

"AIN'T THAT BEAUTIFUL?" GRAFFITI IN MONTREAL AND NEW ORLEANS
Brette Fischer
Category: Social Science: General, Section 1
Location: Lake Superior Room, 10:30 AM
Mentor(s): Toby Ten Eyck (Sociology)

Graffiti is viewed by many people as a scourge upon society, especially in large urban areas. Others view it as an aesthetic upgrading of drab inner city environments, as well as a voice of the oppressed masses. This study is being proposed to understand the ways in which people view graffiti and its role in urban areas. Using a conceptual framework derived from work on risk communication and reflexive modernity, I will study texts from US newspapers and internet images to analyze how graffiti is discussed in public forums. In addition, I will interview officials from New Orleans and Montreal about their views on graffiti. Through this two-pronged approach, I will develop a better understanding of the role of graffiti as an aesthetic reflexive reaction to modernity.

THE EFFECTS OF INTEGRATION ON URBAN SCHOOL DISTRICTS AS IT RELATES TO AFRICAN AMERICANS
Artina Tyus
Category: Social Science: General, Section 1
Location: Lake Superior Room, 10:45 AM
Mentor(s): David Walton (African and African American Studies), Shanti Zaid (African and African American Studies)

This paper explores the social consequence of racial integration on public schools in urban areas. Integration is commonly viewed as having a positive effect on urban school districts. However, it produced many negative consequences and today, there is a disparity between the quality of education provided in urban school districts compared to suburban school districts. Based on a review of literature chronicling the changes in urban school districts since the Supreme Court case Brown v. Board of Education, my research highlights some of the causes of disparity produced by integration. I find with the integration of urban public schools came the outward migration of whites, whose taxed income provided a valuable resource to these schools. As a result of "white flight," urban cities lost large amounts of tax revenue. This negatively affected the school districts within these localities, which disproportionately affected schools with African Americans as the majority. The lack of resources resulted in urban schools becoming less equal to suburban schools and their students being provided a subpar level of education.

THE PORNOGRAPHY OF VIVISECTION: A FEMINIST MEDITATION ON THE VIVISECTIONIST INDUSTRIAL COMPLEX
Mitch Goldsmith
Category: Social Science: General, Section 1
Location: Lake Superior Room, 11:00 AM
Mentor(s): Anthony Kolenic (Peace and Justice Studies)

This presentation seeks to explore the ways in which masculinist culture (and the pornographic mind) has amassed power, strength, force and cultural capital to objectify, commodify and in other ways exploit women, animals and the natural world, particularly in the overlapping contexts of pornography and animal experimentation. Using the works of Andrea Dworkin, Susan Griffin, Marilyn Frye, Carol Adams, Susanne Kappler and others, I will trace the rise of both complexes through the Enlightenment and into modern day. This presentation will better allow us to understand both pornography and animal experimentation (vivisection) as ritualized forms of violence and expressions of power which use rhetorical and aesthetic devices to compose oppressive and manipulative representations by simultaneously destroying and creating new conceptualizations of women and nonhuman animals.

WHAT DO I COME HOME TO: REINTEGATION CHALLENGES OF AFRICAN AMERICAN WOMEN POST INCARCERATION
Lar'Quette Smith
Category: Social Science: General, Section 2
Location: Lake Superior Room, 1:00 PM
Mentor(s): David Walton (African American and African Studies), Shanti Zaid (African American and African Studies)

The current study reviews existing literature concerning the distinct challenges African American women face when attempting to reintegrate back into the community after prison release. Using data obtained from previous scholarly works that focused on African American women and the obstacles they encounter post incarceration, the present study uses a critical theoretical framework to analyze how and why African American women face difficulties when trying to secure housing, employment, and reunification with their children. In addition, the study interrogates the role of larger social and structural forces in these problematics. I ultimately argue that African American women, upon reintegration face difficulties finding housing due to landlord resistance to renting to women with a history of imprisonment. They also face challenges in securing employment because of low levels of education and little history of legal working experience. In addition, African American women are usually the sole caretakers of their children thus; they often have to navigate the foster care system and courts when attempting to reassume their parenting roles.

IMPLEMENTATION OF FIXED-B THEORY IN STATA: A MONTE CARLO SIMULATION STUDY
Yipeng Zhao
Category: Social Science: General, Section 2
Location: Lake Superior Room, 1:15 PM
Mentor(s): Tim Vogelsang (Economics)

In this paper we examine the finite sample performance of fixed-b critical values as calculated by the new STATA commands, neweyfixedb and xtsccfixedb. These STATA commands calculate fixed-b critical values for test statistics based on Newey-West standard errors (time series regression models) and Driscoll-Kraay standard errors (panels with substantial time series data). By running Monte Carlo simulations, we compare the finite sample properties of the fixed-b critical values with the traditional N(0,1) critical value for different test statistics. The impact of the strength of the serial correlation and the bandwidth choice are also examined in the simulation study. In addition, we extend existing STATA commands to calculate the Andrews (1991) data dependent bandwidth for both panel data and time series regression. Performance of the fixed-b critical values used in conjunction with the Andrews data dependent bandwidth rule is also explored.

REACTIONS TO OSTRACISM: EVIDENCE FOR A STRONG SITUATION?
Sarah Effner, Conrad Corretti, Abraham Kim, Andy Wiese
Category: Social Science: General, Section 2
Location: Lake Superior Room, 1:30 PM
Mentor(s): Brent Donnellan (Psychology)

The hypothesis that the experience of ostracism is psychologically painful has received abundant support in the literature (Gerber & Wheeler, 2009). Ostracized individuals report temporary feelings of reduced self-esteem, control, belonging, and meaningful existence. These immediate reactions to exclusion have been argued to be a reflexive response that is insensitive to personality factors (Williams, 2007). The present research examined a comprehensive set of personality moderators (Big five, the Dark Triad, attachment-style, self-esteem, and callous unemotionality) and used the largest sample size to date of lab studies evaluating the effects of ostracism. Using the classic Cyberball paradigm, participants randomly assigned to the control condition (n = 89) received an equal share of throws, whereas participants in the exclusion condition (n=181) received only two throws in the beginning of the game. Replicating previous research, participants felt significantly and substantially less need satisfaction when they were ostracized compared to the control condition (d = 2.43). Although a few main effects for personality traits emerged, the findings were largely consistent with the claim that the effects of ostracism are similar across individuals, and may represent a strong situation in which personality traits have little impact. These findings are also consistent with an evolutionary interpretation in which the benefits of group living have created selection pressure for an ostracism-detection mechanism that is strongly reactive to exclusion cues regardless of individual differences in personality.

HATE SPEECH VS. FREE SPEECH: HOW PUBLIC UNIVERSITIES NEGOTIATE THE SPACE IN BETWEEN
Rebecca Sobanski
Category: Social Science: General, Section 2
Location: Lake Superior Room, 1:45 PM
Mentor(s): Elizabeth Drexler (Anthropology)

Public Universities in the US are serving populations of increasingly diverse ethnicity, religion, socio-economic background, and sexuality/gender expression. With such a wide range of backgrounds, universities are presented with the challenge of upholding freedom of speech while also creating a safe, inclusive environment that students feel comfortable learning and living in. For many universities, this means the implementation of speech codes; rules regarding what behaviors and language are acceptable in relation to university sanctioned activities. By comparing well known universities to see how they responded to hate speech claims made by students, faculty, and groups outside of the university, the success of those seeking to challenge hate speech can be seen to correlate to the power of the actor registering the complaint, who the perpetrators of the hate speech were, and the ability of those reporting hate speech to marshal a strong base of support. Looking at the issue of hate speech vs. free speech from an anthropological perspective yields insights as to the social acceptability of certain hate speech, and how this translates into institutional response.

ASKING FOR THE STORIES WE CANNOT TELL: BIAS AGAINST THE NON-RELIGIOUS IN NATIONAL SURVEYS AND AMERICAN POLITICAL RHETORIC
Evan Stewart
Category: Social Science: General, Section 2
Location: Lake Superior Room, 2:00 PM
Mentor(s): Gene Burns (Social Relations and Policy)

While the number of non-religious citizens in the United States has doubled since the 1990's, the open expression of a non-religious identity remains socially and politically marginalizing. The Pew Research Center reports that in 2007 and 2009 an average of 50% of Americas viewed atheists as "mostly or very unfavorable," and in 2011 61% of voting Americans would be "less likely" to vote for a presidential candidate that did not believe in God. This study links social distrust of the non-religious to a privileging in public discourse of one measure of religiosity, "religious centrality." More so than religious attendance or the specific content of belief systems, the centrality of religion to citizens' identities is privileged both formally, in official statistical counts of the population, and informally in political rhetoric. Both trends marginalize the experiences of citizens for whom religion is not a central part of identity and lump the non-religious and atheists together in a single group. The study, then, includes an international comparative analysis of how religiosity is measured in different surveys, especially censuses. In addition, it includes an analysis of religious rhetoric in the U.S. presidency, from the Reagan era to the 2012 Republican political primaries, to illustrate how this national focus on religious centrality solidifies political boundaries between the religious and non-religious and informally reinforces a distrust of the non-religious in the population.

SOCIAL WELFARE
Ernscie Augustin
Category: Social Science: General, Section 2
Location: Lake Superior Room, 2:15 PM
Mentor(s): Matthew Grossman (Political Science)

I am working on research that will demonstrate how federal social welfare policies have changed throughout the years. The years I will focus on will be 1945-2011. The objective of my research is to demonstrate how policies have changed and the actors that played a role in making these implementations. We plan to investigate when and where research evidence influences policy change. Furthermore, we will show how the use of research in policy making depends on the other factors. We will be coding books and articles as a primary method. The current results are broad in presenting different policies that dealt with social welfare. Many of these policies were passed by Congress and some were supported by the president. Further research will be provided to show the process surrounding each enactment in order to understand what evidence was influential and how its influence depended on political context and political actors.

DYNAMICS OF RAPE: A LOCAL EXPLORATION
Chelsea Yondo Annie Norris
Category: Social Science: General, Section 2
Location: Lake Superior Room, 2:30 PM
Mentor(s): Jennifer Goett (Comparative Cultures and Politics)

This paper shows how the system of patriarchy allows for the normalization of masculine violence through the socialization of aggression as an element of the male gender role. By failing to recognize male aggression as a socially constructed gender role, the institutional judicial process implicitly condones this aspect of aggression in the prosecution of rape. Consequently, the prosecution, operating within the cultural context, promotes violence against women by rejecting most rape cases at the complaint filing stage based on lack of evidence and the language of consent. We add to the discussion of previous research and theories on sexual violence against women, state responses to violence, and constructs of masculinity and femininity by exploring how they interact in the context of East Lansing. The findings of this paper enhance our understanding of the particular problems and experiences women face using the insights gathered from interviews with sexual assault advocates, prevention program leaders, law enforcement, and the prosecutor in East Lansing. It must be understood why the context in which men act and the cultural lack of emphasis on the seriousness of sexual violence against women permits its continuation. Our overall analytical insight shows that the prosecution of sexual assault cases is inadequate in bringing justice to assaulted women, evidenced by the limited number of cases tried. Instead, the prosecution system in East Lansing reinforces social norms of masculine dominance by failing to prosecute most sexual assault cases.

Poster Presentations

PRAGMATIC LANGUAGE USE OF CHILDREN WITH A SPECIFIC LANGUAGE IMPAIRMENT: DIFFERENCES ACROSS SCENARIOS
Kelly Lennon
Category: Social Science: General, Section 1
Poster #: 360
Location: Parlor A, 9:30 AM - 11:30 AM
Mentor(s): Claire Vallotton (Human Development and Family Studies)

Typically developing children quickly learn that speech has meaning and can be used in various contexts to ask questions, express feelings, and negotiate activities; which are pragmatic functions of language. Typically developing children change their pragmatic language use with their mothers in different situations (Yont, Snow, & Vernon-Feagans, 2002), but this relationship is unclear in dyads that include children with Specific Language Impairment (SLI). Research related to children with SLI typically focuses on book reading between parents and children (McGinty, Justice, Zucker, & Gross 2012), whereas this study focuses on the pragmatic language use of children with SLI in book reading and a play scenario. Research Questions: (1) What pragmatic language do children with SLI use during book reading and play scenarios? (2) How does the pragmatic language of children with SLI differ between book reading and play scenarios? Method: 41 children with SLI between 48 and 60 months and their mothers participated in this study. A semi-structured interaction was used where children and parents had 10 minutes to interact with four different sets of items, including a book and a set of toy cars which are the two scenarios included in this study. Research Plan: Existing transcripts of these semi-structured scenarios were transferred into the Child Data Language Exchange System software for language analysis, where the Inventory for Communicative Acts-Abridged (INCA-A) coding is currently being completed to analyze the pragmatic language used by parents and children. All videos have been transcribed and over half have been coded using INCA-A.

GENDER DIFFERENCES IN CHILDREN WITH SLI: THE ROLE OF LANGUAGE DEMANDS ON PLAY ACTIVITY PREFERENCE
Stephanie Mondro, Kelly Lennon, Emalee Manns, Chelsea Ozuch
Category: Social Science: General, Section 1
Poster #: 361
Location: Parlor A, 9:30 AM - 11:30 AM
Mentor(s): Lori Skibbe (Human Development & Family Studies), Claire Vallotton (Human Development & Family Studies)

Gender contributes to differences between boys and girls in the areas of language and play in childhood. While boys often prefer mechanical toys such as cars with little language demands, girls regularly prefer toys such as dolls that present the need for more symbolic language. Previous research suggests that children with specific language impairment (SLI) engage in less symbolic play compared to typically developing children. Book reading, which has high language demands, is frequently used to

assess language in parent-child dyads; however these studies do not account for children's preferences for activities with lower language demands. This study aims to examine gender differences in language during play activities and potential differences in preferred play activity between typically developing children, as established by research, and children with SLI. Research Questions: Are girls with SLI more similar to boys in their preference of play activities because of the lower language demands associated with toys typically preferred by boys? Will girls with SLI choose play situations that are not as demanding of language? Method: Videos of 41 parent-child dyads in which there are four play activities will be used. The amount of time a child spends in each activity will be recorded to ascertain the child's preference; the preferences between boys and girls will then be compared. We hypothesize that we will not find gender differences in this sample with SLI, which is contrary to what is found in the literature on typically developing children.

MATERNAL DEPRESSION AND CHILDREN'S EMERGENT LITERACY SKILLS: THE ROLE OF THE HOME LEARNING ENVIRONMENT
Jessica Slone
Category: Social Science: General, Section 1
Poster #: 362
Location: Parlor A, 9:30 AM - 11:30 AM
Mentor(s): Lori Skibbe (Human Development and Family Studies)

We examined the home learning environment (HLE) as a mediator between maternal depression and children's emergent literacy skills. Data consisted of n=181 mothers and their preschool-aged child (95 boys, 86 girls) that were drawn from an ongoing study of child development. Maternal depression was assessed using the Patient Health Questionnaire (PHQ-9; Kroenke, Spitzer, & Williams, 2001). The HLE was measured using a 7-item subscale of the Parenting Questionnaire (Morrison & Cooney, 2002). Letter knowledge (LK) was assessed by showing children 26 randomly ordered alphabet letter flashcards and then asking the latter name. Results indicated that maternal depression was negatively correlated with the HLE ($r = -0.191$, $p = 0.01$). The HLE was positively correlated with children's LK ($r= 0.260$, $p = .000$). While the relationship between maternal depression and children's LK was not significant, it is generally accepted that this direct relationship is not essential to establish mediation (Collins et al., 1998). A series of regression analyses were performed to examine the relation between maternal depression and the HLE, and the HLE and children's LK. Maternal depression was significantly and inversely related to the HLE ($ß = -.052$, $p = 0.010$). There was also a significant but positive relationship between HLE and LK ($ß = 2.667$, $p = 0.00$). A Sobel test of this indirect effect was significant ($z = -2.109$, $p = 0.017$). Results suggest that maternal depression influences children's letter knowledge through the HLE. The poster will present implications for these findings.

MICHIGAN ECONOMIC DEVELOPMENT CORPORATION
Kyle Celebuski
Category: Social Science: General, Section 1
Poster #: 364
Location: Parlor A, 9:30 AM - 11:30 AM
Mentor(s): Matt Grossmann (Political Science)

In my program I am aiming to provide an overview of the Michigan Economic Development Corporation. Through my overview I will provide a history of the MDEC including when and why they were founded, what their original purpose was, and what are some of their more notable past accomplishments. With the history explained I will continue by looking at the MEDC in a contemporary setting by looking at what the MDEC has done in recent years and how their goals have changed over time. Finally I will look to further explain this change through explaining what changes the MDEC have underwent due to the changing of Governors by looking at how Governor Snyder has influenced the MDEC and what he seems to be expecting from them through interviews with people close to the MDEC who will be able to provide me with the best most relevant answers.

PARENTS' GESTURES GIVE SOME CHILDREN THE UPPER HAND
Elizabeth Gutowski, Emily McGrew
Category: Social Science: General, Section 1
Poster #: 365
Location: Parlor A, 9:30 AM - 11:30 AM
Mentor(s): Claire Vallotton (Human Development & Family Studies)

Recently, much research has focused on gestures because they may serve to scaffold learning, allowing learners to gain more than what is presented verbally. However, research has investigated teachers' gestures and their impacts on school-aged

children. This study examines the impact of parents' gestures on very young children's learning. Our prior research found that parents' gesture use while teaching helped their children learn to solve a puzzle more successfully, but only for children 3-4.5 years old and not for younger or older children. Now we wonder do gestures actually help children more during this age period, or do parents use different gestures? We asked: (1)What gestures do parents produce when teaching their children during a puzzle-solving task? (2)Do these gestures differ by child age? Parent-child dyads, with children 1.4-6.0 years old (M=3.6), completed the same puzzle during three trials: (1)Pre-Help child only, (2)Parental Help, (3)Post-Help child only. Parents' gestures during the help phase were coded by applying six mutually exclusive categorical codes (embodied action, demonstration, iconic/representational, indexical, helping, other) to parents' hand, arm, and shoulder movements. Results showed that there were differences in parents' use of index gestures ($F=3.716, p<.05$), particularly tap/show index gestures ($F=7.963, p<.01$), which varied by child age group. Overall, the parents' gestures differed significantly for the younger group compared to the middle and older groups. Thus, adding these results to our previous findings, we conclude that children in the middle age range may be more sensitive than older or younger children to parents' use of gestures.

THE CHANGING USE OF STEREOTYPES IN INDIANS AT WORK
Hannah Selig
Category: Social Science: General, Section 1
Poster #: 366
Location: Parlor A, 9:30 AM - 11:30 AM
Mentor(s): Mindy Morgan (Anthropology)

The periodical Indians at Work, which was printed between 1933 and 1945 by the Bureau of Indian Affairs provides a snapshot into the mindset of the American Government and American public during a tempestuous time. Under the tenure of John Collier, the head of the BIA, policies towards Native Americans underwent rapid transformation. Indians at Work allows the researcher to look at first hand writings by Collier and others both on the reservations and at the BIA and discover the trends in their thinking. In this presentation I will delve into how the racial stereotypes about Native groups evolved and how these stereotypes would have been influenced by outside factors such as the New Deal and World War II.

IDENTIFYING DIFFERENT CULTURAL GROUPS AT A MULTI-ETHNIC ARCHAEOLOGICAL VILLAGE
Rachel Wise
Category: Social Science: General, Section 2
Poster #: 370
Location: Gold Room, 1:30 PM - 3:30 PM
Mentor(s): Jodie Ogorman (Anthropology), Frank Raslich (Anthropology), Andy Upton (Anthropology)

Can pottery be used in confirming the identification of domestic structures that belonged to Mississippian and Oneota groups? Archaeologists at this AD 1300 site have used architecture to assign cultural affiliation to houses; this study looks at pottery types found within the houses to independently assess the identification of groups associated with houses. House 7 and House 8/9 have been identified as Oneota and Mississippian based on the structure of the buildings; primarily the use of wall trenches (Mississippian) vs. wall posts (Oneota). From what we know of Mississippian and Oneota people in this region and beyond, they had different pottery decorating techniques; Mississippians used cord marking and Incising for decorating, while the Oneota used trailing and punctates. By looking at the difference in pottery decoration between houses I test whether these two remnants of material culture follow a consistent pattern, which will contribute ongoing research at the site dependent upon recognizing cultural affiliations.

THE BROAD-RIMMED BOWL: A DESCRIPTIVE STUDY AND ANALYSIS
Joshua Lieto
Category: Social Science: General, Section 2
Poster #: 371
Location: Gold Room, 1:30 PM - 3:30 PM
Mentor(s): Jodie O'Gorman (Anthropology)

The aim of this project is to describe the physical characteristics and spatial distribution of the broad-rimmed bowl of the artifact assemblages from the Morton Village site (11-F-2) of prehistoric West-Central Illinois. This artifact type is of particular interest because it is the clearest example of what could be described as an inter-ethnic hybrid of material culture resulting from the interaction of two groups of people identified archaeologically as Oneota and Mississippian in the Central Illinois River

Valley. The ceramic form is commonly found on Mississippian sites in the region, and is virtually unknown Oneota sites anywhere but here. Decorative motifs at Morton, however, are Oneota. No studies of broad-rimmed bowls at the site has been undertaken, and this study offers the first quantitative and descriptive information. In addition to providing information about the Morton site in particular, this project will contribute to ongoing research aimed at a better understanding of the interaction between these groups of people in the region.

PREHISPANIC CHOCOLATE FOR TARASCAN KINGS: DETECTION OF CACAO IN SPOUTED ELITE SERVING VESSELS
Joshua Lieto
Category: Social Science: General, Section 2
Poster #: 372
Location: Gold Room, 1:30 PM - 3:30 PM
Mentor(s): Helen Pollard (Anthropology)

The aim of this project is to examine the association of the Tarascan spouted ceramic vessel with cacao. Centered around what is today the state of Michoacán in west Mexico, the pre-Columbian Tarascan state arose in the early fourteenth century and lasted until it was overtaken by Spanish forces in the 1530's. Associated with the rise of the state is the spouted ceramic vessel, a form common to West Mexico in the 1400's. Based on chemical studies done on similar vessels in other areas of Mesoamerica, this form been linked closely with the consumption of cacao via detection of cacao's biomarker, Theobromine, on the inner surfaces of vessels. We hypothesize that this form rose to prominence in Tarascan ceramic assemblages due to the empire's expansion into areas where cacao was traditionally cultivated, and is connected to the ability of the Tarascan king to demand tribute from those areas in the form of cacao. We will test this hypothesis by chemically analyzing spouted vessel sherds for Theobromine against a control group of sherds from pottery that was definitively not involved in cacao consumption. This project is of interest because it will shed light on interaction and tribute networks within the Tarascan empire, the rise of the state as connected with these tribute networks and help develop a larger understanding of cacao usage in the Tarascan domain. More generally, it will also serve as the first step in finally assigning a function to the ubiquitous west Mexican spouted vessel.

ARCHITECTURAL VARIATION AT MORTON VILLAGE
Ryan Jelso
Category: Social Science: General, Section 2
Poster #: 373
Location: Gold Room, 1:30 PM - 3:30 PM
Mentor(s): Jodie O'Gorman (Antrhopology), Frank Raslich (Anthropology), Andy Upton (Anthropology)

Morton Village (11F2) has been excavated by Michigan State University in partnership with the Dickson Mounds Museum since 2008. The data collected suggests that the area adjacent to and including the village was occupied through time by different cultural groups. Differences in structural patterns, along with other material culture, suggest that these groups are of Oneota and Mississippian origin. Oneota structural building techniques are described as a single post pattern, where they place each post individually. Mississippian structural building techniques are described as wall trench pattern, where a single trench is dug and posts are placed into it. Each of these patterns are easily identified in the archaeological record. Their identification and presence at the site have led researchers to examine two main working hypotheses about the occupations of these groups at Morton Village. The cohabitation hypothesis suggests both groups occupied the village contemporaneously. In contrast, the separate occupation hypothesis proposes that each group existed in the area at different time periods. Evaluation of these hypotheses is complicated by the fact that sometimes both patterns are present in a single structure. This analysis will be primarily descriptive, but will also use metric data on intra-site post molds to examine the possibility of correlations between post mold variables, other structural data, and assumed cultural affiliation. This will aid in gaining a better understanding of the variation in architectural remains at the site.

THE EVOLUTION OF MICHIGAN STATE UNIVERSITY CAMPUS LANDSCAPE
Eve Avdoulos
Category: Social Science: General, Section 2
Poster #: 374
Location: Gold Room, 1:30 PM - 3:30 PM
Mentor(s): Lynne Goldstein (Department of Anthropology)

What began as 676 acres of dense woodland would eventually develop into what we know today as Michigan State University. The campus has evolved both physically and socially over its one hundred and fifty-seven year history. By looking at these physical and social changes, one can follow the migration of the location of the "heart" or the center of campus. This concept of where the center of campus is located is important in deciphering the reason behind landscape changes and growth as well as how the social center has changed and its subsequent affect on the students' perception of campus. By looking at physical changes, such as location of building construction, land use, and placement of monuments as well as social changes such as traditions, academic structure, and student events, we can gain a better understanding of the evolution our campus landscape. This research has been divided into six time-based categories. The Campus Archaeology Program establishes the first four, while the last two are constructed based on the information found relevant to this research. The phases are as follows: Phase I: 1855-1875, Phase II: 1875-1900, Phase III: 1900-1925, Phase IV. 1925 – 1955, Phase V: 1955 – present era, Phase VI: future. In each phase, both the physical and social changes are examined and reflected upon in relation to how this has shaped where the center of campus is located.

USING CERAMICS TO UNDERSTAND MSU'S PAST
Circe Wilson
Category: Social Science: General, Section 2
Poster #: 375
Location: Gold Room, 1:30 PM - 3:30 PM
Mentor(s): Lynne Goldstein (Anthropology)

The Campus Archaeology Program (CAP) tries to examine and protect the history and prehistory of the land occupied by Michigan State University. This means that CAP does research in a variety of different places across campus, based on construction and/or research questions. My research project asks the following question: What do the different types of historic ceramics found by CAP tell us about early MSU's campus life? I first had to read basic information determining the different types of artifacts that are commonly found on sites and in this context. The next step is to analyze the ceramics based on type collections. By the time that my research is completed, I should be able to develop interpretations about those who lived here based on the different types of ceramics they've used and what they were used for. I hope to be able to equate my findings with topics such as socioeconomic status and specialized purpose ceramics.

THE DEVELOPMENT OF CHILDREN'S VERBAL EXPLANATIONS OF INEQUALITY AVERSION
Justin Cochran, Torin Kulhanek
Category: Social Science: General, Section 2
Poster #: 376
Location: Gold Room, 1:30 PM - 3:30 PM
Mentor(s): Cary Roseth (CEPSE)

Using forced-choice methodology, previous research suggests that inequality aversion emerges at 5- or 6-years-old. Yet no previous work has examined children's verbal responses to unequal propositions such as being offered one sticker in exchange for one token while another child is offered six stickers for one token. This study examined 76 children's (ages 5- to 8-years-old) unsolicited verbal responses to inequality in the presence of a same-sex, same-age peer. The experimental paradigm included four conditions: disadvantageous inequality (being offered 1 sticker while another child is offered 6), advantageous inequality (6 vs. 1), high equality (6 vs. 6), and low equality (1 vs. 1). As predicted, 5- and 6-year-olds' expressed concern for disadvantageous inequality, while 7- and 8-year-olds' expressed concern for both disadvantageous and advantageous inequality. Results have theoretical and practical implications regarding cognitive and emotional interactions underlying the development of children's inequality aversion.

THE EFFECTS OF WITNESSING AND EXPERIENCING FAMILIAL VIOLENCE: GENDER DIFFERENCES AMONG FILIPINO ADOLESCENTS
Alicia Vanden Bussche
Category: Social Science: General, Section 3
Poster #: 380
Location: Gold Room, 1:30 PM - 3:30 PM
Mentor(s): Shelia Royo Maxwell (Criminal Justice)

Research has shown that there has been a major increase in cases of familial violence over the past years; however, it has only been in the past three decades that studies have started showing importance in the lens and influence of children's exposure to family violence. Children and adolescents who witness familial violence are rarely the focus of abuse research; consequently the need to understand the relationship between gender and exposure to familial violence. There are many issues surrounding familial violence in research, yet, one of the less voiced is the generalizability of the effects of family violence beyond Western societies, due to the fact that most studies have examined the effects of family violence on children and adolescents using Western samples. By utilizing a sample of adolescents from a medium-sized city in the Philippines, the purpose of this research is to illustrate gender differences in adolescent delinquency against a framework of childhood exposure to both witnessing and experiencing family violence in a non-Western country. This study uses a sample of youth living in the Philippines to better inform researchers about generalizing the effects of family violence on youth behaviors among cultures.

HOW GESTURE AFFECTS PARENTS' PRAGMATIC LANGUAGE
Emily McGrew, Elizabeth Gutowski
Category: Social Science: General, Section 3
Poster #: 381
Location: Gold Room, 1:30 PM - 3:30 PM
Mentor(s): Claire Vallotton (Human Development and Family Studies)

Communication is multi-modal, involving both words and gestures. Parents and teachers use words and gestures in complementary ways when teaching children. Research shows that learning and memory are affected when learners are prohibited from gesture use. (Goldin-Meadow, 1999). In this study we examine how teaching is affected when gestures are limited for the teacher. In a task where parents act as teachers we asked: (1) What type of pragmatic language do parents use when they talk to their children in problem-solving situations? (2) Are there specific differences in the pragmatic content and amount of language used by parents who can use gestures and those who cannot? 126 children (63 boys) between 16 months and 6 years and their parents participated in the study. Children completed the same puzzle during three trials: (1) Pre-Help child only, (2) Parental Help, (3) Post-Help child only. For the Parental Help phase, dyads were randomly assigned to one of two conditions: (1) Hands (parent free to use hands) or (2) No Hands (parents were asked to sit on their hands). The parent help phase was transcribed and coded using the Inventory of Communicative Acts (INCA). By analyzing pragmatic language use, we hope to understand if teaching is impaired when gestures are limited, or if language compensates for lack of gesture. These results will help us understand what types of language may be most helpful for children in learning situations, as well as the role of gestures in teaching and learning.

UNDERSTANDING NON-ELITE MISSISSIPPIAN SOCIETIES: A MORTUARY ANALYSIS OF THE EAST ST. LOUIS STONE QUARRY
Kaitlin Scharra
Category: Social Science: General, Section 3
Poster #: 382
Location: Gold Room, 1:30 PM - 3:30 PM
Mentor(s): Lynne Goldstein (Anthropology)

Over the past thirty years Mississippian cemeteries have been a source data used to help develop an understanding of the associated societies. These societies, which resided in the American Bottom from 900 A.D. to 1600 A.D, have differed from complex chiefdoms to simpler rural villages. Most noted of these societies is that of Cahokia, the signature hierarchy of the time, however there has been a lack of research done on those societies without hierarchies. This presentation will be an analysis of one such society that used The East St. Louis Stone Quarry Cemetery. This site was dated to have been used from 1250 A.D to 1400 A.D, and contained a central charnel house surrounded in a circular fashion by grave pits. A total of 96 skeletons were found making this site the most complete skeletal collection from this two and a half century span. In examining this site multiple aspects of the data will be examined including grave location, age and gender correlations, disposition of remains, and grave goods. My findings will show if there is a relationship between these elements and how they

are reflective of this prehistoric society. This research will add to the understanding of the prehistoric societies of the American Bottom outside of Cahokia.

REINTEGRATING RETURNING POLICE VETERANS: AN EXAMINATION OF LAW ENFORCEMENT PROGRAMS
Sarah Keppler
Category: Social Science: General, Section 3
Poster #: 383
Location: Gold Room, 1:30 PM - 3:30 PM
Mentor(s): Steven Chermak (Criminal Justice)

This study examines whether law enforcement agencies offer any programs to their returning police veterans. Many law enforcement officers are active duty reservists, and the transition from military conflict back to the streets may be particularly challenging, as many veterans experience Post Traumatic Stress Disorder (PTSD). Although the risks and dangers are considerable, we know very little about the types of programs that are available to law enforcement officers post military conflict. The method used in this study was telephone interviews. We sampled 145 law enforcement agencies in Michigan. This study found that not a single agency had programming designed to specifically assist veterans who were returning to a police agency. Seventy five percent of the agencies incorporated stress into their general training protocols, but only 35 percent actually had specific programs to handle officer stress. Larger agencies were more likely to have more programs and training related to dealing with stress, and were also more likely to offer active support to their veterans than smaller and medium sized law enforcement agencies. Implications for policy and future research are discussed.

A STUDY OF THE ASSOCIATIONS BETWEEN BIRTH ORDER, SEX AND GENDER DISTRIBUTION OF PREVIOUS SIBLINGS WITH OFFSPRING SURVIVAL IN RURAL COMMUNITIES OF KENYA
Janine Baranski
Category: Social Science: General, Section 3
Poster #: 384
Location: Gold Room, 1:30 PM - 3:30 PM
Mentor(s): Masako Fujita (Anthropology)

BACKGROUND: There have been studies on the factors associated with infant mortality, in particular gender and birth order, with mixed results. OBJECTIVE: The purpose of this study was to examine possible associations between offspring survival and three variables: birth order, offspring sex and sex distribution of older siblings. We used reproductive histories of 241 breastfeeding mothers to gather data about the offspring (n=612) from interviews conducted in communities of rural Kenya. METHODS: We used descriptive analysis and ?2-tests to examine the associations between offspring survival and birth order, sex of the offspring and the sex distribution of older siblings. RESULTS: The overall percentage of offspring deaths was 6.4%. There was a significant association between birth order and offspring survival (?2=5.128, p-value=0.077) showing that firstborns died more often than later-born. Overall sex and offspring survival did not have a significant association; however, when examined at each birth order there was a marginally significant association for 2nd birth order offspring (?2 = 3.784, p-value = 0.052) showing that 2nd born females died more often than 2nd born males. The gender distribution of previous siblings was significant for 2nd and 4th birth order offspring (?2 =5.046, p-value = 0.080; ?2=9.775, p-value = 0.021 respectively). Having female older siblings increased survival and having male older siblings decreased survival. CONCLUSION: Our data indicate that birth order may be an important factor for predicting offspring survival in this population and the sex distribution of older siblings may be important for second and fourth born offspring.

ORGANIZING AN INTERNATIONAL CONFERENCE ON THE STUDY OF RELIGION
Travis Dodge
Category: Social Science: General, Section 3
Poster #: 385
Location: Gold Room, 1:30 PM - 3:30 PM
Mentor(s): Arthur Versluis (Religious Studies)

As an undergraduate research assistant I have been very involved in the planning process for an international academic conference on religion to be held in California from July 19-22, 2012. I have seen, from the ground up, what it takes to put out a call for papers, how proposals must be evaluated, and how everything needs to be systematically documented. My responsibilities in planning this conference include working alongside the conference organizers, receiving proposals and

making sure the proposals get sent out for peer review, tallying the votes that are sent back from separate conference committee members, alerting those that have submitted proposals if they are accepted or rejected or if they need to revise their proposal, and interacting with those who are submitting proposals. Another duty of mine as an undergraduate research assistant has been working on the publication of a collection of articles due to be released this summer. This collection is titled Esotericism, Religion, and Politics. Through working on this publication, I have been involved in the collection and editing of articles and how those articles will fit together in one collection of work. My responsibilities in working on this collection of articles include corresponding with the authors as far as their corrections to the articles, putting in place the edits that the authors or editors have decided are necessary, and assembling all elements of an article into something cohesive and readable.

CULTURAL DIFFERENTIATION: CHERT COLOR AT MORTON VILLAGE
James Schwaderer
Category: Social Science: General, Section 3
Poster #: 386
Location: Gold Room, 1:30 PM - 3:30 PM
Mentor(s): Jodie O'Gorman (Anthropology), Frank Raslich (Anthropology), Andy Upton (Anthropology)

Color has been a significant factor in the choice of many things from war paints to ceremonial artifacts and more for people throughout the world. Preliminary analysis of a differentiation between light and dark colored cherts at Morton Village has produced a statistically significant result. This project is designed to further test if color is a significant factor for selecting chert used in projectile point manufacturing at Morton Village by establishing a finer division in the color scale. The establishment of color as a significant factor can be used to determine if the Oneota and Mississippian favored one color of chert over another. The data set for my research is the chert projectile points, both broken and complete, collected during the 1984-1986 excavations along with points collected from the 2008 Michigan State University field school excavation. These data compares the culturally-affiliated context location within the site to the color of the artifact. I am recording the color based on the Munsell color book. By using the Munsell color book I am able to refine the shade distinction between the previous categories of “light” and “dark.” Through this finer scale of resolution, I will be able to determine if color is a statistically variable between structures and within the site as a whole.

Social Work

Poster Presentations

STRENGTHENING DEVELOPMENT RESILIENCIES THROUGH SERVING AS MENTORS TO AT RISK YOUTH
Sarah Williams, Courtney Wilson
Category: Social Work, Section 1
Poster #: 390
Location: Gold Room, 9:30 AM - 11:30 AM
Mentor(s): Joanne Riebschleger (Social Work)

This project evaluates the outcomes of the MSU Foster Youth Alumni Services Program, also known as Foster Academics-Mentoring Excellence (FAME). MSU students who are mostly foster care alumni served as leaders and camp "counselors" for the high school residential program held each August. Investigators wondered to what extent participation in the summer camp as counselor/mentor may have impacted the lives of the MSU student volunteers. The research questions are: 1. How do Michigan State University students describe their services learning experiences as mentors to high school youth who are transitioning to adult life? 2. What are the university graduation, employment, and continued services learning participation rates for MSU students who mentored high school age foster care youth in "foster care camp" program designed to expose foster care youth to higher education and employment opportunities? The assumptions underlying this study are, that if the debrief information from camp was accurate, university student "counselors" may report specific life impacts drawn from the satisfaction of helping others. This may lead to changes, albeit small changes, in the way they think, feel, and act - leading, perhaps to a re-dedication to their studies, life goals, and subsequent services learning activities.

THE SUPPORT NEEDS OF WOMEN IN JAIL: IMPLICATIONS FOR SOCIAL WORK SERVICE DELIVERY
Amanda McCormick, Amanda Freis
Category: Social Work, Section 1
Poster #: 391
Location: Gold Room, 9:30 AM - 11:30 AM
Mentor(s): Sheryl Kubiak (Social Work)

Women involved in the criminal justice system are an underserved population with specific needs, based on high rates of mental illness, substance abuse, and trauma histories (Green et al., 2005; Pennell & Burke, 2003; Teplin et al., 1996; Tusher & Cook, 2010). Few services exist that take into account the combination of challenges faced by this population (Green et. al, 2005). This gap is concerning given that support both from the institution and friends and family influence women's incarceration experiences (Lindquist, 2000), parenting (Arditti, Lambert-Shute, & Joest, 2003), and reoffending rates (Visher & Travis, 2003). However, few studies have looked at the specific support needs for women both within and outside of the jail. This study utilizes a sample of 231 women from an urban, Midwestern jail who were surveyed to answer the following research questions: What types of support are women receiving from inside the jail (i.e. support groups, mental health services)?; What types of needs do women have from outside supports?; Are women receiving the types of supports for mental health that they need while in jail? Women's responses to a variety of closed and open-ended questions about support and measures of mental health provided insight into their needs for support inside and outside of jail. The findings shed light on what is lacking for women in the criminal justice system. This work can be used to inform social work service delivery and interventions specific to this population.

EVIDENCE-BASED PRACTICE, MENTAL HEALTH SERVICES, AND OLDER ADULTS: THE CURRENT STATE OF RESEARCH
Megan Fritsch
Category: Social Work, Section 1
Poster #: 392
Location: Gold Room, 9:30 AM - 11:30 AM
Mentor(s): Amanda Woodward (Social Work)

The purpose of this study is to review the current state of research on mental health services for older adults. It will address questions about the types of services and interventions being studied for older adults with mood disorders, the outcomes being targeted, the research methodologies being used, the strengths and weaknesses of the studies, and the evidence base they

provide. The method being used is a broad systematic review that includes both qualitative and quantitative studies, using articles published between 2007 and 2010 that are specific to older adults diagnosed with depression. Articles that have been excluded are those that contain pharmacological treatments. The type of data that has been collected from each article includes citation, study objective, study design, population, description of service or intervention, outcomes targeted, main findings, and strengths and weaknesses. The result of the literature review is that the types of treatments being studied may be divided into two categories, psychology related and active interventions. The psychological treatments include Problem-Solving Therapy, Cognitive Behavioral Therapy, psychoeducation, life course review, and depression management, while the active interventions include exercise, light therapy, religion, and Reiki treatment. The outcome of the different treatment methods is the measurement of depressive symptoms. Results of these studies have shown an overall improvement in depressive symptom for the older adult participants. It may be concluded that the current studies have provided evidence of successful treatments for depressive symptom improvement in older adults and suggests that non-pharmacological treatments are an effective and reasonable alternative.

SCHOOL QUALITY FOR ELEMENTARY-AGED CHILDREN IN FOSTER CARE
Molly Ballantyne
Category: Social Work, Section 1
Poster #: 393
Location: Gold Room, 9:30 AM - 11:30 AM
Mentor(s): Sacha Klein (Social Work)

Research demonstrates that foster children tend to have poor educational outcomes (Stone, 2007). There is evidence that high rates of school mobility among foster children may be partly to blame (Blome, 197; NSCAW, n.d.). This has resulted in policies like the Fostering Connections for Success Act of 2008, which guarantees foster children the right to continue attending their 'school of origin' even when they are placed outside the school's attendance area. However, in the rush to address the negative impact of school mobility on foster children, the issue of school quality has been largely overlooked (for an exception see Smithgall et al., 2004). Our study addresses this gap by examining the quality of schools attended by elementary-aged foster children in Long Beach, California during June 2010. Using schools as our unit of analysis (N=29), we regressed Long Beach Unified School District (LBUSD) elementary school API scores and teacher-to-pupil ratios on the number of foster children enrolled in each school. The relationship between teacher-to-pupil ratios and foster child enrollment was not significant, but API scores were inversely related to foster child enrollment (B=-11.25, p<=0.02). Schools attended by foster children were generally low performing (API M=809.00; range=755-919, SD=43.35). These findings highlight the importance of considering school quality, not just school mobility, when making educational decisions for foster children. The poster presentation will include a chloropleth map, created in ArcGIS, of LBUSD elementary school attendance areas that depicts the relationship between API scores and foster child enrollment.

HEAD AND OBESITY
Siobhan O'Laoire
Category: Social Work, Section 1
Poster #: 394
Location: Gold Room, 9:30 AM - 11:30 AM
Mentor(s): Kyunghee Lee (Social Work)

The purpose of the current study is to examine the impacts of Head Start on children's nutritional outcomes. Children in Head Start receive comprehensive free services, including early education and development, medical, dental, mental health, nutrition, parental involvement, and other social services. According to Head Start Program Performance Standards and Other Regulations there are number of terms each Head Start must follow to ensure children receive appropriate number of quantity and high quality food. It also mandates to assess children's nutrition-related data such as height and weight. The present study examines the effects of the duration of Head Start enrollment on children's weight and height outcomes (Body Mass Index), using data collected in collaboration with Michigan's Capital Area Community Services Head Start Early Childhood programs across 60 Head Start classrooms (www.cacsheadstart.org). Study questions are as follows: (a) Do Head Start children's baseline characteristics differ among those who enter at age 3 and enrolled in Head Start for 1 year, those who entered at age 4 and stayed for 1 year, and those who entered at age 3 and stayed for 2 years? (b) Do children's weight outcomes differ among the three groups? (c) Do these effects differ depending on the number of family risk factor a child has upon entry? Findings have implications about the benefits of Head Start on children's nutrition outcomes by suggesting early and longer duration of enrollments, particularly for children with high risk factors.

"THE UNHOLY TRINITY:" EXAMINING RELIGIOSITY AND SPIRITUALITY IN THE LIVES OF AFRICAN AMERICAN WOMEN
Bria Berger
Category: Social Work, Section 1
Poster #: 395
Location: Gold Room, 9:30 AM - 11:30 AM
Mentor(s): Marya Sosulski (Social Work)

The intersection of cultural values, race, and gender impacts African American women's unique mental health needs. Cultural stereotypes and stigma regarding mental health treatment often prevents them from seeking clinical treatment from service providers. In addition, religiosity, spirituality, and prayer are often overlooked as informal coping resources in literature regarding mental illness. The following research examines how African American women's historical experiences with religiosity, spirituality, and prayer are described and related to their experiences of mental illness and help-seeking behavior. The methodology includes a qualitative analysis of interviews conducted with eight African American women with Axis I mental illnesses. The interviews detail their personal histories of childhood and family life, education, religious experiences, and discrimination and stigma. The data were analyzed for cross-cutting themes and experiences in the context of hermeneutic significance. Analyses revealed a high incidence of familial and childhood religious affiliation, self-identifying as spiritual in adulthood, cultural beliefs of fatalism, and prayer as a coping mechanism. Mental health needs for minorities often differ from needs of the dominant culture, and because people in minority groups may be reluctant to seek treatment, the available research on these populations is lacking. Thus, the resulting data will contribute to the literature in several in several different areas. Information from this analysis can also be used to create culturally competent and inclusive mental health services, as well as providing a framework for future research on mental health care in minority populations.

ETHNIC DIFFERENCES IN INTIMATE PARTNER VIOLENCE AND HELP SEEKING STRATEGIES IN COLLEGE STUDENT RELATIONSHIPS
Caelyn Ditz, Megan Kelly
Category: Social Work, Section 1
Poster #: 396
Location: Gold Room, 9:30 AM - 11:30 AM
Mentor(s): Hyunkag Cho (Social Work)

Intimate partner violence (IPV) is violence experienced between intimate partners, including psychological, physical, and sexual violence. The purpose of this study was to examine the relationships between self-identification of participation in abusive dating relationships and help seeking behaviors. The study aims to examine the ethnic differences of Michigan State University students in their experiences of IPV and help seeking behaviors. A survey from a random sample of 2000 undergraduate students at Michigan State University was conducted during the fall 2011 semester. An online survey, utilizing the software Survey Monkey, was emailed to the 2000 students. Appropriate statistical procedures were used to examine the rates at which students of different race and gender reported abuse. The study conducts comparisons by groups, including gender (male, female) and racial groups (Asian, Black, Hispanic, Non-Hispanic White, Other) for major dependent variables. Several types of abuse were examined in the survey administered, including psychological, verbal, physical, and sexual perpetration. The survey results compare the students' likelihood of seeking help and to from whom they would seek help. The results showed that informal sources of help are sought after far more than formal assistance for students who have experienced IPV.

CMH ADULT SERVICES: RECOVERY ENHANCING ENVIRONMENT STUDY (REE)
Alison Thierbach, Heather Foster
Category: Social Work, Section 1
Poster #: 397
Location: Gold Room, 9:30 AM - 11:30 AM
Mentor(s): Marya Sosulski (Social Work)

Community Mental Health Authority (CMHA) provides a wide range of community-based services to enhance clients' recovery process. The purpose of this study is to examine both individual responses to treatment and services, as well as structural/institutional environments toward enhancing recovery. Project goals include finding ways that CMHA programs and services can more effectively and efficiently meet consumers' needs. This project will employ a mixed-methods approach. Descriptive statistics will be compiled utilizing data from the Recovery Enhancing Environment measure (REE). The original survey was conducted for the first time in 2010. Preliminary results from the 2010 administration of the REE indicate that

CMHA scored high in the overall recovery elements and scored above the state average in the consumers' involvement in recovery. The 2012 administration will be the second implementation of the survey, composing a longitudinal study. Development of new methods, including focus groups and in-depth interviews, will address more specifically the clients' needs in the recovery process. Additional demographic data focused on minorities will strengthen an understanding of diverse clients' experiences with CMHA. The results of this longitudinal study will contribute to the enhancement of services to people with severe mental illness in their recovery process.

Research Mentors

Many thanks to the dedicated faculty mentors who guided and supported the undergraduate research and creative activities presented today.

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Jetze Tepe, Chemistry
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Jon Walton, Plant Biology
Kenneth Waltzer, Jewish Studies
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Stephanie Watts, Pharmacology and Toxicology
Patty Sue Weber, Large Animal Clinical Sciences
Lisa Whiting-Dobson, TISM
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Barry Williams, Zoology, Microbiology and Molecular Biology
Deborah Wilson, Large Animal Clinical Sciences
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Jeff Wray, English
Lily Yan, Neuroscience
Shanti Zaid, African American Studies
Geri Zeldes, Journalism
David Zhu, Psychology
Karin Zitzewitz, Art, Art History, and Design

Index of Presenters

Student participants are listed alphabetically by last name.

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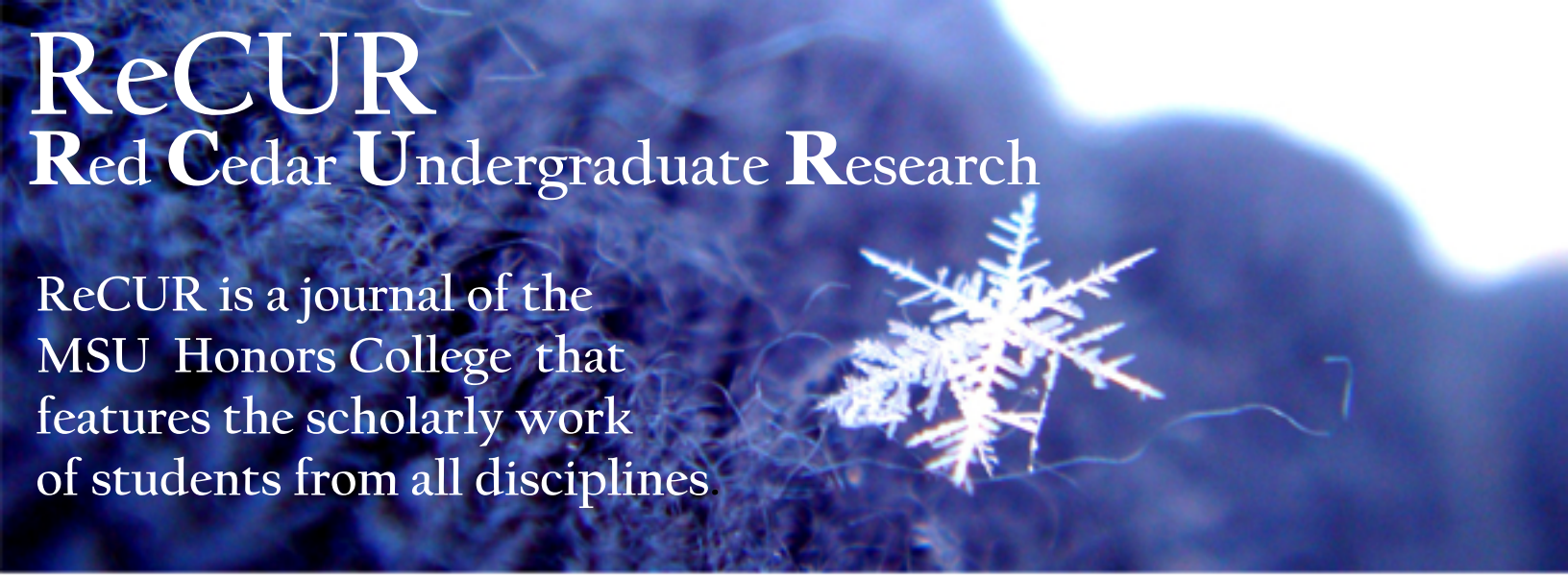

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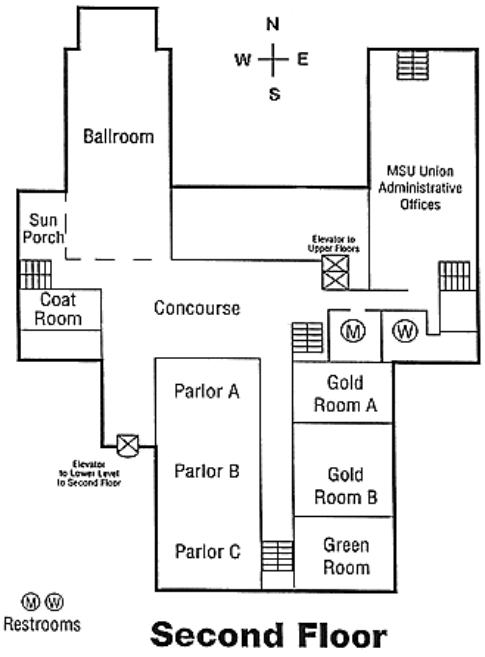

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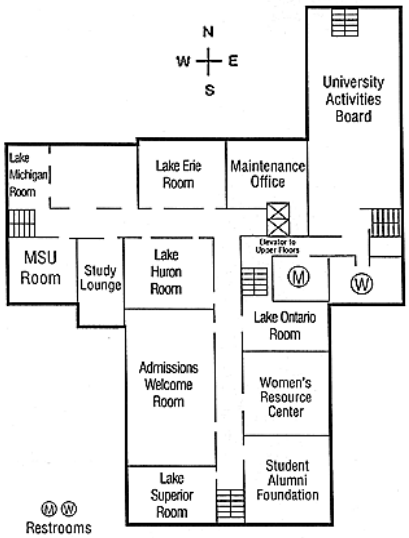

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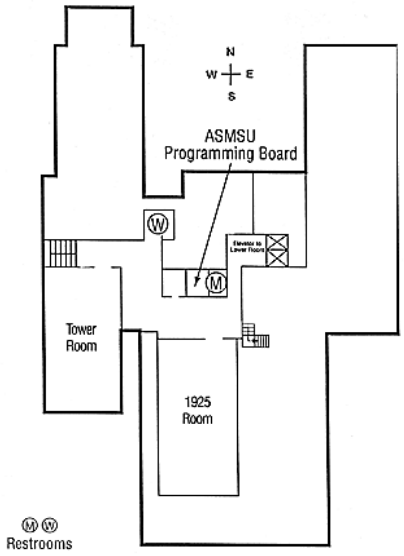

Fourth Floor

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