University **Undergraduate Research & Arts** Forum

Michigan State University

APRIL 16, 2010

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Welcome to the twelfth 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 533 students from 14 different colleges are participating in today's event.

As one of the nation's leading research institutions, MSU offers a breadth of options 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 the student participants, faculty members, 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-Elmoore from the Honors College; several undergraduate associate and assistant deans, and Dr. Korine Wawrzynski, Director of Undergraduate Research. We thank the many dedicated faculty mentors who guided the research projects and creative activities presented today, as well as those faculty members serving as judges.

We offer special thanks to the UURAF Team—Robert Coffey, Alysha Keegan, and Juliette Niemi—all from the Associate Provost for Undergraduate Education's Office—for assisting with the coordination of this event and to the nearly 100 faculty and staff members from across campus who volunteered their time to help make today run smoothly. Thank you.

The cover art was designed by Kevin Folk, Studio Art, '10.

Awards Ceremony

To recognize exemplary scholarly achievements, monetary prizes will be awarded. One first-place award ($100)* will be given in each poster, oral presentation, and performance demonstration category. In addition, two grand prizes 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 ABC during which the prize winners in the various categories will be announced. We encourage all participants to stay for the awards ceremony and invite their families, friends, 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.

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Looking for a Particular Student?

Refer to the Student Index that begins on page 106 for the page number that will provide the student's presentation time, room location, and program abstract.

UURAF 2011 is scheduled for Friday, April 8, 2011.

2010 UURAF Schedule-at-Glance

All events occur in the MSU Union

Event/Time	Location
MORNING REGISTRATION 8:45 AM - 9:15 AM—Registration for morning oral and poster programs	2nd Floor Concourse
ORAL PRESENTATIONS, 9:30 AM – 12:30 PM 9:00 AM- 9:30 AM—Download PowerPoint presentation onto computers 9:30 AM – 12:30 PM—Presentations delivered throughout morning	Parlors A, B, and C Green Room Lake Erie Room Lake Huron Room Lake Superior Room Tower Room
POSTER DISPLAYS, 9:30 AM – 11:30 PM 8:45 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 posters	Ballroom Gold Rooms A & B
Morning Snack Break: 8:30 AM – 11:00 AM in the 2nd Floor Concourse *The morning snack break is generously sponsored by the Division of Residential & Hospitality Services*	
Break to Reset Rooms for Afternoon Sessions 12:00 PM – 1:00 PM	
AFTERNOON REGISTRATION 12:00 PM – 12:45 PM — Registration for afternoon oral programs 12:45 PM – 1:15 PM — Registration for afternoon poster programs 12:30 PM – 3:00 PM — Registration for performance demonstrations	2nd Floor Concourse
ORAL PRESENTATIONS, 1:00 PM – 3:30 PM 12:30 PM – 1:00 PM —Download PowerPoint presentation onto computers 1:00 PM – 3:30 PM — Presentations delivered throughout afternoon	Parlor A Green Room Lake Erie Room Lake Huron Room Lake Superior Room Tower Room
POSTER DISPLAYS, 1:30 PM – 3:30 PM 12:45 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 posters	Ballroom Gold Rooms A & B
PERFORMANCE DEMONSTRATIONS, 1:00 PM – 3:15 PM 1:30 PM – 3:15 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, & guests are encouraged to return for the awards ceremony.	Parlors A,B, & C

Poster Presentations

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

Location: Ballroom	Location: Gold Room
Communication Arts & Sciences	Biochemistry & Molecular Biology-Group 1
Environmental Sciences & Natural Resources-Group 1	Cell Biology, Genetics & Genomics- Group 1
Health, Food & Wellness	Cell Biology, Genetics & Genomics- Group 2
Microbiology-Group 1	Education-Group 1
Microbiology-Group 2	Engineering, Math, & Computer Science-Group 1
Physical Science	Social Science-Group 1
Psychology-Group 1	
Psychology-Group 2	

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

Location: Ballroom	Location: Gold Room
Agriculture & Animal Science	Biochemistry & Molecular Biology-Group 2
Environmental Sciences & Natural Resources-Group 2	Cell Biology, Genetics & Genomics- Group 3
Humanities & Performing Arts	Education-Group 2
History, Economics & Political Science	Engineering, Math, & Computer Science-Group 2
Microbiology-Group 3	Social Science-Group 2
Microbiology-Group 4	Social Science-Group 3
Psychology-Group 3	

Oral Presentations

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

Category	Room Location
Agriculture and Animal Science	Parlor A
Cell Biology, Genetics, and Genomics	Parlor B
Digital Media-Group 1	Green Room
Environmental and Natural Resources	Parlor C
History, Political Science, and Economics	Tower
Humanities & Performing Arts-Group 1	Lake Huron
Psychology	Parlor C (from 11:45 AM -12:45 PM only)
Social Science-Group 1	Lake Erie
Social Science-Group 3	Lake Superior

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

Category	Room Location
Communication Arts & Sciences	Lake Superior
Digital Media-Group 2	Green Room
Education	Tower
Health, Food, & Wellness	Parlor A
Humanities & Performing Arts-Group 2	Lake Huron
Social Science-Group 2	Lake Erie

Room locations and presentation times are subject to change. Please check the registration area for the most accurate program information.

Abstracts

Abstracts are listed alphabetically by the coordinating presenter's last name.

A REVISION OF AN ERRONEOUS AND INAPPROPRIATE IDENTIFICATION OF EARLY BRONZE AGE AEGEAN FRYING PANS
Tamar Aldrich
Location: Lake Huron Room, 3:00 PM
Category: Humanities and Peforming Arts-Section 2, Oral
Mentor(s): Jon Frey (Classics/Art History)
Whether you consider yourself devoutly religious or not, most likely you have heard the expression "Cleanliness is next to Godliness."It is my intent to reveal some of the beliefs of the ancient Aegean population may not have been that different from our beliefs today. The research for this project pertains to the objects so named "Frying pans." I will explain why these objects were most likely primarily used by women just not in the kitchen. The images on the front surface are a clue to their purpose and function. Questions I plan to explore include but are not limited to: What was their function? Did they have a religious significance? Where they for public ritual purposes or more intimate purpose? What does the decoration tell us about the culture? The implication of their name implies that they were used in a culinary context. I intend to disprove this theory in an archeological/anthropological test. Once this is accomplished I intend to offer a purpose and function for the so called "Frying pans". Then offer a new name for them that is more in line with their role in the early Bronze Age Aegean world.

DEMOCRACY AND GENDER IN KUWAIT: SEATS, BALLOTS, TICKETS AND PERMS
Mohammed Al-Kabour
Location: Lake Erie Room, 9:30 AM
Category: Social Science: General-Section 1, Oral
Mentor(s): Rita Kiki Edozie (International Relations)
This is a study of Kuwait's democratization and the importance of gender and citizenship pertaining to democratization. Samuel Huntington, Faread Zakaria, Arend Lijphart, Marcin Krol, and Seymour Lipset make up the majority of literature concerning democratization and citizenship, while other scholars make up the balk of the study of gender and Kuwait. I explore how much has changed for Kuwaiti women's citizenship and how this reflects democratization. In addition, I posit that T. H. Marshall's theory on citizenship rights is not the way that women in Kuwait attain their citizenship rights. Rather, women in Kuwait gain citizenship in a way reflective of Kuwait's milieu. I conclude with emphasis on greater study of gender and citizenship as they relate to democratization for wider and deeper understandings of democratization and democracy.

EVALUATING MICHIGAN STATE'S STEWARDSHIP: A LOOK AT MORRILL HALL
Jennifer Allen
Location: Lake Erie Room, 11:15 AM
Category: Social Science: General-Section 1, Oral
Mentor(s): Lynne Goldstein (Anthropology)
As an intern with the Campus Archaeology Program, I was asked to research Morrill Hall, one of the oldest buildings still standing on the MSU campus. It is one of Michigan State University's most culturally and historically rich buildings but the University has plans to demolish the structure. I used the MSU archives to research Morrill Hall's past as well as investigate the reasons for its proposed demolition by collecting and synthesizing all the available information. It was my objective to obtain a full understanding of Morrill Hall's cultural and historic significance as well as understand the circumstances of Morrill Hall's demolition, replacement, and future treatment of the site. I also spoke directly with the director of Campus Parks and Planning at MSU, Jeff Kacos, about the university's plans concerning Morrill Hall. Morrill Hall, once called the Women's Building, is significant not only to MSU's past but also to the history of women's higher education in the United States. When it was no longer a women's building, it became Morrill Hall representing MSU's connection to the land grant heritage of U.S. higher education. The building's significance requires consideration of alternatives to demolition such as adaptive reuse and LEED certification. By adapting and preserving Morrill Hall, MSU would not just preserve the immense cultural and historic significance of the building, but would demonstrate its leadership in sustainability and stewardship.

THE SECURITY INDUSTRY- POST SEPTEMBER 11TH
Megan Almendinger
Location: Gold Room, 1:30 PM - 3:30 PM
Category: Social Science: General-Section 3, Poster
Mentor(s): Mahesh Nalla (Criminal Justice)
Since 9/11, the security industry has become more important than ever to the protection of the nation. With this renewed importance should come increased licensing standards of security guards. Prior to September 11th, the licensing standards were minimal at best. I expect to find that this has not changed.

FROM LEARNED HELPLESSNESS TO LEARNED RESILIENCY: HOW FAMILIES AND EDUCATION SYSTEMS SHAPE THE ACADEMIC SUCCESS OF AFRICAN-AMERICAN STUDENTS

Effie Alofoje-Carr

Location: Tower Room, 2:00 PM

Category: Education, Oral

Mentor(s): Sigrid Julian Dixon (Counseling), Lee June (Student Affairs and Services)

Resilience is the ability to recover from and adjust to change or adversity. Resilience has been an avidly researched topic in youth and adult development. Historically, the attributes that comprise resiliency which result in completion of education in African Americans are often overlooked. I will study how K-12 programming and increased, consistent family involvement foster resiliency in black students. Programs such as the Detroit Area Pre-College Engineering Program prepare inner city youth for rigorous academic majors. Girl Scouts offers Brain STEM (Science, Technology, Engineering and Math) which encourages young ladies to learn more about subjects that are historically male-dominated. Healthy family relationships and academic involvement can stimulate confidence and discipline. I will review the limited existing material on African-American resiliency patterns as well as lived experiences of members of the African-American community who completed their education, or attempted to and could not for a variety of reasons. Finding out what factors are commonly implemented in childhood and youth development that create the ability to effectively conquer academic trials can help increase success rates at all educational levels. My hope is to uncover concrete conclusions about the development of resilience traits in thriving African-Americans who graduated in order to expound upon methods utilized in schools and families to generate successful black students.

A DEEPER LOOK AT THE ANATOMY OF THE HUMAN TOOTH

Kayla Ambroziak

Location: Ballroom, 9:30 AM - 11:30 AM

Category: Physical Sciences, Poster

Mentor(s): Carl Boehlert (Chemical Engineering and Materials Science)

Environmental scanning electron microscopy was used to look at extracted human teeth to learn more about the morphology of teeth and their structure. The composition of the teeth was observed to better understand how these factors affect teeth and allow for their everyday usage. Observing teeth and the material of which they are composed, can provide a better understanding of their functions, aside from being used to chew food. Examining the geography of a tooth can aid in the explanation of its utility. A tooth is composed of non-conductive material. Using a scanning electron microscope would require the sample to be coated. However, the environmental scanning electron scanning microscope was used because it allows for the samples to be looked at in their natural form, without any preparation or need for a coating. It uses an electron beam and electromagnetic lens to examine a specimen. This allowed for better imaging.

IDENTIFICATION OF RESIDUES ESSENTIAL FOR ABASIC SITE-SPECIFIC DNA LYASE ACTIVITY OF HUMAN ABH1

Megan Andrzejak

Location: Gold Room, 1:30 PM - 3:30 PM

Category: Biochemistry and Molecular Biology-Section 2, Poster

Mentor(s): Robert Hausinger (Biochemistry and Molecular Biology), Tina Mueller (Biochemistry and Molecular Biology)

Humans possess eight homologues, known as ABH1-ABH8, of the Escherichia coli DNA repair enzyme AlkB that catalyzes the oxidative demethylation of alkylated DNA and RNA. In addition to its demethylation activity, ABH1, closest in sequence to AlkB, also catalyzes the unanticipated cleavage of DNA at abasic sites (AP) according to a B-elimination mechanism. The goal of the experiments described here was to identify residues of the protein that are responsible for this lyase activity. This class of enzyme typically uses a lysine side chain to catalyze the reaction, so all 22 lysines were mutated by site-directed mutagenesis. The variant forms of ABH1 were over-expressed in E. coli BL21(DE3) cells, cell-free extracts were obtained, and the His-tagged proteins were purified by using a Ni-NTA Sepharose column. AP-lyase activity assays demonstrated that all of the purified proteins retained the ability to cleave AP-containing DNA, providing no significant insight as to which lysine is responsible for the DNA-cleaving activity. This result indicates that ABH1 possesses an “opportunistic lysine” which takes over once the original lysine has been mutated as has been seen in certain other AP-lyases. An additional approach to identify the region containing the critical lysine involved construction of N- and C-terminally truncated proteins in maltose binding protein fusion variants. The mutants were enriched with an amylose resin; however, again, all truncation variants were active indicating that the two lysines responsible for the DNA-cleavage are not located in the same region of the protein.

THE USE OF TACHI BY JAPANESE BLOGGERS: A STUDY OF SOCIOLINGUISTIC VARIATION

Marie Arao

Location: Ballroom, 1:30 PM - 3:30 PM

Category: Humanities and Peforming Arts, Poster

Mentor(s): Cristina Schmitt (Linguistics)

This study is a sociolinguistic analysis of the use of the plural morpheme '-tachi' in Japanese blogs. We examine the use of '-tachi' both in terms of syntactic and sociolinguistic factors. -tachi is a morpheme that is used to optionally indicate plurality. Unlike English plural, it is traditionally described as used only with human nouns and subject to very restricted discourse conditions. '-tachi' is mainly used to disambiguate noun phrases, since bare nouns in Japanese can be interpreted as plural or singular. Linguists and educationists argue that there is a recent trend between younger speakers of Japanese to use '-tachi' more freely than older speakers. The claim is that '-tachi' is used nowadays not only with human nouns but also with other animate and inanimate nouns. We provide a quantitative analysis of the use of '-tachi' in 3 age groups in order to determine whether or not '-tachi' is, in fact, used more by younger speakers and whether there are further conditions regulating its distribution such as syntactic position, presence/absence of a case marker, etc.

THE ROLE OF YDBR IN BACILLUS SUBTILIS
Courtney Attard
Location: Gold Room, 1:30 PM - 3:30 PM
Category: Cell Biology, Genetics, and Genomics-Section 3, Poster
Mentor(s): Robert Britton (Department of Microbiology and Molecular Genetics)
We are investigating the role of the gene *ydbR*, which encodes an RNA helicase, in the organism *Bacillus subtilis*. To learn more about the function of *ydbR*, we mutated the gene of interest by insertional integration of a plasmid into the *ydbR* gene. Growth rates were monitored and it was found that the Δ*ydbR* mutant had a reduced growth rate at 37˚C, but showed no phenotype at 42˚C. This is consistent with previously published reports. While the doubling time of the wild-type *B. subtilis* is around 25 minutes, the mutant at 37˚C had a doubling time of 51 minutes. Using DNA microarrays, we have generated gene expression profiles comparing the Δ*ydbR* mutant and wild-type cells at 37°C. Analysis of differentially expressed genes is ongoing and will be discussed in relation to potential function(s) of YdbR.

PAY DEDUCTIONS FOR INEFFICIENT LEGISLATORS
Blake Baca
Location: Gold Room, 9:30 AM - 11:30 AM
Category: Social Science: General-Section 1, Poster
Mentor(s): Matt Grossmann (Political Science)
My project is going to be based on a topic that I have researched multiple times this year: proposals to cut legislators pay if they do not accomplish their policy goals. When I was first assigned to research this area in political reform, I took a great interest in it. I began to research it back in October 2009, and published an article about it on michiganpolicy.com. Every aspect of the proposal fascinated me. I was glad to read that State Senator Gretchen Whitmer is pushing to minimize the inefficiency of state legislators by having their pay deducted for not accomplishing their goals. My stand on the entire issue was that if almost every other profession gets penalized for incompetent work, then I believe legislators should follow that rule also. There are many parts of the proposals that I want to further investigate. I would like to find out who is going to be the judge of whether or not a legislator's goal was officially accomplished. I would also like to look into the likelihood of such a proposal being passed in the future. There are many other parts that I would share to the public through this presentation.

STONE USE OVER TIME
Scott Bandkau
Location: Ballroom, 1:30 PM - 3:30 PM
Category: Humanities and Peforming Arts, Poster
Mentor(s): Michael Velbel (Geological Sciences)
The goal of this research is to provide updated and accurate information about the buildings of Michigan State's campus that the stone list does not provide. For example, information was collected about the stone used for the buildings that make up Michigan State's campus. Next, the same types of stone were grouped together to show which occur most frequently throughout Michigan State's campus. Using the type of stone and years the buildings were built, the buildings were divided into the decades they were built to examine trends in stone by decade. For example, brick with Indiana Limestone was by far the most popular choice until the 1970's, when its use greatly diminished. After the 1970's, fewer buildings were built, but either all brick, or brick with metal siding became popular material choices. Additional research was done to find the years in which additions to the buildings were built. The 1990's and 2000's were the most popular years for additions to be built.

VIDI, FHCRC
Lindsey Banks
Location: Ballroom, 9:30 AM - 11:30 AM
Category: Microbiology, Immunology, and Infectious Disease-Section 1, Poster
Mentor(s): Keith Jerome (Virology)
Homing endonucleases (HE) are selfish genetic elements that recognize DNA sequences (14-40bp) and induce double strand breaks. In mammalian cells double strand breaks are repaired via two mechanisms: some homologous recombination but mostly non-homologous end joining (NHEJ). The latter process does not require a repair template and is error prone so introduces mutations at the target sites. It is hypothesized that by engineering HEs to recognize episomal or integrated viral DNA, double strand breaks would be introduced into the viral sequences and subsequent mutations would destroy the ability of the virus to continue pathogenesis. This may prove to be a useful therapy for latent HSV and HIV infections. To explore this concept cells were infected with a lenti virus that carries a GFP reporter combined with a recognition sequence for the HE Y2-AniI, creating a target in a latent viral genome. Cells were infected a second time with a different lenti virus expressing a functional Y2-AniI. After culture of the infected cells the target reporter sequences were PCR-amplified from genomic DNA and cloned. They were then subjected to in vitro digestion with purified Y2-AniI and DNA sequencing to study the consequences of double strand break repair. Mutations were discovered at the recognition site that prevented Y2-AniI from cutting the target sequence in vitro. Sequence analysis revealed deletions ranging from 1-44bp as well as insertions of 1-2bp. This is consistent with the error prone nature of NHEJ and support the concept of using engineered HEs to control latent viral infections.

THE GREEN POINT DILEMMA: UNDERLING ISSUES BEHIND CAPE TOWN'S WORLD CUP VENUE
Brian Bartle
Location: Tower Room, 10:15 AM
Category: History, Political Science, and Economics, Oral
Mentor(s): Rita Kiki Edozie (International Relations)
After spending time in Cape Town this past summer on an internship, I became aware of the local discontent behind Cape Town's World Cup venue selection. In order to explain the dilemma behind the selection of Green Point Stadium as Cape Town's World Cup venue more clearly I organized the competing factors into a tri-leveled paradigm. One level consists of the role FIFA played especially through their monopolized role in international football and their ability to coordinate international pressures on host countries. The second level is the pressure of the global

competition between cities on the "global catwalk" to attract foreign investment. My understanding of this was furthered through help from Professor Peter Alegi on Cape Town and the role of mega-sporting events. Finally, the third level of the paradigm are the effects of the political and social economic tension that has created divides in South Africa and how that translates into South Africa's sporting culture and the resulting political and social economic motives behind the Green Point Stadium. I specifically focus on the Apartheid legacy of the sporting culture in Cape Town and on the political tension between the African National Congress and the Democratic Alliance of the Western Cape Province. I conclude, with guidance from Professor Peter Alegi and Professor Rita Kiki Edozie, that the decision behind Cape Town's World Cup venue was short sighted and was the result of multi-leveled competition between international, national, provincial, municipal, cultural and local forces and interest groups.

PHYLOGENETIC ANALYSIS OF MORPHOTYPES IN THE GENUS CANTUA
Nicholas Batora
Location: Gold Room, 1:30 PM - 3:30 PM
Category: Cell Biology, Genetics, and Genomics-Section 3, Poster
Mentor(s): Alan Prather (Department of Plant Biology)
Cantua pyriolia is currently recognized as a species in the plant family Polemoniaceae. This species shows considerable morphological diversity. Specifically, there are four examples of unique morphotypes with distinct geographic ranges. Traits that distinguish the morphotypes include glandular trichomes, elongated calyxes, reduced corolla tubes and modified filament attachment. These morphological characters are not enough to support species status for these morphotypes However, phlyogenetic data in combination with morphological distinctiveness can support recognizing these morphotypes as species. If all of these populations were a single species then the expectation would be that there is no phylogenetic cohesion among the morphotypes because of gene flow among populations. Conversely, if the morphotypes are resolved as monophyletic units, then that would support the hypothesis that there is no gene flow among populations and that additional species can be recognized among the populations that have been treated as a single species. We estimate that C. pyriolia is actually made up of four separate species that recently diverged. I used the primers designed to amplify chromosomal internal transcribed spacer (ITS) regions along with the three chloroplast gene regions to detect phylogenetic signal to support the recognition of the morphotypes as individual species.

THE HPV AND RUBELLA VACCINE IN MALES: THE NARRATIVE FALLS APART
Zachary Bauer, Cecilee Jarrad
Location: Parlor A, 1:30 PM
Category: Health, Food, and Wellness, Oral
Mentor(s): Mark Largent (History)
It's the first step to the treatment of cancer: the HPV vaccine can prevent certain types of cancer from forming in a woman's body. The only question is why isn't this groundbreaking vaccine being given to men also? To simplify the reasons into one statement: it is not effective for males. In the early 1960's an epidemic swept the United States presenting a situation very similar to HPV's scenario. Rubella's vaccine gave almost no benefit to the people who received it. Instead, the vaccine protected unborn children from birth defects sometimes caused when pregnant mothers contracted the disease. Rubella caused countless numbers of miscarriages, still births, and birth defects. Is the case of Rubella an analogy that would help justify requiring males to get the HPV vaccine? If the HPV vaccine was given to men, then it could prevent women and children from getting this disease, just as giving the Rubella vaccine to males. Does this justify giving males the vaccine? Does this Rubella scenario actually apply? If a man can prevent his fellow citizens from getting a vaccine shouldn't he be obligated to do so? Ultimately we conclude that the HPV vaccine is a valid choice to defend females from HPV, but it doesn't give the same benefits to males or unborn children. Rubella seems to present an analogy to give males the vaccine but, upon further exploration the case falls apart. The situation is similar but the diseases are not. Males should not receive the HPV vaccine.

CAL FIRST-YEAR COHORT: CRITICAL QUESTIONS
Jeanette Bay, Anne Fazzini, Kailey Shelton, Jennie Withers
Location: Ballroom, 1:30 PM - 3:30 PM
Category: Humanities and Peforming Arts, Poster
Mentor(s): Janet Swenson (Assoc. Dean of Academic Affairs)
CAL First-Year Cohort: Critical Questions" This research study seeks to better define attributes of the College of Arts and Letters first-year cohort that will enable faculty and staff to interact with them more effective. The study began with faculty and staff interviews aimed at discerning the critical questions whose responses could beneficially inform faculty and staff initiatives. The next step was to translate those critical questions into a student survey, administer the survey, and analyze the results.

FAVELA TOURISM: AUTHENTICITY IN CROSS-CULTURAL ENCOUNTERS?
LeighAnna Beach
Location: Tower Room, 10:45 AM
Category: History, Political Science, and Economics, Oral
Mentor(s): Colleen Tremonte (James Madison College)
Slum tourism stands at the center of several overlapping controversies, including globalization and imperialism, the impact of "the tourist gaze," development strategies and poverty eradication. It has been condemned as unethical, voyeuristic, commodifying poverty, but also promoted as a method of spreading awareness and "humanizing" global poverty and bringing income to the slums. In Rio de Janeiro, an estimated 600 favelas house around 1.2 million inhabitants. Built by the city's poorest residents, without government oversight or assistance, they vary greatly in size, level of services and violence. Today, the chance to experience "authentic poverty and life in Rio," as well as the incredible views from the hills, appeal to an increasing influx of Western tourists. An examination of several touring companies shows the presence of conflicting incomplete imaginings of Rio's favelas, raising questions of whose imaginings are marketed to tourists, and what impact the slum tours have on both the tourist and their object, the slums. My analysis in the paper is informed by two main questions: How are poverty, slums and their inhabitants characterized or viewed within the discourse of favela tourism in Rio de Janeiro, including the tours

themselves, captured video and commentary, and critiques? And what are the effects on the viewers and the viewed? To explore these questions I will examine Rio favela tour companies and footage from several sources, including tourist-generated YouTube clips, journalistic and scholarly sources.

FABRICATION OF NERVE GUIDANCE SCAFFOLDSFOR SPINAL CORD REPAIR
Bridget Bednark
Location: Gold Room, 1:30 PM - 3:30 PM
Category: Engineering, Computer Sci, and Math-Section 2, Poster
Mentor(s): Jeff Sakamoto (Chemical Engineering and Materials Science)
Spinal cord injury causes life-altering damage through loss of motor and sensory function due to the lack of nerve regeneration after SCI. In order to improve the quality of life for those suffering with spinal cord injuries, the incorporation of agarose nerve guidance scaffolds to guide axonal growth was investigated. Central and peripheral nervous system scaffolds were fabricated using fiber optic bundle templates consisting of polystyrene fibers and polymethyl methacrylate cores that were cast in molten agarose after a series of polymer etching. Central nervous system scaffolds were designed for the C3 dorsal column lesion and complete thoracic transections. Using the nerve guidance scaffolds with combined therapies to stimulate axonal growth, the central and peripheral nervous system scaffolds were found to have an optimum dimension of 1.5x1.5x2.0 mm and 1.3x1.3x15 mm, respectively, at 3 weight percent agarose when implanted into the spinal cord of adult rats. Nerve regeneration was apparent 1.5 mm beyond the lesion site and cell reactive layer for the C3 dorsal column model four weeks after treatment. Further research is being conducted in a continuing effort to eliminate the cell reactive layer to promote axonal egress throughout the lesion site as well as investigating ways in which the mechanical properties of agarose can be optimized for biomedical applications. The combination of these elements will help gain more insight into SCI and support the goal of scaling this model to clinical relevance for humans in the future.

WHAT IS DEATH: PUBLIC CONCEPTION OF WHOLE-BRAIN DEATH
Nicholas Bellono
Location: Lake Erie Room, 2:30 PM
Category: Social Science: General-Section 2, Oral
Mentor(s): Ann Mongoven (Center for Ethics and the Humanities in the Life Sciences)
The aim of this study is to explore conceptions of death and to probe public understanding of the “whole-brain” definition of death. Although there may be diverse levels of understanding or acceptance of that definition amongst the population, whole-brain death remains a legal standard of death in the U.S. While there has been a strong policy consensus on the whole-brain standard of death for a generation, that consensus is increasingly questioned among neurologists, bioethicists, and hospital personnel. In order to enhance ethical discussions about defining death with empirical data, we developed a survey administered to various population groups. The survey asks respondents to assess several cases before and after an educational module.Our survey seeks to answer the following questions: Do participants intuitively consider a person meeting whole-brain death criteria to be dead? Can they distinguish whole-brain death from “higher” brain death, or permanent vegetative state? What criteria do they think are important for determining death and from what influences do those criteria derive? Do they think there should be a uniform definition of death for public policy purposes? Our results show prevalent misunderstanding of legal standards of death in the U.S. and of the difference between higher and whole brain death. This indicates that further public education on these standards is required. After the education module of the survey, a majority of respondents report comfort with the whole-brain definition of death, while a significant minority does not. There is disagreement about whether a uniform definition of death is desirable.

IDENTIFICATION OF A LIPID BINDING PROTEIN IN THE PHLOEM AND ITS ROLE IN PLANT DEVELOPMENT AND STRESS RESPONSE
Urs Benning
Location: Gold Room, 1:30 PM - 3:30 PM
Category: Biochemistry and Molecular Biology-Section 2, Poster
Mentor(s): Susanne Hoffmann-Benning (Biochemistry and Molecular Biology)
The role of the phloem has changed from that of simple assimilate transport to a trafficking system for pathogen response and developmental regulators. We have obtained enriched phloem exudates from Arabidopsis thaliana and characterized proteins, metabolites and mRNAs. We discovered several fatty acids, lipids and lipid-binding proteins in the phloem. These phloem lipids are not artifacts from membranes but intrinsic to phloem exudates. As the phloem is an aqueous environment, the lipids may be bound to proteins to increase solubility. This is not without precedence in biological systems: human blood contains a variety of lipids. They are bound to proteins and transported to other tissues for use, storage, modification, or degradation (e.g. vitamins, cholesterol), or serve as messengers and have transcription factor activity. It raises the possibility that lipids and the respective lipid-binding proteins in the phloem serve similar functions in plants. One phloem lipid-binding protein, the lipid-associated family protein (LAFP) contains a PLAT/LH2 domain. This domain is proposed to mediate interaction with lipids or membrane-bound proteins. Proteins containing the domain are typically induced in response to stress. We showed its ER/secretory pathway associated localization using YFP labeling. LAFP knock-out mutants have a low germination rate, delayed development of young leaves, and reduced seed set leading to a lower survival rate compared to wild-type plants. We will present the effect of LAFP on development, ultrastructure, phloem lipid- and metabolite profiles as well as its localization and lipid-binding properties.

MONKEY AND ITS MUSIC SWING ACROSS THE GLOBE
Taylor Benson
Location: Lake Erie Room, 10:30 AM
Category: Social Science: General-Section 1, Oral
Mentor(s): Catherine Ryu (Linguistics)
This project analyzes “Saiyuki” or “Monkey” as it was known in the U.K. --a popular television show and multimedia representation of the Silk Road made in the 1970s. In particular, I will analyze the Japanese band Godiego’s theme song as it relates to one episode of “Saiyuki”. The show is based on the classic Chinese novel Journey to the West by Wu Cheng’en and ran for two seasons. It was filmed in Chinese and then dubbed

in English and broadcast over British Broadcasting Corporation to reach a larger audience. The show is considered a representation of the Silk Road because at the time Godiego's music and "Saiyuki" emerged, Japan was experiencing a "Silk Road cultural boom". Our present perception of the Silk Road is very much tied to the multimedia legacy created by Godiego and "Saiyuki". I intend to not only find out what makes this true, but how we are able to come to this conclusion. This analysis is comprised of three different levels, the visual, the aural, and the combined effect of the two in the overall production. The popular history of the Silk Road media and music is an important reminder that the idea of the Silk Road is culturally constructed and has been circulated around the globe.

FORMULAS FOR SUCCESS: JAPONISME AND THE ART OF MARCEL DZAMA
Eric Booker
Location: Lake Huron Room, 2:15 PM
Category: Humanities and Peforming Arts-Section 2, Oral
Mentor(s): Phylis Floyd (Art and Art History)
Illustration has proven to be a fundamental element within the history of art for centuries. However, more often than not this medium has continually been dismissed as a lesser form of art due to a variety of reasons; its associations with commercialism, democratic accessibility, and the very nature of its transience and immediacy. Ironically, these characteristics have in fact allowed illustration to thrive. Looking at the work of Canadian artist Marcel Dzama as an archetype, we are provided with a glimpse unto a contemporary art movement that has incorporated this style to its very fullest. Yet in order to understand why artists such as Dzama have come to be so influential within contemporary art, a parallel might be drawn to America's cultural fixation with the art of Japan in the nineteenth century, known as Japonisme. Stylistically similar and uniformly successful, Marcel Dzama and nineteenth century Japanese prints share a common formula for success.

CULTIVATION AND ANALYSIS OF BACTERIA THAT DEGRADE PLANT BIOMASS
Ryan Bowman, Timothy Berry, Chad Shirk
Location: Ballroom, 9:30 AM - 11:30 AM
Category: Microbiology, Immunology, and Infectious Disease-Section 2, Poster
Mentor(s): Clive Waldron (Microbiology and Molecular Genetics)
The cost-limiting step in biofuel production from plant biomass is the breakdown of cell wall polymers to fermentable sugars. Non-traditional culturing strategies were used to cultivate novel soil bacteria for possible use in more efficient bioconversion. Soil bacteria were isolated from deciduous forest and corn plots at the Kellogg Biological Station. A dispersion buffer was used to separate bacteria from the soil. One key feature of the cultivation was incubation in low (2%) oxygen and high (5%) carbon dioxide conditions that mimic the atmosphere in the soil. A second notable feature was the use of bi-layer agarose plates containing plant polymers (AFEX-treated Corn Stover or Poplar Chips) as the sole carbon source. These bi-layer agarose plates were necessary to keep the bacteria in close contact with the plant polymers. The two soil sources and two plant polymers were used together to make four unique cultivations, each yielding unique results. Several isolates were purified and characterized by growth experiments including O2 tolerance, the ability to use large or small plant biomass particles, and the ability to utilize different plant biomass components (hemicellulose, cellulose, and lignin). The influence of soil source and the carbon source used for enrichment will be discussed. Candidates worthy of further study will be identified.

RUNNING THE RACE TO THE TOP
Kari Boyd
Location: Gold Room, 9:30 AM - 11:30 AM
Category: Education-Section 1, Poster
Mentor(s): Matt Grossmann (Political Science)
For this project I am researching the changes in K-12 education policy (or lack thereof) undertaken by Michigan in pursuit of "The Race to the Top". After a brief analysis of the requirements a state must meet in order to qualify, I will compare actions taken by Michigan to other states that showed interest in "The Race to the Top" throughout the application process and why certain states dropped out of the "race" when they did. I want to discover the changes in the availability of alternate education and new methods of improving teacher performance i.e., charter schools, merit pay, alternate teacher certification that have resulted from "The Race to the Top". I will explore the hindrances faced within the Michigan legislature for proponents of reform and compare them to the hindrances faced in other states. The impact made by groups both opposed to and in favor of the reforms will be analyzed, mainly the impact of teachers unions. I hope to explore the connection between the economic standing of the state and the state's willingness to pass reforms. These factors will help us understand why certain states, like Michigan, chose to pass these reforms and other states chose not to compete for their portion of 4.3 billion dollars. I found that in most cases the deciding factor was the legislature's desire to obtain funds for education outweighed the loss of certain discretionary powers to the federal government.

CHILDREN'S 3D ROTATION SKILLS AND VIDEO GAME ENJOYMENT
Leah Brand
Location: Ballroom, 9:30 AM - 11:30 AM
Category: Communication Arts and Sciences, Poster
Mentor(s): John Sherry (Communication)
Video games are a common pastime for children all over the world. However, not every child likes to play the same games, and some do not choose to engage any at all. Sherry (2004) has theorized that individuals may avoid playing games that require cognitive skills that the individual is deficient in. A series of studies with undergraduate students have confirmed this hypothesis (Bowman & Sherry, 2006; Sherry, Rosaen, Bowman, & Huh, 2006). This study was conducted to determine whether Sherry's findings generalize to children.

MIDWEST URBAN POLICY: AN ECONOMIC COMPARISON
Corey Brown
Location: Ballroom, 1:30 PM - 3:30 PM
Category: History, Political Science, and Economics, Poster
Mentor(s): Matt Grossman (Politcal Science)
I will be presenting a comparison between the economic states of major Midwest cities, such as Detroit, Cleveland, and Chicago, and search to find any relation between their economies and the urban policies put in place at the state level. The purpose of this would be to see if one state's public policy in the area of urban affairs is more effective than anothers', and if so propose a plan to states with major cities who's economies are failing. The over-arching idea behind this project is that the economies of our major cities has a large impact on the economies of our states and nation, and that state legislature and policy has a large hand to play in this.

CUSHING'S SYNDROME DOWN-REGULATES GLUCOSE TRANSPORTER MRNA ABUNDANCE IN THE DISTAL JEJUNUM IN THE HORSE
Alexandra Buckley
Location: Parlor A, 11:15 AM
Category: Agriculture and Animal Science, Oral
Mentor(s): Nathalie Trottier (Animal Science)
Cushing's Syndrome is commonly associated with laminitis in horses. High levels of glucocorticoids are known to induce insulin resistance and reduce cellular glucose uptake, however, the mechanisms are unknown. Decreased capability for pre-cecal glucose absorption may increase carbohydrates flow to the large intestine in Cushing afflicted-horses, altering the hindgut microflora and increasing susceptibility to laminitis. The objective was to test the hypothesis that horses affected by Cushing have lower mRNA abundance of genes encoding for glucose transporters and insulin receptor in the jejunum enterocytes, compared to healthy animals. Tissue from the distal jejunum was obtained from 8 adult horses (4 affected with Cushing's Syndrome and 4 healthy controls) shortly following euthanasia. The mucosa was separated from the sero-muscular layer for RNA isolation. Gene expression of glucose transporters GLUT1, GLUT2, GLUT4, GLUT5, SGLT1 and insulin receptor (INSR) was assessed by measuring mRNA abundance using real-time Q-PCR. Succinate dehydrogenase complex (SDHA) and hypoxanthine phosphoribosyltransferase (HPRT) were used as reference genes. Mixed model was used for data analysis. Compared to healthy control horses, mRNA abundance of insulin receptor and insulin-dependent glucose transporter GLUT4 decreased ($P < 0.01$) in the distal jejunum of Cushing's horses. For GLUT1, GLUT2, GLUT5 and SGLT1, mRNA abundance did not differ between Cushing and control horses. Results indicate that Cushing's syndrome down-regulates the gene expressions of insulin-dependent glucose transporter GLUT4 and insulin receptor in the distal jejunum of the horse. These results may offer a physiological mechanism for increased susceptibility to nutritionally induced laminitis in Cushing-afflicted horses.

TYPE 1 DIABETIC FEET BONE COMPLICATIONS
Cassandra Bunker
Location: Gold Room, 9:30 AM - 11:30 AM
Category: Cell Biology, Genetics, and Genomics-Section 2, Poster
Mentor(s): Laura McCabe (Physiology)
Type 1 diabetes, also known as diabetes mellitus, is a condition where the body's pancreatic organ is incapable of producing the hormone insulin. Although the disease is most commonly found in youth, it can develop at any age. Diabetics with the type 1 condition can develop a number of complications due to a prolonged period of hyperglycemia. Complications include heart disease, nephropathy, osteoporosis, and neuropathy. Specifically, peripheral neuropathy is damage to the nerves and is found most commonly in the legs and feet. In diabetics, this impediment is caused by high blood sugars and decreased blood flow to the limbs. Symptoms in the feet include numbness, tingling, sensitivity, ulcers, deformity, and bone pain. It is hypothesized that the deformities and bone pain may be related to the loss of bone mineral density that is another side effect of long term high blood glucose levels. Our lab has shown that bone formation is decreased in type 1 diabetic mouse models which leads to bone loss. Osteoporosis has been documented in tibia, femur, vertebrae, and skull. However, nothing is known about foot bone parameters. My project examines trabecular and cortical bone densities and volume measures in control and type 1 diabetic mice feet. I am also looking at foot cross sections to assess the number of bone forming cells in this area. Understanding how type 1 diabetes influences bone density in feet can prevent/treat potentially debilitating fractures that may be a complication of the disease.

INTEGRATING PORK PRODUCTION WITH ORGANIC CROP PRODUCTION
Allison Bunting
Location: Ballroom, 1:30 PM - 3:30 PM
Category: Agriculture and Animal Science, Poster
Mentor(s): Laurie Thorp (RISE)
A pilot study with the goal of integrating pork production with organic vegetable production was conducted at the MSU Student Organic Farm (MSU SOF). Five crossbred barrows were raised to 240 lb. live weight in a modified, open front facility. In mid-September the pigs were transported to the MSU SOF and placed in a 150 x 75 ft post-harvest brassica plot. At d 29, the pigs were moved to an 80 x 54 ft post-harvest squash field. Throughout the study, the pigs were supplemented with a corn-soybean meal diet. On d 43 of the study, the pigs were taken to harvest. All pork was sold at $4.25/lb. Pigs gained an average of 58.8 lb. (approximately 1.37 lb. average daily gain). There was no evidence of internal parasites at harvest. An estimated 850 lb. (wet weight) of plant material was consumed per pig. After pigs were removed and fall tillage of the plots occurred, compaction of soil was observed. The effects of this compaction on soil structure and nutrient deposits of phosphorous, nitrogen, and ammonia thru waste will be studied in the 2010 growing season. Future studies are planned to better understand plot size needed, amount of supplemental feed needed, input budgeting, and ultimate profitability of post-harvest organic garden grazing systems.

A CASE STUDY OF LETTER-COLOR SYNESTHESIA
Krista Bur
Location: Ballroom, 9:30 AM - 11:30 AM
Category: Psychology-Section 2, Poster
Mentor(s): Devin McAuley (Psychology)
Synesthesia is a rare condition in which stimulation in one sensory modality elicits a sensory experience in another separate modality. In the current study, we examined the reliability and automaticity of the synesthetic experience of KB, a female with grapheme-color (letter-color) synesthesia. To assess reliability, we asked KB to rate the strength of her color experience in response to each letter at two time points. The strength of KB's color experience was remarkably consistent across testing times, r = 0.94. The automaticity of KB's synesthesia was tested using a modified Stroop task in which KB and a sample of non-synesthete controls named the color in which letters were printed; congruent and incongruent pairings of letters and colors were based on KB's self-reported color-letter associations. KB showed a large incongruency effect that was not present in the control participants. Future research will probe the perceptual nature of KB's synesthetic color experience using functional magnetic resonance imaging.

EFFICIENT USE OF WATER COOLERS
Kyle Burke, Angela Marchand
Location: Ballroom, 9:30 AM - 11:30 AM
Category: Environmental and Natural Resources-Section 1, Poster
Mentor(s): Steven Safferman (Biosystems and Agricultural Engineering)
Our project consists of creating energy savings campus wide by reducing the number of hours that water coolers are on. By installing timers on the water coolers, hours of operations may be limited to during the day and reduce energy consumption by not being on at night. Substantial testing of the amount of energy used and the number of fountains in buildings has produced the data needed to find the savings made possible by installing timers. Through cost benefit analysis a decision will be made whether or not to implement this project campus wide.

GREAT LAKES ATTACHMENT AND MICHIGAN'S GROWTH IN THE NEW ECONOMY
Katelyn Burns
Location: Parlor C, 10:15 AM
Category: Environmental and Natural Resources, Oral
Mentor(s): Shari Dann (Community, Ag, Recreation And Res Studies)
A major issue in Michigan is attracting young, talented adults to choose to live in the state after they graduate. Place and prosperity studies have shown that in the New Economy, well-educated people choose the location in which they desire to live prior to looking for a job. As a result, in order to compete in the New Economy, Michigan must attract people based on its location. Some of the features that exclusively define Michigan are its distinct natural resources. The Great Lakes create a diverse environment which is unique to this region. Drawing on these qualities, Michigan can create a desired location which is dependent on its particular environment. In this research, campers ages 12 to 15 from the Michigan 4-H Great Lakes & Natural Resources Camp were studied. Based on survey data collected over 10 years from 478 campers, I plan to analyze place variables to investigate whether the camp creates an affinity for the Great Lakes, how Great Lakes place attachment affects campers' intended career choice, and whether campers with a strong attachment to the Great Lakes develop life skills. I plan to break each of these questions down into a bivariate analysis to see how different sets of campers compare. Based on these analyses, I plan to draw a connection between creation of a Great Lakes affinity and Michigan's attractiveness to young people, thus helping to contribute to the state's possible growth in the New Economy.

MAPPING OF TWO GENES INFLUENCING TIMING OF FLOWERING IN ARABIDOPSIS THALIANA
Meagan Burns, Kim Arnold
Location: Gold Room, 1:30 PM - 3:30 PM
Category: Cell Biology, Genetics, and Genomics-Section 3, Poster
Mentor(s): Steven Van Nocker (Horticulture)
Many plants acquire the ability to flower after an extended cold period, a phenomenon known as vernalization. One effect of vernalization in Arabidopsis thaliana is transcriptional silencing of Flowering Locus C (FLC), a flowering repressor gene encoding a MADS-domain transcription factor. We previously identified at least seven genetic loci, termed Vernalization Independence (VIP) required for maintaining FLC transcriptional activity. Recessive mutations at these loci result in plants that flower without cold exposure. The purpose of this study is to determine the chromosomal locations of two of these, VIP1 and VIP8, and to identify the genes. To accomplish this, we are analyzing recombinants in a segregating F2 mapping population using molecular markers. In addition we are determining the general chromosomal location of 15 additional unknown VIP loci through bulked segregant analysis to determine if one or more of these may be allelic with VIP1, or VIP8. Results of this study will be presented.

COLORISM: BLACK WOMEN AND MODERN MENTAL SLAVERY
Lemeia Burrel
Location: Lake Erie Room, 1:00 PM
Category: Social Science: General-Section 2, Oral
Mentor(s): Rita Kiki Edozie (James Madison College)
This piece will investigate both the roots of colorism and its current manifestations, as they impact black women in the United States. I argue that black women are negatively affected psychologically about their physical appearance in terms of skin complexion, facial features, body figure, and hair type, based on natural deviations from European standards of beauty. The self-esteem and psyche of the black woman begins developing during childhood and continues through adulthood. To illustrate this point, I will analyze the Doll Experiment performed in 1954 by pioneering psychologist Kenneth Clark. The results of this study will provide evidence that little black girls have historically been affected

psychologically by colorism at a young age. My research will also explore current manifestations by analyzing more recent studies on colorism and black women, including a more recent replication of the 1954 Doll Experiment.

INFLUENZA GROWTH IN IMMORTALIZED CHICK EMBRYO CELL LINE
Chelsey Burt
Location: Ballroom, 9:30 AM - 11:30 AM
Category: Microbiology, Immunology, and Infectious Disease-Section 1, Poster
Mentor(s): Paul Coussens (Animal Science Department)
Currently, influenza virus vaccines are created through the use of embryonated chicken eggs. The process of making these vaccines can take 6-9 months. The manufacturing method produces a low concentration of virus per egg, and requires significant downstream production for purification. This process also selects for receptor-binding variants causing a reduction in antigenicity. We have demonstrated an immortalized chick embryo cell line, termed PBS-1, and a derivative cell line PBS-12SF (PBS-1 cells that have adapted to growth in serum free conditions), are capable of growing unmodified recent isolates of human and reassortant H5N1 influenza strains to high titers. In many cases, PBS-1 cells and PBS-12SF out perform primary chick embryo kidney (CEK) cells, Madin-Darby Canine Kidney (MDCK) cells and African green monkey kidney cells (Vero) in growth of recent influenza isolates. Both PBS-1 cells and PBS-12SF cells are free of any exogenous agents, are non-tumorigenic, and are readily adaptable to a variety of culture conditions. Influenza viruses grown in these cells are released into the culture fluid without the need for exogenous proteases, creating a more simple downstream processing. In addition to offering a significant improvement in vaccine production, PBS-1 cells and PBS-12SF cells should prove valuable in diagnostics and as a cell line of choice for influenza virus research.

RATES OF INTRAMOLECULAR DIFFUSION IN INTRINSICALLY DISORDERED PROTEINS LEA AND ANHYDRIN
Eric Buscarino
Location: Ballroom, 9:30 AM - 11:30 AM
Category: Physical Sciences, Poster
Mentor(s): Lisa Lapidus (Physics)
Protein folding is an important aspect of many degenerative, aggregation based diseases such as Alzheimer's, Parkinson's disease, and Type II diabetes. By understanding how and when proteins fold or misfold under certain conditions these diseases can be better understood and treated. We have measured the rates of intramolecular diffusion between cysteine and tryptophan in the intrinsically disordered proteins LEA (Late Embryogenesis Abundant) and anhydrin. These proteins have been shown to prevent aggregation in cells during desiccation. These rates depend on the sequence of the polypeptide chain, and we have found very different dynamics for these two sequences, with LEA diffusing intermolecularly much faster than anhydrin.

UGS200H
Shauna Caffrey
Location: Ballroom, 1:30 PM - 3:30 PM
Category: Microbiology, Immunology, and Infectious Disease-Section 3, Poster
Mentor(s): Mark Largent (Science Policy)
UGS200H is an honors seminar class that focused on the relationship between vaccinations and public response. My project focuses survey research conducted regarding the vaccines for seasonal influenza and H1N1 and their public opinion and acceptance.

VISUAL LITERACY DEVELOPMENT IN YOUNG CHILDREN
Sara Calkins
Location: Gold Room, 1:30 PM - 3:30 PM
Category: Education-Section 2, Poster
Mentor(s): Nell Duke (Teacher Education)
This study used a set of tasks to understand the development of visual literacy in students in preschool through third grade. The tasks, administered to sixty children, explored eight visual literacy principles and understandings. Two such principles included the Principle of Extension (the idea that images can provide information that the words do not) and the Principle of Action (the idea that still graphics can represent dynamic action). Through one on one interaction, we as researchers asked the children to explain or show their comprehension of graphics through their words or actions. In my poster, I will outline the study's methods and all eight principles that were focused on, as well as present the results. Results indicate that, similar to children's concepts of print, their concepts of pictures also develop in the early years of schooling, though that development is not complete. This study is a beginning step to a view of whether interpretation of graphics is important to literacy development, and, if so, this can be encouraged in schooling beginning at a young age.

STARCH PHOSPHORYLASE
David Carr
Location: Gold Room, 1:30 PM - 3:30 PM
Category: Biochemistry and Molecular Biology-Section 2, Poster
Mentor(s): Tom Sharkey (Biochemistry and Molecular Biology)
Starch phosphorylase is an enzyme found in plants that functions in the breakdown of starch granules. However, plants lacking this enzyme seem to have normal starch breakdown capacities in regular growth conditions. We hypothesized that the enzyme is used during stressful growing conditions which may not be necessary during growth in a growth chamber. By growing Arabidopsis in various growth conditions, and comparing levels of starch, amino acids, and other metabolites in plants lacking the starch phosphorylase enzyme to wild-type controls, we are attempting to discover a more specialized role of starch phosphorylase in starch breakdown. We have compared plants grown in different photoperiods, as well as in rotating shade to simulate the affect of a cloud passing over.

THE EARLY YEARS: LIFE AT THE STATE AGRICULTURAL COLLEGE
Patricia Cashen
Location: Lake Erie Room, 11:00 AM
Category: Social Science: General-Section 1, Oral
Mentor(s): Lynne Goldstein (Anthropology)
This paper describes the culture and daily life a student could expect while living on campus during the first fifteen years of Michigan State University's operation. Then called the State Agricultural College, or more colloquially the Institution, it was a relatively isolated place of study, work and practical jokes. The students studied into the night, worked to keep up everyday operations, procrastinated and argued. They recognized the importance of learning and broke select rules they chose to ignore. They formed friendships that would last a lifetime and planted the seeds for the University that grew in their footsteps. This culture is seen through the student publications, journals and letters where they recorded their life and where it can be accessed today at the University Archives. The research was inspired by the recent archeological discovery of College Hall and Saint's Rest, the first two buildings on campus, and is designed to further the understanding achieved through these findings and to support the Campus Archeology Program.

PARENTAL INPUT AND LANGUAGE ACQUISITION: DIALECT AND INCOME DEPENDENT DIFFERENCES
Aneite Castaneda
Location: Ballroom, 1:30 PM - 3:30 PM
Category: Psychology-Section 3, Poster
Mentor(s): Cristina Schmitt (Linguistics and Germanic, Slavic, Asian, and African Languages)
In a longitudinal study of the language development of 42 children from families of varying socio-economic status, Hart and Risley (1995) observed differences in vocabulary size depending on SES. The argued that at 30 months the vocabularies of poor children were half the size (M = 357 words) of those of children from professional families (M = 766 words). With age, the differences just grew bigger. They also showed great variability in the size of individual children's vocabulary and the size difference was correlated with the size of the vocabulary used by parents with their children. In this study we use the Miller and Schmitt corpus and we examine the vocabulary sizes of native Spanish speaking children and mothers from two different Spanish speaking countries, Mexico and Chile. We compared the middle class and working class children and their mothers and we hypothesize that there is a clear difference in the children's vocabulary size depending on the size of the vocabulary used by the mothers in speaking to their children. Furthermore, we hypothesize some differences related to class but not dialect. By studying the conversations children and mothers have in natural environments across dialects we can better understand to role of parental input in children's vocabulary sizes.

BACTERIAL PATHOGEN DETECTION USING THERMOPHILIC HELICASE-DEPENDENT AMPLIFICATION (THDA)
Brian Castro
Location: Gold Room, 1:30 PM - 3:30 PM
Category: Engineering, Computer Sci, and Math-Section 2, Poster
Mentor(s): Evangelyn Alocilja (Biosystems and Agricultural Engineering), Edith Torres-Chavolla (Biosystems and Agricultural Engineering)
In the field of molecular diagnostics, the amplification of a small portion of DNA is a necessary step in the detection of bacterial pathogens. The established method of DNA amplification is the polymerase chain reaction (PCR), which utilizes specific oligonucleotide primers and a thermophilic DNA polymerase to selectively amplify a target sequence. A key characteristic of PCR is the cyclic variation of the reaction temperature, which allows DNA strands denaturation, primer annealing, and polymerase amplification. However, temperature manipulation requires a thermocycler, the high cost of which represents a disadvantage for the implementation of new detection platforms in resource limited settings. As an alternative to PCR, isothermal amplification methodologies have been recently developed based on the in vivo mechanisms that cells commonly use to replicate DNA isothermally, so that a thermocycler is not needed. Thermophilic helicase-dependent amplification (tHDA) uses a thermostable DNA helicase to separate double-stranded DNA so that primers and DNA polymerase can bind and extend the new strands at one single temperature. Once two double-stranded helices are synthesized, the process repeats itself, effectively amplifying the target sequence isothermally. In the present study, tHDA protocols were developed and optimized for the detection of bacterial DNA targeting several pathogens of interest to biosecurity and clinical diagnosis. The long-term goal is to replace the PCR step, currently used in most of the DNA-based biosensor platforms developed in the Nano-biosensors Lab, with an isothermal amplification, in order to reduce costs and simplify the application of these technologies in limited resource settings.

POETIC VOICES: POETRY FOR AND BY CHILDREN
Andrew Catterall
Location: Gold Room, 1:30 PM - 3:30 PM
Category: Education-Section 2, Poster
Mentor(s): Laura Apol (Teacher Education), Janine Certo (Teacher Education)
Poetry is more often than not ignored in the curricula of our public school systems. For a variety of historical and experiential reasons, teachers are found to be insecure in their knowledge of poetry. The benefits of poetry education have shown themselves to me through the course of my involvement in three related projects with my mentors, Laura Apol and Janine Certo: a review of the history of poetry for children, a Spencer Foundation-funded study exploring urban pre-adolescents' poetry knowledge and development, and a create compilation of U.S. Poets Laureate poems that could translate to children and adolescents in schools. My involvement in poetry scholarship has informed me of the pressing need for poetry to be included in English language arts and broader curricula. In my presentation, I plan to provide a brief historical timeline for how poetry has been represented for and by children since the 1800s. I will then provide three vignettes of pre-adolescents as poets, showing what fourth and fifth graders can do with poetry in written form. Lastly, I will offer up some examples of U.S. Poets Laureate poems that could translate to children and adolescents in schools.

WHEY PROTEIN ISOLATE-BASED EDIBLE FILMS CROSS-LINKED WITH TRANSGLUTAMINASE
Tara Chastine
Location: Ballroom, 1:30 PM - 3:30 PM
Category: Environmental and Natural Resources-Section 2, Poster
Mentor(s): Zeynep Ustunol (Food Science and Human Nutrition)
Transglutaminase (TG; E.C.2.3, 2.13) is an enzyme that catalyzes cross-linking reaction between glutamine and lysine amino acids in proteins. This study tests the water solubility of Whey Protein Isolate (WPI) based edible films treated with TG. Films were prepared by mixing WPI (5% w/w) and sorbitol (4.6% w/w) into deionized water, heated to 90 + 2°C, homogenized, allowed to cool to 28 + 2°C, vacuum degassed, and cast on a circular Teflon surface to dry ~ 16 h. Water solubility of TG treated films (containing 10, 20, and 30units of TG per gram of WPI) are compared to untreated controls (no TG). The films are dried for 24 hr at 80+2°C, to obtain the initial dry matter weight of the films. The dried films are placed in 50ml of deionized water containing 0.02% (w/v) sodium azide and gently stirred for 24 hr at 23°C.The remaining unsolubilized films are vacuumed-filtered and dried for 24hr at 80oC. The films are then weighed to obtain the weight of the unsolubilized film and the water solubility is calculated. It is hypothesized that treatment of WPI based edible films with TG will decrease the solubility.

SHRINK YOUR MEMORY
Jingming Chen
Location: Gold Room, 1:30 PM - 3:30 PM
Category: Engineering, Computer Sci, and Math-Section 2, Poster
Mentor(s): Carl Boehlert (Chemical Engineering and Materials Science), Per Askerlano (Chemical Engineering and Materials Science)
Nowadays, the Information Era is globalizing. It is characterized by the rapidly increasing ability of individuals to access and transfer information. In order to make life easier, memory storage is being built smaller and finer. The very first computer, ENIAC, was as large as half of a normal sized classroom and weighed 30 tons. In contrast, a Mac book Air is only 0.76 inch thick at its thickest part and weighs 1.4 kg. The objective of the research presented in this poster was to figure out the fundamental aspect of how tremendous amounts of information are stored in limited space. The poster will provide information about the technology and materials used to make memory devices in industry. Detailed pictures of memory storage structures taken by Scanning Electron Microscopy will be presented. Hopefully the information provided in this poster will help inspire future generations to make greater memory available in even smaller chips.

STUNNED TO DEATH OR SIMPLY STUNNED: A STEP TOWARDS A CURE TO LYMPHATIC FILARIASIS (ELEPHANTIASIS)
Situnyiwe Chirunga
Location: Ballroom, 1:30 PM - 3:30 PM
Category: Microbiology, Immunology, and Infectious Disease-Section 4, Poster
Mentor(s): Charles Mackenzie (Pathobiology and Diagnostic Investigation)
Lymphatic filariasis (Elephantiasis), caused by infection of W. bancrofti, B. malayi, or B. timori, is one of the world's leading causes of permanent disability, therefore, a public health concern. Mosquitoes transmit the disease by contracting worm larvae (microfilariae) from an infected human. Microfilariae mature inside the mosquito and are transmitted to a human by a mosquito bite. Complications occur when adults lodge in the host lymphatic system causing blockage of fluids and swelling of appendages. Treatment by dosage of Ivermectin (Mectizan) or similar drugs, kills the microfilariae and destroys female reproductive ability. Improved drug therapies are needed to facilitate killing of adults, which remain alive lodged in the lymphatics. The drug Flubendazole, which either kills or stuns adult worms, may aid in the elimination of worms in infected humans. There is currently no method of determining if adult worms are dead or simply stunned. We are focusing on cell cycle markers NRAS, KRAS and metabolic cycle marker TPI to evaluate worm mortality. We have utilized human antibodies to detect these proteins in adult worms using immunohistochemisty (IHC). We propose to evaluate antibody expression by western blotting to confirm cross-reactivity of the human antibodies with the worms and confirm expression seen on IHC. Unfixed specimens of adult worms are not permitted in this country; therefore we will be using C. Elegans as a surrogate. They are genetically similar to the worms of interest, cost efficient, readily available and fully sequenced.

COMPARISON OF QUANTITY, QUALITY, AND PERFORMANCE OF CANINE DNA COLLECTED FROM SALIVA AND BLOOD SAMPLES
Situnyiwe Chirunga
Location: Parlor B, 11:15 AM
Category: Cell Biology, Genetics, and Genomics, Oral
Mentor(s): Elizabeth McNiel (Small Animal Clinical Sciences)
DNA testing is becoming increasingly important in veterinary medicine for disease prevention, diagnosis, treatment, and canine breed identification. The importance of canine DNA in veterinary medicine prompted us to investigate various collection methods. Our objective was to compare the quantity and yield of canine DNA obtained from saliva using a commercially available kit (Oragene® Animal, DNA Genotek Inc.) with that obtained from blood. Unlike samples derived from cheek swabs, relying on buccal cells, this kit utilizes DNA from lymphocytes contained within the saliva sample. DNA was isolated from paired saliva and EDTA blood samples collected from 84 pet dogs. DNA quality and yield were assessed using spectrophotometry, SYBR® green fluorometry, and agarose gel electrophoresis. DNA was also evaluated in a PCR reaction. Samples or techniques were compared using a paired t-test. DNA obtained from both saliva and blood was of high molecular weight. When corrected for turbidity (absorbance at 320 nm), 260:280 absorbance ratios were similar between saliva (1.69 ± 0.33) and blood (1.75 ± 0.06). The mean DNA yield per saliva sample was 10.7 ug and 18.0 ug for the animal kit as measured by fluorometry and spectrophotometry, respectively. The mean DNA yield per ml blood was 23.6 ug (fluorometry) and 29.8 ug (spectrophotometry). Fluorometer and spectrophotometer measurements were significantly different for saliva samples. This study demonstrates that canine saliva can provide reasonable quantities of high molecular weight DNA that is of high enough quality to support downstream applications such as PCR.

EFFECTS OF ENDOCRINE DISRUPTORS, METHOXYCHLOR AND VINCLOZOLIN, ON IN VITRO BIOMARKERS OF TUMOR PROMOTION AND EPIGENETIC TOXICITY

Rajus Chopra

Location: Gold Room, 1:30 PM - 3:30 PM

Category: Cell Biology, Genetics, and Genomics-Section 3, Poster

Mentor(s): Pavel Babica (Pediatrics and Human Development), Brad Upham (Pediatrics and Human Development)

Pesticides, methoxychlor (insecticide) and vinclozolin (fungicide), are endocrine-disrupting chemicals, which have been demonstrated to induce reproductive toxicity and transgenerational epigenetic effects. We investigated effects of methoxychlor and vinclozolin on established in vitro markers of epigenetic toxicity and tumor promotion, i.e., inhibition of gap-junctional intercellular communication (GJIC) and activation of mitogen-activated protein kinases (MAPKs), in rat liver epithelial cells WB-F344. Both chemicals induced rapid dysregulation of GJIC with complete inhibition achieved after a 10-min exposure to non-cytotoxic doses of methoxychlor or vinclozolin. The inhibition of GJIC induced by methoxychlor and vinclozolin was reversible and the communication recovered when the cells treated with chemicals for 30 min were transferred into to the chemical-free medium. Methoxychlor and vinclozolin induced rapid activation of MAPKs ERK1/2 and p38. Although the activation of MAPKs has been implicated in the dysregulation of GJIC, inhibition of GJIC by methoxychlor and vinclozolin was independent of ERK or p38 activation. However, inhibition of phosphatidylcholine-specific phospholipase C (PC-PLC) prevented the inhibition of GJIC by methoxychlor or vinclozolin suggesting that methoxychlor and vinclozolin inhibited GJIC via a PC-PLC dependent mechanism similarly to lower molecular weight polycyclic aromatic hydrocarbons, non-coplanar PCBs or DDT. Our study identified a new in vitro mechanism of toxicity of methoxychlor and vinclozolin; inhibition of GJIC and activation of MAPKs, which could be potentially involved in their transgenerational epigenetic in vivo effects and/or indicate their in vivo tumor promoting properties.

SCREENING EUGLENIOD SPECIES FOR OPTIMAL WAX ESTER SYNTHESIS

Melissa Clark

Location: Ballroom, 1:30 PM - 3:30 PM

Category: Agriculture and Animal Science, Poster

Mentor(s): Richard Allison (Plant Biology)

Several algae species appear to have the capacity to become biorenewable and sustainable sources of wax esters. With commercial uses of wax esters ranging from components of cosmetics to high temperature lubricants, a sustainable cost-effective source is desirable. Current synthetic production provides a low quality product, while natural sources are either expensive or non-sustainable. Euglena gracilis, a single celled algae, has the biosynthetic capacity to synthesize reasonable quantities of wax esters when grown in the dark with a suitable organic carbon energy source such as ethanol. This study sought to: 1) screen a collection of related Euglenoid species for wax ester synthesis under both autotrophic and heterotrophic conditions and to 2) determine optimal environmental and nutritional conditions for wax ester biosynthesis in selected species. The use of glycerol, a biodiesel byproduct, as a carbon source was also examined. With ethanol as a nutrient, 13 of 36 Euglenoid species tested were capable of growing in the light and 5 of these species also grew in the dark. Nine of the ethanol light grown species produced wax esters in the light, while only two of these, including E. gracilis, produced wax esters in the dark. With the capacity to synthesize wax esters with limited external energy requirements, selected species are being considered for large scale wax ester production. An agricultural cooperative is envisioned for off season growth with a central facility for wax ester purification.

A MULTICULTURAL EDUCATION PEDAGOGY

Adam Clements, Erika Gardner, Kelly Knupfer, Kylie Spears

Location: Tower Room, 1:00 PM

Category: Education, Oral

Mentor(s): Sonya Gunnings-Moton (Student Support Services and Recruitment)

We believe that when multicultural education is used effectively in a classroom, it builds a community among students and administrators, which in turn allows students to create a social identity, uses students' life experiences to accumulate combined knowledge of everyone's thoughts and ideas, and views language as an inhibitor rather than a barrier. Because of our experiences at the Refugee Development Center, we have learned that by properly applying multicultural education in our classrooms, we achieve all of the things listed above; and that by achieving those things, the students are able to reach maximum potential in all subjects. Our performance introduces four main themes prevalent in our experiences at the RDC; social identity, knowledge, community, and language. These seemed to be viewed as social and academic barriers for the students we interviewed. In our presentation we discuss how these four themes affect students on a daily basis in the classroom and in American society in general. After discussing this, we explain how applying multicultural education in the classroom can prove to be extremely beneficial not only for refugee students, but all other students in the classroom.

BIOMARKER FOR OBESITY AND COLON CANCER RISK

Andrea Coffman

Location: Ballroom, 9:30 AM - 11:30 AM

Category: Health, Food, and Wellness, Poster

Mentor(s): Jenifer Fenton (Food Science and Human Nutrition)

Obesity has risen at a rapid rate in the United States. It is anticipated that with increased obesity colon cancer cases will increase; therefore, research regarding how obesity increases the risk of colon cancer is extremely timely, important and will affect upcoming generations. Adipose tissue secretes proteins that lead to a systemic inflammatory state associated with obesity and subsequent colon cancer risk. There is increasing interest in using serum analysis of proteins to identify biochemical indicators of a disease process with clinical utility (i.e., biomarkers) for assessing obesity-associated colon cancer risk. However, a gap exists in our understanding of the overall pattern of changes in the biomarker profile in serum of individuals based on adiposity and how that may relate to obesity-associated colon cancer risk. The primary purpose of this project is to assess the danger of colon cancer in obese individuals. In obese people the adipose tissue secretes hormones and growth factors. The short-term goal is to find a pattern for the stages of colon cancer patients and their obesity levels. The patients will range from nonexistent colon cancer, to individuals who do have colon cancer and have a range of adipose tissue. The hypothesis of this proposal is that patterns of

proinflammatory proteins in serum will differ among lean (BMI≤21), normal (BMI 24-25), and obese (BMIâ‰¥30) individuals and influence colon cancer carcinogenesis.

THE EFFECTS OF ERAP2 ON ANTIGEN PRESENTATION
Eric Collins
Location: Ballroom, 9:30 AM - 11:30 AM
Category: Microbiology, Immunology, and Infectious Disease-Section 1, Poster
Mentor(s): Ian York (Microbiology and Molecular Genetics)
Antigen presentation, an important function in immune responses to foreign pathogens, is modulated in the endoplasmic reticulum by an aminopeptidase known as endoplasmic reticulum aminopeptidase 1 (ERAP1). Peptides of a length of 8-10 amino acid residues are displayed on the cell's surface by a molecular complex called the MHC complex. ERAP1 has an important effect on antigen presentation because it can cleave peptides to fall into the 8-10 residue range, or it can cleave peptides so that they no longer fit this criterion. ERAP2, an aminopeptidase closely related to ERAP1, shares a zinc-binding motif and its characteristics of catalytic activity with ERAP1. Unlike ERAP1, which can cleave after a variety of different amino acid residues at the amino-terminus, ERAP2 seems to be much more specific in its affinity for residues. To test this, I measured ERAP2's ability to degrade peptides with varying amounts of residues upstream of SIINFEKL via flow cytometry. ERAP2 increased presentation of some peptides while decreasing the presentation of others, and it showed no obvious preference for cleavage of specific amino acid residues. Further work with a larger and more diverse repertoire of peptides should yield more insight into this phenomenon.

STUDENT CONFIDENCE IN ORGANIC CHEMISTRY AND PERCEPTIONS OF CONNECTIONS BETWEEN GENERAL AND ORGANIC
Alexandra Collins-Webb
Location: Tower Room, 2:15 PM
Category: Education, Oral
Mentor(s): Ryan Sweeder (Division of Science and Math Education)
An unfortunate perception of many students is that general and organic chemistry are completely unrelated. Many students think of organic chemistry as a "weeder" course, and many then leave organic without a clear understanding of its applications. As organic chemistry can have a hairy reputation among students, it is important that they are confident in their preparation and ability to succeed in this upper-level science course. In this study, student perception of the transition from general to organic chemistry was evaluated through free response, Likert-scale, and limited choice questions. Students illustrated general trends of concern such as feeling ill-prepared (26.0%) and memorization (14.4%). They also provided insight into the aspects of general chemistry were perceived as most helpful to organic chemistry such as class format (58.8%) and course content (28.3%). Confidence in chemistry before and after organic chemistry was evaluated as an integral part of the student experience. This survey was administered through the course management tool ANGEL to students who had enrolled in organic chemistry I at MSU during Fall 2006, Spring 2007, Summer 2007, or Fall 2008 (N=2898) in which 1129 responded with informed consent.

ADDRESSING CLIMATE CHANGE IN THE US: PUBLIC OPINION, SCIENCE, AND THE US LEGISLATURE
Cory Connolly
Location: Lake Erie Room, 11:30 AM
Category: Social Science: General-Section 1, Oral
Mentor(s): Michael Schechter (International Relations)
With immediate action required, but with uncertain consequences in the distant future, climate change poses a difficult riddle for US democracy. A result of an arduous negotiation between legislators, executive officials, non-governmental organizations, and private business, the American Clean Energy and Security Act (ACES) was a momentous political success when passed by the House of Representatives in June, 2009. However, as a product of a deliberative democratic debate, ACES demonstrated a disconnect between the legislative process and scientific facts. More recent federal and state level initiatives highlight this trend as well. The political successes and failures of climate legislation in the US indicate that an alternative method of addressing climate change is necessary. This research, by interviewing various experts and legislators close to the Senate climate change debate, examines the role of science and public opinion in addressing climate change and the implications of the Senate debate for addressing other environmental concerns through legislation. Particularly, it will look at why, as science on climate change becomes more conclusive, the prospects for legislative action are diminishing. I anticipate that this research will highlight how popular opinion, not science, often drives the legislative debate giving decision-makers a very short time scale. This makes climate change an exceptional issue that requires insulated deliberation that is removed from the immediate concerns of the public and that allows for long-term decision making based on science.

IT'S TIME TO PLAY WITH YOUR FOOD: THE EFFECTS OF DURATION OF ADVERGAME PLAY AND AGE ON CHILDRENS BRAND PREFERENCES
Adam Contois
Location: Ballroom, 9:30 AM - 11:30 AM
Category: Communication Arts and Sciences, Poster
Mentor(s): Elizabeth Quilliam (Advertising, Retailing and Public Relations)
Today children are exposed to media at unprecedented levels, with the Kaiser Foundation reporting that children use media for recreational purposes on average 7½ hours per day, including 1½ hours on the computer. At the same time, childhood obesity has reached epidemic status. Food marketing has been identified as contributing to children's unhealthy diets; yet now food marketers have followed children online, incorporating their brands into free interactive games known as advergames. With this study I am going to examine how this new advertising tactic influences children. Specifically I will explore the effects of the amount of time spent on a specific advergame site, the child's age and prior experience as they relate to brand preference and brand attitude changes after game play. To do this, I will work with 40 children from Pinecrest Elementary Before and After School Program. The study will consist of pre and post testing as well as observing the children engaged in playing an advergame. My goal is to come to a better understanding of how these advergames influence children's brand preferences and dietary choices. I will present the data collected. I anticipate the results of my work to demonstrate the impact that advergames have on

children, their choices, and how they are related. Data collected in my research will be used in a future study conducted by professors in the Department of Advertising, Retailing and Public Relations and can help inform public policy regarding food advertising and children.

EXPRESSION AND ROLE OF ATP BINDING CASSETTE TRANSPORTERS IN CANINE OSTEOSARCOMAS
Virginia Cook
Location: Parlor B, 11:00 AM
Category: Cell Biology, Genetics, and Genomics, Oral
Mentor(s): Vilma Yuzbasiyan-Gurkan (MMG)
Osteosarcoma is the most common primary bone tumor of human and dogs. The tumor is highly resistant to conventional chemotherapies. ATP Binding Cassette (ABC) transporters are involved in drug efflux process, and therefore, have been implicated in the multidrug resistance. The purpose of this study is to evaluate the gene expression of the ABC transporters commonly associated with the drug resistance and investigate possible treatments that could make for more effective chemotherapy treatments. Primary cultures of osteosarcoma cells were established in-house from tumor samples obtained from primary tumor sites. Canine specific primers were designed for three common ABC transporters: ABCG2, multidrug resistance 1(MDR1), and MDR1-related protein 1 (MRP1), and were validated by using dog liver tissue as a positive control. Reverse transcriptase-PCR (RT-PCR) analysis showed that all canine osteosarcoma cell lines express the mRNA for these transporters. Real-time PCR techniques have been used to measure the relative abundance of expression among various canine osteosarcoma cell lines. This provided critical information as to which ABC transporters are expressed and to what extent in canine osteosarcomas. MTS assay will be used to evaluate the effectiveness of cytotoxic agents on the established cell lines. Then continue by comparing the response of the cell lines when ABC transporter specific inhibitors are included into chemotherapy treatment. This study will lay down the foundation for determining the correlation between expression of these transporters, chemotherapeutic resistance, and alternative treatments for osteosarcomas.

I AM DAVE
Brad Corlett
Location: Green Room, 10:00 AM
Category: Digital Media-Section 1, Oral
Mentor(s): Amol Pavangadkar (Telecommunications)
This short film is a comedic look into the business world. This office is run by quirky bosses whose antics wind up getting themselves in trouble. When the corporate office finds out about their excessive spending habits the low level employees pay for it.

CHILDREN'S COMPREHENSION OF MORE AND LESS
Jackie Cosan, Angela Khamphouy, Joy Morgan, Sophia Napolitano
Location: Ballroom, 9:30 AM - 11:30 AM
Category: Psychology-Section 2, Poster
Mentor(s): Alan Munn (Linguistics), Cristina Schmitt (Linguistics)
Many experimenters in linguistics and psychology have investigated child comprehension of “less” and “more”. Previous researchers have concluded that acquisition of “more” occurs earlier in children’s language development than “less”. There is debate, however, as to whether children who have not acquired “less” treat the word as a synonym for “more”. Furthermore, researchers have debated whether count or mass nouns are easier for comprehension of “less”. Our research investigates these questions through children’s placement of stickers on images of water glasses and apple trees. Children were asked to place a blue sticker representing water on an empty glass to make the glass have more or less than the control. Similarly, children were presented with images of apple trees and were asked to place apples on the empty try so that there were more or less than the control. The water glasses assessed knowledge of mass nouns. Conversely, the apple trials assessed knowledge of count nouns. We hypothesize that children demonstrate knowledge of “more” at a greater rate than that of “less”. Additionally, we hypothesize that children perform better in the count noun trials than in the mass noun trials in both the “less” and “more” condition. Finally, we believe that results will support the findings that “less” does not mean “more” for children who have not acquired “less”.

EXAMINATION OF THE EFFECTS OF PHYTOCHROME CHROMOPHORE DEFICIENCY ON ROOT GROWTH AND ELONGATION IN ARABIDOPSIS THALIANA
Stephanie Costigan
Location: Ballroom, 1:30 PM - 3:30 PM
Category: Agriculture and Animal Science, Poster
Mentor(s): Beronda Montgomery (Biochemistry and Molecular Biology)
For proper growth and development, plants monitor and adapt to changes in their light environment. Photoreceptors are light-absorbing molecules that mediate cellular and developmental processes. Plant phytochromes are red/far-red light-absorbing photoreceptors with phytochromobilin as the chromophore. Jasmonic acid (JA) is a hormone that regulates defense responses against pathogens, growth and development, and reproduction in Arabidopsis thaliana. The phytochromobilin biosynthetic pathway and JA-mediated signaling pathway have opposing biological effects. To study the effects of phytochrome chromophore deficiency on root growth and elongation and to further understand the relationship between phytochromobilin biosynthesis and JA signaling, we analyzed the impact of treating distinct transgenic Arabidopsis lines exhibiting constitutive or tissue-specific expression of a gene that encodes a mammalian enzyme called biliverdin reductase (BVR) with JA. We previously demonstrated that BVR accumulation induces phytochrome chromophore deficiency in vivo. External JA treatment inhibits root growth; therefore comparative analyses of root elongation among BVR-expressing transgenic lines and appropriate mutants were conducted. Our data show that lines accumulating BVR in roots displayed longer roots compared to wild-type plants in the presence of JA. However, previous results showed that phytochromobilin biosynthetic mutants exhibit shorter roots in the presence of JA relative to the cognate wild type. Presence of longer roots in BVR lines treated with JA indicates that either these plants are insensitive to JA or that the presence of BVR in plastids affects plastid metabolism causing general adverse effects. Further experimentation is underway to gain additional insight into the relationship between JA and phytochrome chromophore deficiency.

REGULATION OF PROGESTERONE AND ANDROSTENEDIONE PRODUCTION BY GRANULOSAL AND THECA CELLS IN CATTLE WITH A LOW VERSUS HIGH ANTRAL FOLLICLE COUNT (AFC)

Angela Crudgington

Location: Ballroom, 1:30 PM - 3:30 PM

Category: Agriculture and Animal Science, Poster

Mentor(s): Joe Folger (Animal Science), James Ireland (Animal Science), Janet Ireland (Animal Science)

Progesterone and androstenedione are LH regulated steroid hormones produced by the ovary that have roles in fertility in cattle. Our recent laboratory studies showed that cattle can be phenotypically classified into two groups, low or high, based on their inherently high variation in AFC and that these two groups may have differential LH responsiveness. The hypothesis studied was the chronically heightened secretion of LH in cattle with a diminished AFC has a negative impact on LH stimulated progesterone and androstenedione production by ovarian cells. Granulosa cells are the primary producers of progesterone, while theca cells produce androstenedione, and LH regulates both. Granulosa cells were isolated and subjected to serum free culture with and without different doses of bovine LH for various lengths of time. Concentration of progesterone was determined in media by radioimmunoassay. Results demonstrated that granulosa cells did not produce progesterone in response to LH in a dose dependant fashion, thus this culture system could not be used to determine if the variation in AFC impacted responsiveness of granulosal cells to LH. Bovine theca cells were collected and cultured for 24 hours with or without LH. LH stimulated androstenedione production was 2.5 fold greater for theca cells with high vs low AFC. Results show the variation in AFC in cattle is positively associated with capacity of thecal cells to respond to LH and produce androstenedione, implying ovarian androgen production may be greater in cattle with high AFC.

HOMICIDE CONVICTION RATES

Bryan Czako

Location: Lake Erie Room, 2:00 PM

Category: Social Science: General-Section 2, Oral

Mentor(s): Jesenia Pizarro (Criminal Justice)

My faculty member has gathered information from about 600 homicides in the Newark, New Jersey area, and we will have completed detailed variable analysis to present. We are interested in observing which variables prove to have significant roles in determining sentence length when it comes to homicide convictions. We expect to find that extralegal variables like newspaper coverage, gender, and race have some effect on convictions.

GRAIN SHAPE ANALYSIS OF SAND FROM MSU'S RECENTLY DISCOVERED DUNE

Michael Daniels

Location: Ballroom, 9:30 AM - 11:30 AM

Category: Physical Sciences, Poster

Mentor(s): Michael Velbel (Geological Sciences)

This project examines the sphericity and roundness of individual quartz grains from the dune recently discovered on MSU's campus. Optically stimulated luminescence methods establish the dune to be about 16,000 years old. It is unusual to find a dune so far inland and with so little post-depositional modification. Images of sand grains have been acquired using a scanning electron microscope. Sphericity, roundness, and related surface textures indicate the type of transport, and the total abrasion that these grains experienced. These images are organized so that they can be grouped by varying measurements of sphericity and roundness, in support of an overall conclusion regarding the process by which this sand dune formed. The grains on average show medium sphericity and a range of roundness from sub rounded to sub angular. The images show that mechanical processes have affected these grains. These results suggest that the grains were not subject to prolonged smoothing and rounding by abrasion during reworking by wind before final transport and deposition of the sand by wind. This information, compared with other examples of sand dunes, and historical records of glacial transportation provide further insight into the newly discovered dune. This contributes evidence as to how a sand dune is located in the middle of campus and provides an understanding of sediments during the time of glaciers.

WHEN ZOMBIES ATTACK

Mark Davison, Trevor Leach, Mitch McDonald, Olukemi Mejabi, Josh Shackmann

Location: Ballroom, 1:30 PM - 3:30 PM

Category: Microbiology, Immunology, and Infectious Disease-Section 4, Poster

Mentor(s): Igor Narzov (Mathematics)

A spread of a contagious disease of high virulence is discussed in this project. The project focuses predominately on the particular case of a zombie attack on humankind, mainly because a zombie outbreak, however very unlikely, would have a devastating impact on any population. A number of variables and parameters were considered in order to most effectively recreate the stereotypical zombie infestation seen in horror films in Hollywood. Our goal is with help of mathematical modeling to demonstrate that the consequences of such an outbreak are not as unpredictable as one might assume. The project investigates the probability of a zombie apocalypse, and discusses the drastic measures that must be taken by mankind in order to exterminate the zombies and achieve salvation. The project also introduces a zombie immunization and analyzes how a cure to the outbreak would affect the dynamics of the system, and how it would increase the chances of mankind's survival. Our project is based on ideas of Philip Munz, Robert J. Smith, and others.

FRENCH TEXT, GLOBAL GAZE: THE URBAN IMAGINARY IN TRANSNATIONAL FRANCOPHONE LITERATURE
Joseph DeLeon
Location: Lake Huron Room, 2:45 PM
Category: Humanities and Peforming Arts-Section 2, Oral
Mentor(s): Safoi Babana-Hampton (French, Classics, and Italian)
"La Francophonie," the globally diffuse collection of former French colonies, defies any simplistic binary scheme of "colonizer" and "colonized": Algeria, Senegal, and Quebec undoubtedly articulate different relationships to France due to a continuum of unique histories, geographies, and cultures. Thus, La Francophonie is fractured, with a variety of urban spaces, networks, and narrative voices that articulate the myriad forms of Francophone identity. How can La Francophonie persist, especially when faced with the English language's hegemonic influence? How can anyone interested in the democratization of narrative voices conceptualize globalization's effect on literature? In order to address these issues, my project will focus on two complementary terrains: transnational Francophone literature and postmodern urban space. The multilayered interaction between these terrains will reveal the "urban imaginary," a way of reading a physical urban landscape that exposes internal geographies of affect, oppression, and resistance in Francophone identity. In order to highlight globalization in Francophone identity formation, I will insert the United States in a developing typology of the urban imaginary as seen through select texts: the African city seen through African eyes; Paris experienced by immigrants; the United States viewed from Africa and France; and the United States experienced in person. Applying a poststructuralist, actor-network theoretical outlook on the urban spaces evoked in these works, I intend to present a picture of the power of Francophone literature to surpass former colonial definitions and to create provocative interpretations of our eternal infatuation with the city.

MICHIGAN POLICY NETWORK
Jessica DeLoach
Location: Ballroom, 1:30 PM - 3:30 PM
Category: History, Political Science, and Economics, Poster
Mentor(s): Matt Grossman (Political Science)
Michigan Policy Network is a student-led public education and research program to report and organize news and information about the political process surrounding Michigan state policy issues. My position in this program is that of the Criminal Justice Policy Fellow. The demonstration of my work over the last year will constitute of an overview of the candidate's for Michigan's gubernatorial race on November 2, 2010. This overview will contain highlight some of the criminal justice proposals instituted by these candidates along with an outline of some of the recent legislative proposals regarding criminal justice and the position these candidates have taken on them. The race has been predicted to be very competitive and because of this, it is essential that all of Michigan's citizens pay close attention to the election and use their right to vote in such a manner that the state of Michigan can be improved from its current inopportune state. The main goal of this project will be to educate and inform its audience of the current state of Michigan and the potential that its future holds.

IDENTIFICATION AND CHARACTERIZATION OF A NOVEL PROTEIN IDENTIFIED FROM THE EPIDERMIS OF RAPIDLY GROWING CORN COLEOPTILES
Emily Detwiler
Location: Gold Room, 1:30 PM - 3:30 PM
Category: Biochemistry and Molecular Biology-Section 2, Poster
Mentor(s): Susanne Hoffman-Benning (Department of Biochemistry)
Plant cell walls (CW), as well as the overlaying cuticle, play a vital role in plant growth, development and the interaction with their environment. As the cell and tissue expands, CW and cuticle biosynthesis must occur at an increased rate. Ultrastructural examination has revealed the appearance of osmiophilic particles, which are associated with the outer epidermis of growing tissues, that go through the secretory pathway, and are proteinaceous. Their location and time of appearance suggests that they are related to either CW or cuticle biosynthesis. Earlier experiments had revealed over 80 proteins in the outer epidermis that are induced during rapid growth. In addition to 15 proteins that are predicted to be involved in either CW or cuticle biosynthesis or trafficking, we found three proteins of unknown function (Hyp 2-4). Expression patterns of the proteins were confirmed using RT-PCR and microarray analysis. They indicate that the PLTP, the reversibly glycosylated polypeptide, UDP-glucose pyrophosphorylase, fiber dTDP glucose 4,6 dehydratase, sec15 as well as Hyp3 and Hyp4 are induced at the transcriptional and at the protein level. We are now in the process of cloning the Hyp4 gene and studying the protein's localization as well as its effect on growth and development in knock-out mutants. We will use yellow fluorescence protein tags to trace the location of the hypothetical protein using Tobacco as a model plant.

INVESTIGATIONS INTO THE NICKEL-DEPENDENT STABILIZATION OF A UREG-UREE COMPLEX VIA SITE-DIRECTED MUTAGENESIS
Brittnie DeVries
Location: Gold Room, 1:30 PM - 3:30 PM
Category: Biochemistry and Molecular Biology-Section 2, Poster
Mentor(s): Robert Hausinger (Microbiology and Molecular Genetics)
Urease, a nickel-containing enzyme, requires a series of four accessory proteins for activation: UreD, UreE, UreF, and UreG. The goal of these experiments was to characterize the interaction of UreG with urease (UreABC) and the other accessory proteins. In order to characterize this interaction, highly conserved UreG residues were selected for site-directed mutagenesis. These mutations were created in *Strep*-tagged UreG ($UreG_{Str}$), which binds tightly to *Strep*-Tactin resin, thus allowing for pull-down assays to reveal associated proteins. Two different types of pull-down assays were performed. First pull-downs were performed using *Escherichia coli* DH5-α cells that over-expressed the *Klebsiella aerogenes* urease cluster modified to encode $UreG_{Str}$ or its variants, and grown with and without nickel ions. Cell-free extracts were obtained and pull-down assays revealed the presence of the UreABCDF complex, except in the case of D80A $UreG_{Str}$ where the interaction was interrupted for all components except UreE. These assays also indicated that nickel stabilized the interaction between $UreG_{Str}$ and UreE, but not with urease, UreD, or UreF. A second set of pull-down assays used purified $UreG_{Str}$ or its variants plus isolated UreE, and the effect of varied nickel ion

concentration was again examined. The interaction between $UreG_{Str}$ and UreE was stabilized when nickel was present, and none of the site-directed mutations disrupted this interaction.

THE MEANING OF PLURALS
Karl DeVries, Scott Osdras
Location: Ballroom, 9:30 AM - 11:30 AM
Category: Psychology-Section 1, Poster
Mentor(s): Alan Munn (Linguistics), Cristina Schmitt (Linguistics)
Generally singular determiner phrases, e.g. 'a dog', are taken to mean 'one' and plural determiner phrases, e.g. 'dogs', to mean 'more than one'. This claim has recently been challenged, and it is claimed that the 'more than one' interpretation that plural determiner phrases receive is not part of the meaning of the expressions but rather the result of an implicature. To further investigate this claim, this experiment uses a truth value judgment task in which subjects are asked to evaluate sentences involving the determiners 'a' and 'exactly one' and bare plurals in statements, questions, and downward entailing environments. Because implicatures are calculated with reference to what could have been said, we hypothesize that if subjects are presented with the determiner 'exactly one' before 'a' and bare plurals, their interpretations of latter determiner phrases will vary compared to conditions in which it is not presented.

NYAKA NUTRITIONAL ASSESSMENT PROJECT
Monika Dietrich
Location: Ballroom, 9:30 AM - 11:30 AM
Category: Health, Food, and Wellness, Poster
Mentor(s): Maurice Bennink (Food Science and Human Nutrition)
There are high levels of childhood undernutrition in Uganda, Africa and symptoms include greater susceptibility to illness, stunting, wasting, lagging brain development, fatigue and death. A step taken to fight childhood malnutrition is the installment of meal programs in private not-for-profit schools including the Nyaka AIDS Orphans School, which works with around 300 students. The purpose of this study is to compare the general nutritional status of the students of the Nyaka AIDS Orphans School relative to international standards and to children without access to a school meal program utilizing anthropometric methods. The data may then be used by the school and community to help determine the general nutritional health of the students, as well as possibly examine the efficacy of the school meal program. Weight-for-height, weight-for-age and age-for-height data will be cross-referenced to World Health Organization (WHO) international standards. Nyaka student versus non-Nyaka student data will be compared, as well as anthropometric data versus time in the Nyaka School. I hypothesize that the nutritional status of children attending the Nyaka School will be better than that of children not attending a school with a meal program, but that both groups of children will fall in the low to below healthy ranges of WHO standards.
IRB Approved no. 09-787

RESPONSIBILITY AND REACTION: GENOCIDE, HUMANITARIAN AID, AND MILITARY INTERVENTION
Horia Dijmarescu, Shera Novak
Location: Tower Room, 9:30 AM
Category: History, Political Science, and Economics, Oral
Mentor(s): Christina DeJong (Criminal Justice)
Samantha Power quotes former National Security Advisor Lt. Gen. Brent Scowcroft as having analyzed US intervention in Somalia as, "intimately connected with [the Bush Administration's] decision to not intervene in [Bosnia]." Since the end of the Cold War the record of the United States concerning international aid and intervention in cases of genocide has been weak. Genocides have raged in Bosnia, Rwanda, and Darfur without any substantial interference from the United States. On the other hand, the United States has been more engaged in providing humanitarian and military assistance in non-genocide, smaller-scale humanitarian situation including in Somalia, Haiti, and numerous other countries/regions. This paper creates a time line for genocidal and non-genocidal conflicts, US involvement therein, and public opinion in the United States concerning international intervention. To determine US involvement we analyze the US impact on Security Council outcomes, amount of economic/humanitarian assistance given by the US in each case, the number of troops/equipment donated by the US per mission, as well as the incidence of unilateral US action. We also examine the estimated cost of involvement in each proposed intervention to determine whether less costly actions were favored over more costly ones. We interpret the aforementioned data using regression analysis. The result is a report on the relationship between intervention and public opinion polls regarding intervention in occurrences recognized as genocide.

SEQUENCING OF PGZRS19 TO FACILITATE CONSTRUCTION OF REPORTER PLASMIDS
Karin Dionne
Location: Ballroom, 1:30 PM - 3:30 PM
Category: Microbiology, Immunology, and Infectious Disease-Section 4, Poster
Mentor(s): Rhiannon LeVeque (Microbiology and Molecular Genetics), Martha Mulks (Microbiology and Molecular Genetics)
Actinobacillus pleuropneumonia (APP) is the causative agent of porcine pleuropneumonia, a severe and often fatal respiratory infection in swine. Research on APP is necessary for the development of improved vaccines, diagnostic techniques, and treatments that would benefit the swine industry worldwide. As a part of ongoing studies on APP in our laboratory, we are developing reporter plasmids to facilitate identification of APP gene promoters that are expressed under specific conditions, such as amino acid starvation. One reporter system under construction will contain a promoterless lacZ gene from E. coli cloned into the vector pGZRS19, which was designed as a shuttle vector between APP and E. coli, with a multi-cloning sit upstream of lacZ to allow insertion of APP promoters. Other reporter systems are also planned and will need to be constructed in pGZRS19. The goal of my project was to determine the complete sequence of the pGZRS19 plasmid. In this project, I purified plasmid DNA, designed sequencing primers, verified that the primers bound to plasmid DNA by PCR reactions, performed sequencing reactions, and analyzed and complied the sequence data. This required several rounds of primer design and sequencing to complete the sequence of the full 4613 bp plasmid. This sequence data will now facilitate future design of cloning primers and PCR primers to successfully construct a reporter plasmid containing the promoterless lacZ gene and other reporter systems, providing the tools to screen for promoter function in APP.

TRANSIENT HYPERMUTABILITY AND THE LURIA-DELBRÜCK DISTRIBUTION
James Dittmar
Location: Gold Room, 9:30 AM - 11:30 AM
Category: Cell Biology, Genetics, and Genomics-Section 2, Poster
Mentor(s): Jeffrey Barrick (Microbiology and Molecular Genetics)
One of the basic requirements for evolution to occur is phenotypic variation. As Darwin imagined it, one of the primary mechanisms for generating variation is mutation. As a result of mutation, organisms pass on a slightly modified version of their genotype. Mutations that increase the organism's ability to compete in the environment will increase in frequency. Mutations, however, may not be the only source of phenotypic variation. Single cell and single gene variation in protein product levels are a result of considerable cell-cell gene expression stochasticity. Epigenetic (non heritable) modes of phenotypic transmission may play a key role in affecting mutational outcomes by producing organisms that can transiently generate more mutations. To further explore the degree to which transient hypermutators contribute to mutational dynamics, we have re-examined a classic experiment in biology. We have used experiments and statistical analysis to demonstrate that transient hypermutators explain our observations of the distributions of mutants more accurately than the more general model proposed by Luria and Delbrück.

BIOPHYSICAL BASIS UNDERLYING TRADE-OFFS
Devin Dobias
Location: Ballroom, 1:30 PM - 3:30 PM
Category: Microbiology, Immunology, and Infectious Disease-Section 3, Poster
Mentor(s): Richard Lenski (Microbiology and Molecular Genetics)
Trade-offs between a host's resistance to parasites and its competitive fitness in the absence of parasites are thought to be widespread. Although many studies have documented such trade-offs, the biophysical basis for the trade-offs are rarely known. Understanding the basis is essential to predict what form and magnitude the trade-off takes, as well as predicting how the relationship might vary across environments. With this deeper understanding, ecologists will be better equipped to understand population dynamics and conditions for coexistence. For this study, I used a model microbial host and parasite system, Escherichia coli and bacteriophage λ, to investigate the biophysical basis of host tradeoffs in this interaction. I generated a library of resistant E. coli and measured their costs of resistance. I then employed three-dimensional protein models of the mutant proteins to probe the functional basis for the cost to resistance. Host resistance usually involved mutations in the gene encoding a surface receptor protein, maltoporin, and those mutations were the focus of my analysis. These mutations typically produce structural changes within the loops of this receptor. These changes appear to cause one of two negative effects on the function of the porin. The mutated loops inhibit the uptake of resources, or they may promote the entrance of toxins into the cell. I found that the magnitude of these negative effects correlated with how severely the mutations distorted the porin's predicted three-dimensional confirmation.

CONGENITAL HYPOTHYROIDISM WITH GOITER IN TENTERFIELD TERRIERS IS CAUSED BY A NOVEL MUTATION IN THE THYROID PEROXIDASE GENE
Stacie Dodgson
Location: Gold Room, 9:30 AM - 11:30 AM
Category: Cell Biology, Genetics, and Genomics-Section 1, Poster
Mentor(s): John Fyfe (Microbiology and Molecular Genetics)
Congenital hypothyroidism (CH) is a variable disease characterized by various clinical pathologies including dwarfism, delayed development and mental retardation. Errors of metabolism leading to CH with goiter (CHG) include inability of the thyroid to concentrate iodide, defects of iodide bonding to thyroglobulin (TG), and defects in TG synthesis. To identify the mutation causing autosomal recessive CHG in Tenterfield terriers, we performed exclusion analysis using markers flanking functional candidate genes. The genes encoding the sodium-iodide symporter (SLC5A5), thyroglobulin (TG) and dual oxidases 1 and 2 (DUOX 1&2) were excluded based on the failure of markers to segregate with the disease. Conversely, alleles of a simple sequence repeat near the thyroid peroxidase gene (TPO) segregated with the disease in 63 interrelated family members. Therefore, we sequenced all sixteen exons of TPO from genomic DNA of an affected dog and its dam. We identified a novel mutation in exon 9, for which the affected dog is homozygous and the dam is heterozygous, which predicts replacement of the highly conserved Arg581 with Trp. Based on examination of homologous peroxidase crystal structures, we suggest that Arg581 is important for the maintenance of TPO structure by hydrogen bonding with multiple other highly conserved residues. Thus, replacement of Arg581 with a dissimilar amino acid likely disrupts protein folding and obliterates enzyme function in these dogs. Using this information, we developed a genetic test to screen for carriers of the mutation to prevent propagation of this lethal disorder.

CHARACTERIZING PHENOTYPES OF PARKINSONS'S DISEASE IN DROSOPHILA MELANOGASTER
Jack Duffield
Location: Gold Room, 9:30 AM - 11:30 AM
Category: Cell Biology, Genetics, and Genomics-Section 2, Poster
Mentor(s): Kyle Miller (Zoology)
The fruit fly Drosophila melanogaster is a powerful model system for investigating the cellular basis of Parkinson's Disease yet its relevance would be considerably increased if it manifested motor and non-motor symptoms similar to those seen in humans. Leucine Rich Repeat Kinase 2 (LRRK2) is a putative kinase and the gene most commonly mutated in PD patients. Our preliminary evidence demonstrates that flies with mutations in the Drosophila homologue of the gene LRRK2 have resting tremors. The goal of this project is to use video analysis and behavioral tests to characterize motor (movement and tremor) and non-motor (olfaction, sleep, and constipation) phenotypes in a LRRK2 genetic background.

ARTS INTEGRATION METHODS AND STUDENTS SELF-WORTH
Lauren DuLac
Location: Tower Room, 2:30 PM
Category: Education, Oral
Mentor(s): Joni Starr (Theatre)
As an arts integrator I am interested in looking at the effect of my lessons on my seventy-five students. Throughout this semester I looked specifically for instances where I could observe my students owning their work and the process they went through to get there and specifically, how my decisions as an educator contributed to these feelings. As a teacher I want to take a close look at the ways in which I am able to increase my students self-worth. I want to focus on which pedagogical strategies contribute to my student's increased creative ownership and how my students with different needs are effected. As a student, I am interested in discovering my own personal artistry and confidence with my lesson implementation. Therefore, to develop this artistry I will take on coinciding tasks with my lessons. For example, if I am teaching a lesson that involves sculpture, I will take time to sculpt on my own. By doing so, I hope that I will gain more of an understanding of the feelings and emotions of my students that correspond with the tasks I am asking my students to undertake. Therefore, I hope by having a deeper awareness of my students artistically cognitive processes, I will be able to better adapt my lessons to promote confidence with their creative works.

OPTIMIZATION OF AN AGENT-BASED TRAFFIC EVACUATION MODEL USING EVOLUTIONARY COMPUTATION
Matthew Durak
Location: Gold Room, 1:30 PM - 3:30 PM
Category: Engineering, Computer Sci, and Math-Section 2, Poster
Mentor(s): Erik Goodman (Electrical and Computer Engineering)
Emergencies require officials to respond quickly and efficiently to save lives. For planning, a top-down conceptual model is typically used to describe behavior in such a situation. This tends to generalize human behavior and fails to account for individual differences. Agent-Based Models (ABM), in contrast, represent many "agents" interacting with each other and their environments, each according to some set of rules. ABMs are can produce emergent properties of a system under stress. They allow responders to test and compare different strategies. This study uses an ABM of a portion of a city with an irregular grid of roads with varying numbers of traffic lanes. Cars drive to locations determined at random to model normal traffic conditions. An emergency is modeled in which a chemical spill occurs south of the area with wind blowing north, and the drivers must evacuate the area. The drivers act as individuals, with some following instructions and others making stops at intermediate locations. Evolutionary computation is used to seek optimal strategies which minimize the number of casualties and evacuate the area fastest. This method uses an initial population of random strategies and evolves them-using mutation or recombination-while favoring strategies that minimize casualties. The strategies to optimize are the timings of the traffic lights. The aim of this study is to demonstrate the effectiveness this method, illustrating that it may be useful in many situations which can be modeled with an ABM.

AN UPDATE ON THE STRUCTURE OF JAPANESE NOUN PHRASES
Kenneth Edgington
Location: Ballroom, 9:30 AM - 11:30 AM
Category: Psychology-Section 1, Poster
Mentor(s): Cristina Schmitt (Linguistics)
Developments in formal syntax have led to a new way to conceptualize case morphology in natural languages. In this project we examine the structure of noun phrases in Japanese as proposed by Kakegawa (2003) and we update and re-evaluate some of her assumptions using the framework proposed by Adger (2003). Our focus is on case particles, number phrases, and constituent structure. In Kakegawa, case particles are treated as determiners and complementizers while in my analysis following Adger, we treat them as the spell out of abstract features. This leads to re-examinations of other aspects of Kakegawa's analysis.

MICROBIAL IRON REDUCTION AND PHOSPHORUS RELEASE IN THE PRESENCE OF HUMIC ACID
Alyse Egner
Location: Gold Room, 9:30 AM - 11:30 AM
Category: Engineering, Computer Sci, and Math- Section 1, Poster
Mentor(s): Steven Safferman (Biosystems and Agricultural Engineering)
An iron-rich nano-tech media has been studied previously for its ability to adsorb phosphorus from wastewater. In a subsequent experiment, the fate of phosphorus after the media reaches sorption capacity has been examined. By increasing the rate of the microbial reduction of iron, the rate of phosphorus released into solution is also increased. This research evaluates the addition of humic acid as an electron shuttle between Fe(III) and iron-reducing microbes, and the subsequent effect on phosphorus release. The conditions examined include three treatment levels of humic acid, with the addition of a microbial population and nutrient solution, one control treatment lacking the addition of humic acid, and one control treatment lacking a microbial population.

THE RED CEDAR FLOODPLAIN: HISTORICAL IMPACTS OF FLOODING ON A DEVELOPING CAMPUS
Alyse Egner
Location: Ballroom, 1:30 PM - 3:30 PM
Category: Environmental and Natural Resources-Section 2, Poster
Mentor(s): Michael Velbel (Geological Sciences)
Rivers can be both an asset and a barrier to a growing campus. Michigan State University has demonstrated this relationship throughout its history with the Red Cedar River. The University and the City of East Lansing have expanded in a way that places extensive development directly onto the Red Cedar floodplain. This research explores the consequences of development in the floodplain, particularly during and after major historical flooding events in 1904, 1947, and 1975. Several areas of campus are examined to assess past flood damage and evaluate the physical

changes implemented to withstand future floods. Among the areas examined are Jenison Fieldhouse, W.J. Beal Botanical Gardens, the Auditorium, and Demonstration Hall.

PROTEIN FUNCTION IN MYCOPLASMA GENITALIUM
Laurel Eibach
Location: Gold Room, 1:30 PM - 3:30 PM
Category: Biochemistry and Molecular Biology-Section 2, Poster
Mentor(s): Michael Feig (Biochemistry and Molecular Biology)
The bacteria Mycoplasma genitalium has one of the smallest known genomes with 482 coded proteins. Its size makes the bacteria a candidate to model a complete system with the minimum necessary biochemical pathways. To set the foundation to simulate a living system, the functionality of the encoded proteins were examined. These were subsequently used to identify the processes present in the Mycoplasma genitalium. This study utilized computational methods to determine protein function. These methods include amino acid sequence alignment and structure prediction of the proteins. An overview of the system was generated from the annotated protein functions; however it lacks experimental data for the interactions between proteins and unknown adaptations of the bacteria. The study is a step within systems biology reliant upon protein bioinformatics to show the biochemical processes within a minimum bacterial system.

EXHIBITING THE EXHIBITED: ONLINE PORTRAYALS OF THE SILK ROAD
Emily Ekdom
Location: Lake Huron Room, 10:45 AM
Category: Humanities and Peforming Arts-Section 1, Oral
Mentor(s): Catherine Ryu (Linguistics)
This project investigates the relationship between digital technology and our perception of the Silk Road by examining how the Silk Road is portrayed in online exhibitions. The investigation focuses on three institutions websites, which include, Monks and Merchants (2001-2002), from the Asia Society and Museum; Luxury Arts of the Silk Road Empires (2008), from the Smithsonian; and Silk Road Exhibition (2010), from the International Dunhuang Project, a collaboration of institutes across the world. Through the comparative analysis I will determine the extent that museum exhibitions portrayed online have influenced our image of the famous trade route. This research is driven by a set of critical questions, such as: Are the items exhibited chosen to romanticize the idea of the exotic Silk Road? How have the objects presented molded our western societies image of the Silk Road? Most importantly, how have the webpage layouts been organized to further convey the idea of the Silk Road? To answer these questions, I will compare and contrast the ways the three websites are laid out, what objects they include, and the objectives of the exhibitions. Moreover, by analyzing the websites chronologically, I will ultimately determine and demonstrate the extent to which societies idea of the Silk Road is molded and reinforced by the easy accessible and constantly available, museum online exhibitions.

THERMAL INACTIVATION OF SALMONELLA IN GROUND MEAT PRODUCTS
Jessica Emery
Location: Ballroom, 9:30 AM - 11:30 AM
Category: Health, Food, and Wellness, Poster
Mentor(s): Bradley Marks (Biosystems Engineering)
Microbial inactivation models are used in the meat industry to predict microbial inactivation in cooked products. Current models are based on laboratory-scale studies, and have some systematic deficiencies when applied to industrial settings. The objective of this study was to quantify accuracy and uncertainty of these models via pilot-scale tests in continuous cooking systems. Ground pork, beef, or turkey was inoculated with an eight-serovar Salmonella cocktail. Inoculated product was formed into ~120 g patties using a commercial patty maker, and cooked in a pilot-scale, moist-air impingement oven under commercially relevant conditions. The process variables were humidity (20 or 50% moisture by volume), air temperature (149 or 204ï‚°C), and fan speed (20 or 80% full). Internal and surface temperature of the meat patties, and ambient temperature, was measured and recorded real-time during processing, and the inactivation of Salmonella was calculated by previously reported inactivation models. Patties were removed from the oven at a pre-determined core temperature and rapidly cooled in liquid nitrogen. The patties were then sliced into three layers and cored (~50 mm diam, ~4 mm thick). To enumerate survivors, samples were serially diluted and plated on Modified Tryptic Soy Agar plates (37Â°C, 48 h). The counts from the plates were used to calculate the actual lethality. The difference between the actual and predicted lethality was the error in the lethality model due to sub-lethal injury. Any over prediction of pathogen inactivation reflects a risk of a hazardous final product.

GENERATION AND IN VITRO CHARACTERIZATION OF FELINE HERPESVIRUS-1 DELETION MUTANTS
Michael Engstrom
Location: Ballroom, 9:30 AM - 11:30 AM
Category: Microbiology, Immunology, and Infectious Disease-Section 2, Poster
Mentor(s): Roger Maes (Microbiology)
Feline herpesvirus-1 (FHV-1) is a major pathogen of cats accounting for at least 50% of all the diagnosed cases of viral rhinotracheitis, conjunctivitis, and keratitis. Current FHV-1 vaccines need to be improved to enhance their safety and efficacy. In previous studies, our laboratory has used bacterial artificial chromosome (BAC) cloning to insert and maintain the entire FHV-1 genome in Escherichia coli. We have also used recombination mediated genetic engineering (recombineering) to generate deletions, within the FHV-1 genome BAC, in conserved genes associated with virulence, which included gC and gE. In the current study, we introduced a deletion mutation in the gene encoding protein kinase (PK) and are also producing a double deletion mutation in the genes encoding thymidine kinase (TK) and gE. We have used multi-step growth curve analysis and plaque morphology determination to assess the in vitro virulence of the gC deletion mutant. Our findings indicated that the gC deletion mutant produces lower titers of virus, compared to the wild-type parental strain, an in vitro indicator of reduced virulence. However, more work must be done to assess the area of the plaques produced by infection with the gC deletion mutant. In vivo studies are also still needed to assess the safety and efficacy of using these deletion mutants as potential second generation vaccines. Low titers

of virus produced after infection precluded the use of the PK deletion mutant in future studies. The work on the generation and characterization of the TK and gE double deletion mutant is still ongoing.

BRAIN FMRI DURING CHANGES IN FLUID BALANCE
Abigail Entz, Brooke Boer, Anne Elshoff, Tara Gallagher, Matthew Rohloff, Russell Vanmaele
Location: Ballroom, 9:30 AM - 11:30 AM
Category: Psychology-Section 2, Poster
Mentor(s): Joseph Carlson (Radiology), Ronald Meyer (Physiology), Jill Slade (Radiology), Robert Wiseman (Physiology)
Homeostatic control of fluid balance in the body requires the integration of several physiologic signals. For example under conditions of mild dehydration perceptions of thirst are sensed by dryness of the mouth and a desire to drink fluids driven by central control in the brain. In addition, chemical signals within the plasma are integrated in the brain to induce fluid intake. Therefore hydration state depends on both the perception of thirst and the physiologic drive to maintain hydration, which are located in different regions of the brain. To investigate brain (de)activation during these fluid balance changes we utilized functional magnetic resonance imaging of the brain in healthy human subjects. Subjects self-restricted fluid intake (6 hours) prior to the experiment. Fluid balance was assessed using urine osmolarity both before and after intake of a fixed volume of the test solutions. Functional brain images were acquired continuously prior to, during and following consumption of water or a commercially available sports drink. We tested the hypothesis that the time course of brain (de)activation would be different in the regions of the brain that perceive thirst compared to regions that drive the physiologic response. In addition we tested the hypothesis that the time course of brain (de)activation would be different when comparing tap water to a commercially available sports drink.

CHARCOAL IMPROVEMENT OF SOIL AGGREGATES
Melissa Erickson
Location: Ballroom, 1:30 PM - 3:30 PM
Category: Environmental and Natural Resources-Section 2, Poster
Mentor(s): Alvin Smucker (Crop and Soil Science)
Trials were run for treatments of 2, 4, and 6 times of wetting and drying cycles to measure the severity and intensity of the charcoal movement through aggregates. Then, by using Soil Aggregate Erosion (SAE), we can measure the amount of Carbon sequestered in the aggregate. Also, we can determine the concentric tensile strengths to see if the charcoal has increased the erosive resistance of the aggregates. Once trials are completed, we can then test if charcoal would support the creation of a more stable aggregate. This research could provide farmers or the agricultural world with a new, more organically natural fertilizer that is safer and more readily available to the environment.

REPLICATIVE FUNCTION OF SECONDARY RNA STRUCTURES IN MENGOVIRUS
Tyler Errnst
Location: Ballroom, 9:30 AM - 11:30 AM
Category: Microbiology, Immunology, and Infectious Disease-Section 2, Poster
Mentor(s): Cori Fata-Hartley (Microbiology)
The study of secondary structures in RNA virus genomes has led to the conclusion that certain of these structures have an active role in replication and are therefore essential for the virus to produce its progeny. The Mengovirus genome, of the genus Cardiovirus within the Picornaviridae, has been determined and this sequence has been sued to generate a map of the secondary structure of the genome. In this study, a conserved stem loop structure was identified within Mengovirus and site directed mutagenesis was used in an attempt to introduce a structural change which would conserve the translational information and thus leave unaffected the polypeptide which was formed. The hypothesis was that such an alteration would effect a change in phenotype due to the alteration of this structure if it had a catalytic function. The site directed mutagenesis did not work for varying reasons, and the phenotype was therefore never tested for.

AN EXAMINATION OF THE MENTAL HEALTH OUTCOMES OF INTIMATE PARTNER VIOLENCE
Lee Eshelman
Location: Ballroom, 9:30 AM - 11:30 AM
Category: Psychology-Section 1, Poster
Mentor(s): Alytia Levendosky (Psychology)
Female college students (N=516) completed anonymous online surveys to report personal experiences of intimate partner violence as well as symptoms of depression, posttraumatic stress disorder and potential injuries related to the violence. The current study aimed to determine if psychological or physical intimate partner violence, or a combination of both, lead to more or different kinds of mental health problems. This study also examined the severity and frequency of each type of violence in relation to an increase of injury and mental health symptoms. Four groups were made based on their reported scores on the SVAWS and PMWI. Group 0 (N=181) consisted of participants who have never experienced any type of physical or psychological abuse. Group 1 (N=27) consisted of individuals who have experienced psychological abuse only, group 2 (N=133) consisted of individuals who have experienced physical abuse only, and group 3 (N=155) consisted of individuals who have experienced both psychological and physical abuse. Results revealed group 3 had significantly more depressive and PTSD symptoms than all other relevant groups ($p < .01$). Groups 1 and 2 did not differ from each other for depressive or PTSD symptoms but had more depressive symptoms than Group 0. Thus, consistent with trauma theory, presence of abuse as well as presence of more than one type of abuse was related to increased mental health problems, specifically around depression and PTSD.

VACCI-NATION
Margaret Eyke, Samantha Surrell
Location: Ballroom, 9:30 AM - 11:30 AM
Category: Health, Food, and Wellness, Poster
Mentor(s): Mark Largent (James Madison College Dean)
After spending much time reading about how vaccines developed one question seemed to never be answered. If vaccines were developed for one purpose globally, why are the schedules different across the nations? The suggested schedule of vaccines varies dramatically in the U.S., Western and Eastern Europe. Our team decided we wanted to understand why there are differences in the schedules across the globe. Countries naturally have certain variations in the diseases endemic to their populations. We see however that where the similarities lie in the types of diseases that are being vaccinated against, the differences come from the various make-ups of the vaccines. We plan to discover which countries vaccines are more effective and why, by comparing immunization schedules for children ages 0-18 from the United States, Spain (a Western European nation), and Romania (an Eastern European nation).

TEACHING PEACE: CREATING AN ONLINE ARCHIVE IN TEACHING RESOURCES FOR PEACE AND JUSTICE STUDIES
Rebecca Farnum, Rayna Ketchum, Justin Lippi
Location: Lake Erie Room, 10:00 AM
Category: Social Science: General-Section 1, Oral
Mentor(s): Richard Peterson (Philosophy)
Peace and Justice Studies has recently gained prominence as an academic field of study. As an "academic discipline," though, peace and justice studies is hard to define. It is interdisciplinary in nature, drawing on nearly every social and natural science in addition to philosophy, literature, and religious studies. Because of this, teaching peace and justice studies at a university level presents an interesting dilemma. How can academic departments and units work together to create a cohesive program? In this project, we have worked with Professor Dick Peterson of the Philosophy Department to create an online teaching archive. The teaching archive works to collect materials on peace and justice education: sample syllabi, key texts, varying definitions of key concepts, and internship opportunities. We have worked to identify key concepts in peace and justice studies and how these concepts might be taught in different disciplinary settings. These concepts include peace, justice, symbolic violence, structural violence, direct violence, interpersonal violence, democracy, human rights, terrorism, reconciliation, conflict resolution, and freedom. We will present the concepts we have completed, the setup of the website we have created, and the ongoing possibilities for expansion.

BINDING OF ASCORBATE TO HISTAMINE RECEPTOR
Jenna Fewins
Location: Gold Room, 9:30 AM - 11:30 AM
Category: Biochemistry and Molecular Biology-Section 1, Poster
Mentor(s): Robert Root-Bernstein (Physiology)
A previous paper showed that ascorbate binds to a histamine receptor. This project focuses on ascorbate and the specific peptide sequences of the histamine receptor. A UV-vis spectrometer was used to measure the absorbance of ascorbate, histamine peptide receptor sequences, and ascorbate plus the histamine receptor peptide sequences. Measurements were taken over the course of three hours. Binding of ascorbate to the histamine receptor peptides preserves ascorbate's absorbance over time.

EFFECTS OF NEOLIBERAL APPROACHES TO DEVELOPMENT: THE CASE OF DYING TEXTILE INDUSTRIES IN MALAWI
Christina Field
Location: Tower Room, 11:15 AM
Category: History, Political Science, and Economics, Oral
Mentor(s): Rita Kiki Edozie (International Relations)
In the past 60 years, billions of dollars in aid have been pumped into third world nations around the globe with a lack of benefit. My research looks at neoliberal policies for development, specifically in Malawi in the form of imported secondhand clothes. While I have seen first-hand such systems in play in Africa, I have researched various scholarly views from development theorists. While American economist Jeffrey Sachs suggests increasing aid to poorer countries, Zambian economist Dambisa Moyo shows ways aid can be counter effective. Moyo argues aid can harm a society in several ways, including killing entrepreneurship of the local population. My work discusses concepts of development, neoliberalism, modernization, and aid. I examine distribution of importing clothes, Africans who sell the clothes, U.S. policy that had worked to erect textile industries a decade ago, how the industries are dying, and negative impacts this has on entrepreneurship in Malawi. Malawi used to manufacture and export its own textiles which created jobs, more self-reliance, and expanded the economy. With importation of secondhand clothes, though, Malawi lost jobs because imports were cheaper, the government lost revenue from ceasing to export goods, and created a form of dependency on foreign sources. My work shows some negative effects of neoliberal aid policy, looking particularly at the dying textile industry in Malawi as a result of imported secondhand clothes, and ultimately leads us to rethink the role of international aid.

DISINFECTION OF HUMAN ADENOVIRUS CONTAMINATED WATER USING A NOVEL POINT-OF-USE DEVICE CONTAINING BROMINATED RESIN BEADS
Matthew Field
Location: Ballroom, 1:30 PM - 3:30 PM
Category: Microbiology, Immunology, and Infectious Disease-Section 4, Poster
Mentor(s): Angela Coulliette (Fisheries and Wildlife), Joan Rose (Fisheries and Wildlife)
Contaminated water causing diarrheal diseases results in an estimated 1.9 million deaths in children in developing countries every year. Many of these diseases are caused by viral agents such as rotavirus, and emerging astrovirus and adenovirus, which are transmitted via the fecal-oral route by contaminated food or water. Enteric adenovirus serotypes 40/41 are detected in 26-31% of the diarrheal infections in developing countries. Household water treatment at the point-of-use is one approach to reduce exposure to human enteric pathogens but little research

has been dedicated to virus removal. A novel gravity fed household water disinfection system using bromine resin bead canisters that consist of poly[1,2-dibromo-5-methyl-5-(4'vinylphenyl)-hydrantoin is being evaluated for its effectiveness in reducing adenovirus concentrations. The bromine canisters are being challenged with well-water seeded with 10% sewage contamination to represent pollution levels and human adenovirus serotype 2 (HAdV2), as a valid proxy for human adenovirus serotypes 40/41. Preliminary data based upon cell culture infectivity for seeded well-water showed no reduction for HAdV2 in the first volume of water produced at the 5 minute time-point where the flow rate was 620 ml per minute with a residual of 0.225 mg/L. A reduction of 0.25 $\log_{10}$ Most-Probable-Number (MPN) per ml was detected for both 15 and 20 minute time-points where the flow rates were 350 ml and 113 ml per minute, respectively with residuals of 0.225 mg/L. Previous work on bacteriophage suggested that the system could remove high levels of viruses. This study suggests that with polluted waters, efficacy cannot be guaranteed.

SELF-REGULATION IN RELATION TO TEMPERAMENT AND GENDER DIFFERENCES IN PRESCHOOL
Angela Finkbeiner, Allison Dovi
Location: Ballroom, 9:30 AM - 11:30 AM
Category: Psychology-Section 2, Poster
Mentor(s): Lori Skibbe (Family and Child Ecology)
The current study examined gender differences in self-regulation during preschool and its relation to children's temperament. Self-regulation is an important indicator of school readiness (Rimm-Kaufman, Pianta, & Cox, 2000). Previous research (Matthews, Ponitz, & Morrison, 2009) has revealed gender differences in self-regulation in both the fall and spring of kindergarten, but it is unclear whether this is also true in preschool. In addition, temperament may be related to children's self-regulation (Davis, Chang & Burns, 2006). Effortful control includes capacities for inhibitory control, and attention control, which are theoretically related to self-regulation. In this study, we examined how self regulation develops during preschool, whether boys and girls exhibit different self-regulation during the school year and if self-regulation relates to preschoolers' temperament. Preschool children (n = 100) were assessed directly on their self-regulation using the Head Toes Knees Shoulders (HTKS) assessment at four time points during the school year. Parents filled out information on children's temperament, using the Children's Behavior Questionnaire (CBQ), which measures surgency, negative affect, and effortful control. Results showed that self regulation grew throughout the school year (i.e., from 10.55 (SD = 12.81) in the fall to 22.98 (SD = 15.15) in the spring), but there were no gender differences. Self regulation was significantly related to children's effortful control (r = .31, p = .01), but not to surgency (r= .12, p=.30) or negative affect (r= -.109, p= .33) in the fall. Self-regulation develops during preschool without gender differences and is positively related to preschoolers' effortful control.

ARABS, JEWS, & THE NEWS: THE WEBSITE
Alyssa Firth, Clarissa Church, Dennis Vlahoulis
Location: Lake Superior Room, 1:15 PM
Category: Communication Arts and Sciences, Oral
Mentor(s): Robert Albers (TISM), Geri Alumit-Zeldes (Journalism)
The "Arabs, Jews, & the News" Web site is an extension of the documentary it promotes. The Web site updates news of the film, as well as houses used and unused materials and new video clips created by students. Produced by Geri Alumit Zeldes and directed by Robert Albers, the film is enjoying recent success, some attributed to the promotional features of the site. For example, the documentary nearly received a "People Choice Award" when it almost garnered enough online votes generated by social networking updates on sites, such as Twitter and Facebook. Dennis, head of public relations for the documentary, searches and submits the film to movie festivals. He also contacts other schools and colleges in order to promote the film. Alyssa, the site's content manager, posts documentary news. She also uploads photos and media content to the site, including thematic videos relating to the documentary. Both Alyssa and Clarissa edit down content and put together the videos for the site. All three students meet weekly with Albers and Zeldes to discuss the Web site and new ways to promote the film.

COMPARING TWO-DIMENSIONAL REGIONS OF INTEREST AND TRACTOGRAPHY METHODOLOGIES FOR FRACTIONAL ANISOTROPY MEASUREMENTS FROM DIFFUSION TENSOR IMAGING ACROSS FORNIX AND CINGULUM TRACTS
D. Luke Fischer
Location: Ballroom, 1:30 PM - 3:30 PM
Category: Psychology-Section 3, Poster
Mentor(s): Andrea C Bozoki (Neurology and Ophthalmology)
Diffusion tensor imaging (DTI) is a non-invasive magnetic resonance (MR) technique that measures water diffusion in anisotropic tissues to indicate the underlying tissue's microstructure. DTI is useful for comparing white matter composition, location or integrity, allowing research on brain trauma or neurodegenerative diseases like multiple sclerosis, HIV or Alzheimer's disease (AD). Fractional anisotropy (FA) is a scalar measure from DTI that describes the degree of anisotropy within a given voxel. Region of interest (ROI) analysis is often used to measure FA by placing two-dimensional boundaries on a planar region within a tract and averaging the selected voxels. A newer method based on tractography measures the FA for chosen fiber tracts for an entire structure's average. The methodologies of ROI and tractography were compared using FA measurements from the fornix and sections of the cingulum across a dataset of 60 subjects who were normal, had mild cognitive impairment (MCI) or had early AD. ROI fornix FA was 0.3542 versus 0.2889 from tractography; ROI cingulum FA was 0.4362 and for tractography based, 0.3570. ROIs that were easier to place correlated well with the tractography measures, but harder to place ROIs did not. Across all structures measured, a paired sample t-test showed a significant difference between the two methodologies (fornix t-value, 8.162; cingulum, 13.420). With a much smaller standard deviation, tractography is the more precise method, and for hard to discern structures, it is the recommended method for more precisely measuring FA.

SHARK BYTES? SHARKS IN THE MEDIA
Lisa Fishbeck
Location: Ballroom, 9:30 AM - 11:30 AM
Category: Environmental and Natural Resources-Section 1, Poster
Mentor(s): Meredith Gore (Fisheries and Wildlife)
Shark populations have plummeted between 70 and 90 percent worldwide in the past 20 to 30 years as a result of direct and indirect interactions with humans. Examples of human-related threats to sharks include: shark finning, bycatch, trophy fishing, oceanic pollution, coastal development, and a negative public image. Shark conservation efforts have been limited due to the negative attitudes that the public associates with sharks. Mass media is often blamed for perpetuating negative images of, and misconceptions about, sharks. The purpose of this study was to explore how sharks (Chondrichthyes) are portrayed in popular news media. Our objectives were to characterize U.S. news coverage about sharks from 2000 to 2010 and evaluate the conservation and risk frames of news media coverage of sharks. We conducted a media content analysis of 150 newspaper articles published in major U.S. publications (e.g., New York Times, USA Today, Houston Chronicle, etc.). We reviewed each article for information about threats from sharks (e.g., shark attacks), threats to sharks (e.g., poaching, beach meshing, etc.), natural history (e.g., shark biology and ecology) and other conservation-related information. We address a variety of questions related to the frequency and type of coverage, as well as media framing. This work is being replicated in Australia by shark ecologists at the Marine Environment and Ecology Program at SARDI Aquatic Sciences in Adelaide. Results from this work will inform the human dimensions of global shark conservation as well as shark conservation policy.

CHARACTERIZATION OF THE NEISSERIA GONORRHOEAE MUTANT M0177
Ainslee Flavell
Location: Ballroom, 9:30 AM - 11:30 AM
Category: Microbiology, Immunology, and Infectious Disease-Section 2, Poster
Mentor(s): Cindy Arvidson (Microbiology and Molecular Genetics)
The human pathogen, Neisseria gonorrhoeae, causes the sexually transmitted disease, gonorrhea. The initial step of a gonococcal infection is attachment to epithelial cells via a type IV pilus. My project has been to characterize the strain M0177, which contains a mutation in a putative regulatory locus, NG0177. M0177 has been found to have decreased adherence to cells in culture. To determine the cause of decreased adherence, I am analyzing the pilE gene, which encodes pilin, the major subunit of the pilus. The pilE locus of M0177 and the wildtype parent strain, MS11 was PCR amplified using two different sets of primers: one that amplifies the entire pilE gene and another that amplifies a smaller part of the gene. My goal is to establish whether the reduced adherence of M0177 compared to MS11 is due to a mutation in the pilE gene or due to the mutation of the NG0177 locus. Should there be no difference in the pilE genes of the two strains, I will then further characterize M0177 to determine the mechanism by which the decreased adherence occurs.

EFFECT OF MOSQUITO LARVAE COMPETITION ON TREEHOLE MICROBIAL COMMUNITIES
Fatima Foflonker
Location: Ballroom, 9:30 AM - 11:30 AM
Category: Microbiology, Immunology, and Infectious Disease-Section 1, Poster
Mentor(s): Michael Kaufman (Entomology), Edward Walker (Microbiology)
Larvae of the disease vector, Aedes triseriatus, develop in small container habitats such as tree holes. In Michigan and elsewhere in the U.S., an invasive species of mosquito, Aedes japonicus, is establishing in larval Ae. triseriatus habitats. The microbial community in these habitats transforms organic matter input (e.g., leaf material) into the primary food for larvae --microbial biomass. Competition over food resources between larval species may affect adult mosquito emergence rates and disease transmission, but changes in the microbial community food base have not been examined in this context. This experiment simulated tree hole habitats by using microcosms consisting of 300 mL of water and 1 gram of whole leaves, and were incubated at 25°C. Four treatments were used: no larvae, 30 Ae. triseriatus larvae, 30 Ae. japonicas larvae, and a mixture of 15 Ae. triseriatus and 15 Ae. japonicas. Microcosms were checked daily for mosquito emergence. Leaf and water samples were collected after 10 days. Samples were analyzed using DAPI fluorescent microscopy to count the bacterial community. Counts indicate that that there was a significant decrease in bacteria when both species were present compared to the absence of larvae. Microbial community analysis using TRFLP techniques also indicated that the presence of both species significantly altered the fungal community. The results suggest that when two competing species are present, they put greater pressure on their microbial food resources. This has implications for mosquito production and disease transmission in areas where the two species colonize the same breeding sites.

MICROBIOLOGY AND MOLECULAR GENETICS
Evan Frank
Location: Ballroom, 1:30 PM - 3:30 PM
Category: Microbiology, Immunology, and Infectious Disease-Section 3, Poster
Mentor(s): Norbert Kaminski (Pharmacology/Toxicology)
The overall goal of this research is to engineer an *in vitro* model for Cytotoxic T lymphocyte (CTL) elicitation and recall. CD8+ T cells differentiate into effector CTL after antigen encounter and are important effector cells in tumor and antiviral immune responses. Dendritic cells are the most potent antigen presenting cells and are critical in T cell elicitation (including CTL). This effort has focused on the transgene expression of viral influenza protein PB1 (a viral RNA polymerase) in murine DC2.4 dendritic-like cells and EL4 target T cells. To construct the model, DC2.4 and EL4 cells were transduced using Applied Biosystems pLex lentiviral gene vectors. Proof of principle experiments were performed in DC2.4 transduced with green fluorescent protein (GFP), which is easily visualized. *In vitro*, specificity of CTL responses to GFP was observed in splenocytes (a source of $CD8^+$ T cells) elicited against DC2.4-GFP cells and assayed in ^{51}Cr CTL assay, IFNγ ELISPOT and flow cytometry for IFNγ, IL-2, TNFα. Recent efforts have focused on obtaining PB1-expressing clones by selection of puromycin and neomycin resistance and single-cell dilution cloning. This model will be used to study the effects of Δ^9-Tetrahydrocannabinol, an immunosuppressive cannabinoid compound, on the elicitation of CTL in response to viral proteins such as PB1.

LANSING, LANGUAGE, AND LIFE
Katherine Fraser
Location: Gold Room, 9:30 AM - 11:30 AM
Category: Social Science: General-Section 1, Poster
Mentor(s): Jan Anderssen (Linguistics), Suzanne Wagner (Linguistics)
The Northern Cities Shift (NCS) is a change in the pronunciation of vowels, affecting speakers in the Midwest. To speakers outside the dialect, the change is recognizable by "Ann" sounding like "Ian" or "block" sounding like "black". Sociolinguistic studies have found that dialectal changes are not homogeneous but that different populations are affected differently, influenced by factors such as race, gender, and age. Apart from dialect perception research and a few general studies on the NCS in Michigan, there has been no previous, detailed, sociolinguistic work on Lansing. Linguists have instead focused on populations in nearby towns, such as Detroit, Ypsilanti, and Mount Pleasant. My study set out to investigate a group of speakers from Lansing, and to find out whether they are participating in this shift. In particular, I chose to study the elderly population because it would represent the earliest stages of the shift in Lansing. My participants were three white women, aged 70-90, residents of the Eastside neighborhood, whom I recorded in sociolinguistic interviews. The vowels of each speaker will be extracted and measured, in order to see if they have shifted to the position of other speakers participating in the NCS. Once the data analysis is completed, I will find out whether the subjects are shifting their vowels. If they are, this would lay groundwork for comparison of younger speakers. If the elderly have shifted, this would indicate Lansing is part of the NCS, an important discovery for mapping out the vowel shift.

DUDES AND DUDETTES USING "DUDE"
Katherine Fraser
Location: Gold Room, 1:30 PM - 3:30 PM
Category: Social Science: General-Section 3, Poster
Mentor(s): Jan Anderssen (Linguistics), Suzanne Wagner (Linguistics)
While the stereotypical "dude" user is a male stoner or surfer, in recent years it seems that the word has begun to lose that stigma, particularly in a college setting. This study examined the use of "dude" in university students: how it varies between social groups and in different situations. The only prior research on the topic was done by Kiesling (2004), who looked to define what isverb tense the appropriate context for saying "dude".This project intended to expand on that question, to include how social network can suppress or motivate one's use of the word. For this study, I entered the communities of two residence halls, Holmes Hall and Wonders Hall, characterized as home to "jocks" and "science nerds", respectively. Over a semester long interval, I recorded observations in the cafeterias, noting speech, social connections, and identity features of the students. I hypothesized that females nerds, particularly when talking to each other, are saying "dude" more than they have previously. Because nerds are less motivated to act "girly", they often reject the linguistic trends followed by the jocks (Bucholtz 1996, Eckert 1989). The study gave insight into how different the two social networks in many aspects of identity formation, except in the use of "dude". The results suggested that speakers are transcending the stereotype; a "dude" user can be a jock, nerd, or even a girl.

REINVENTING WRITING WITH MEDIA
Benjamin Froese
Location: Tower Room, 1:45 PM
Category: Education, Oral
Mentor(s): Bump Halbritter (Writing, Rhetoric, and American Cultures.)
In WRA 417 a year ago, five class members and I were asked to engage a multimedia project of our choosing. We decided to go to Old Town Lansing and document the life of Robert Busby, through the testimonies of his friends and family, and the artifacts he left behind. What we didn't realize at the time was that by simultaneously engaging invention, research, performance, creation, and collaboration we were redefining how writing is experienced as a student. We were all inexperienced with cameras and microphones, but our dedication to the subject catapulted us into an environment where we could learn by doing. Our perception of how writing is taught and engaged is now facing a phase of metamorphosis- our experience is a valuable addition to this discussion.

LOCATING MSU'S HISTORY: MAPPING ARCHAEOLOGICAL RESOURCES ON CAMPUS
Jeff Gepper
Location: Gold Room, 1:30 PM - 3:30 PM
Category: Social Science: General-Section 2, Poster
Mentor(s): Lynne Goldstein (Anthropology)
This poster focuses on the need to locate and protect MSU's archaeological resources. Michigan State's campus is constantly changing to keep pace with the evolving needs of its community, but this often means that the archaeological evidence of the University's past is being unknowingly disturbed. To minimize these effects, the Campus Archaeology Program has worked with MSU's Physical Plant to create a map illustrating the documented locations of building razed throughout MSU's past 150 years. We have used archival campus maps and Geographic Information Systems to combine the historic campus with the digital inventory of existing buildings known as the Munsys system. Our new map will allow the Campus Archaeology Program, MSU, and construction crews to easily identify locations in which the University's historic foundations may still exist.

THE EFFECTS OF SOCIAL IDENTITY AND COMPETITION ON STUDENT MOTIVATION TO PARTICIPATE IN ALTRUISTIC CAUSES
Rebecca Gidley
Location: Ballroom, 9:30 AM - 11:30 AM
Category: Communication Arts and Sciences, Poster
Mentor(s): Sandi Smith (Communication), Wilma Wibert (Communication)
Researchers today continue to seek insight into what motivates young adults to participate in altruistic causes. Social Identity Theory hypothesizes that the more people associate themselves with a group (e.g. an institution), the more likely they are to volunteer for a cause that associates itself with that group. This study hypothesizes that in-group identification can heighten participation in certain types of campaigns.

In order to test this hypothesis, two surveys were distributed in the fall of 2009 to 137 Michigan State University students; one included an ad with the Michigan State logo the other did not include the ad. The survey asked questions about in-group social identity for MSU; out-group social identity for a rival institution; outcome measure questions about how much time students were willing to volunteer, amount of money they were willing to donate, and the number of friends they would recruit for the cause; and basic demographic questions. The results of this study, which are forthcoming, will provide an understanding of the effect of in-group identification and competition on participation in altruistic causes.

ATOMIC RESOLUTION STRUCTURAL STUDIES OF THE COP9 SIGNALOSOME
April Giles, Lauren Grenzicki
Location: Parlor B, 9:45 AM
Category: Cell Biology, Genetics, and Genomics, Oral
Mentor(s): William Henry (Biochemistry)
The COP9 signalosome is an eight subunit complex whose members are conserved among eukaryotes. While its exact function is not fully understood, COP9 has been found to govern both proteolysis in early development and pathways linked to cancer in humans, including those involving the tumor suppressor p53. Collaboration with the Arnosti lab led to the discovery of COP9 as a co-regulator of the Retinoblastoma tumor suppressor family via direct interactions with the two Drosophila melanogaster RB homologs, Rbf1 and Rbf2. Decrease in the levels of COP9 resulted in the degradation of Rbf1 and Rbf2, decreasing transcriptional control of oncogenes controlling cellular proliferation. Deregulating this process directly results in a higher incidence of cancer. A hypothesis was proposed that COP9 naturally protects RB proteins from proteasome-mediated destruction to facilitate cell-cycle control during differentiation. Our current project aims to determine the structure and therefore function of the individual COP9 signalosome subunits. We have plasmid constructs of all eight subunits from both Homo sapiens and Drosophila melanogaster and are working on developing protocols for large-scale expression and purification of all subunits from each organism in order to set up crystallization screens. Once crystals are obtained, we will study the atomic resolution structure via X-ray crystallography to discover the structural features of the domains that interact with RB and p53. Knowledge of COP9 interactions with p53 and RB provides valuable insight into the tumor suppressor degradation pathways in various cancers and therefore furthers progress in the area of cancer prevention and treatment.

PREVENTION OF COLITIS AND COLORECTAL CANCER USING A COMMERCIAL PREBIOTIC GALACTOOLIGOSACCHARIDE AND ITS EFFECT IN INTESTINAL MICROFLORA
Anita Gopalakrishnan
Location: Ballroom, 1:30 PM - 3:30 PM
Category: Agriculture and Animal Science, Poster
Mentor(s): Jenifer Fenton (Food Science and Human Nutrition)
Diet is hypothesized to play an important role in cancer prevention by reducing inflammation. Inflammatory Bowel Disease (IBD) is an important risk factor for colon cancer; however, its etiology is poorly understood. Recent studies suggest that intestinal microflora benefit the host by improving microbial balance and inhibiting the growth of pathogens. The objective of this study was to determine the effects of the prebiotic, galactooligosaccharides (GOS) on microfloral populations within the gastrointestinal (GI) tract and the reduction of IBD. A SMAD 3-/- mouse model of colitis was utilized. Four weeks after gastric intubation of H. Hepaticus, the SMAD3 -/- mice develop colitis. In this study, mice were gavaged with 5000mg GOS/ kg body weight daily for a period of 2 weeks to determine changes in lymphocytic and microfloral populations in the gut. Mice were orally supplemented with GOS for 14 days prior to infection with H.hepaticus and continued to be supplemented post infection. Spleen, peyers patches, and mesenteric lymph nodes were excised for analysis by flow cytometry and colon and cecum samples were collected for histopathology. Fecal samples were collected at 3, 7, and 14 days and were used to quantify Lactobacilli and Bifidobacteria in the colon via Real Time PCR. We assessed whether GOS supplementation reduced the severity of H.hepaticus induced colitis in mice. The H.hepaticus + GOS mice displayed a lower colitis score when compared to the unsupplemented H.hepaticus mice. Data obtained from this study suggests that GOS supplementation can reduce colitis and may prevent tumor formation.

DIASPORIC WOES OF TECHNOLOGY: INTERNET POLITICS AND ZAINICHI RESIDENT KOREAN IDENTITY
Shane Graves
Location: Lake Erie Room, 2:15 PM
Category: Social Science: General-Section 2, Oral
Mentor(s): Catherine Ryu (Linguistics)
This project investigates the role of the Internet in identity politics as it pertains to “zainichi” Resident Korean identity both within this diasporic community in Japan and Japanese society at large. Specifically, this study investigates the nature of the impact this process has on the lives of individuals from this community. Historically, Resident Koreans in Japan have faced discrimination as an underprivileged minority in a nation that touts its ethnic and cultural homogeneity. A large portion of this diasporic community comfortably assimilates to Japanese society by minimizing or keeping their heritage a secret. With the digitization of information, the Internet has intensified exchanges of “zainichi”-related issues beyond national borders and at a rapid pace. Part of this process includes exposure of individual “zainichi” identity that was beforehand predominately unknown to the larger public. Such involuntary exposure is demonstrated to have varying effects for the individuals and entire community at large. Many of the undesired effects include the repercussions that come as a result of being identified, which include heightened racism through comments spread virally across the Internet. Hence, this study also examines the qualitative difference between involuntary exposure and the facility of the Internet in expanding polarizing dialogue about known Resident Koreans. Ultimately, this project ruminates on urgent issues of how to effectively address the viral nature of how Internet social media sites facilitate the spread of racism against “zainichi” Resident Koreans.

PUT A LABEL ON IT: USING MULTIMEDIA TO INCREASE UNDERSTANDING BETWEEN FARM MARKET VENDORS AND SHOPPERS
Alisha Green
Location: Green Room, 10:45 AM
Category: Digital Media-Section 1, Oral
Mentor(s): Bonnie Bucqueroux (Journalism)
Farm markets have been growing in popularity for several years in the U.S. along with the movement for finding organic or sustainably grown food. Food grown locally often fits the organic or sustainable label, so people flock to farm markets for these trendy foods that are touted as being environmentally friendly and healthier for the consumer. Few people know what these labels actually mean, and some farm markets provide this information for consumers while others are more lax. Interviews with vendors at four mid-Michigan farm markets showed they are all eager to provide labels to better connect with shoppers and inform people about food. These video interviews were posted in the Catering to Cultures section of the Web site Sustainable Farmer, which serves a community of people interested in sustainable agriculture and includes farmers who need information about how to best prepare for the growing farm market business. The research provides shoppers with information on how to make sure they are buying the type of food that they want --whether it is homegrown, sustainable, organic, or any other category. The UURAF project focuses on giving farm market vendors information on how to best cater to an audience with a diverse range of knowledge about what is available, but it also gives shoppers the information they need to make smart decisions beyond buying something with a trendy label. These dual goals are accomplished with video packages that can easily be shared through the Internet.

EXPLORATION OF ALGAL SYSTEMS FOR NOVEL HYDROGENASES
Robin Green
Location: Gold Room, 9:30 AM - 11:30 AM
Category: Biochemistry and Molecular Biology-Section 1, Poster
Mentor(s): Eric Hegg (Biochemistry and Molecular Biology)
The ever increasing demand for an alternative energy source warrants the exploration of any possible source that could ameliorate this problem. A very exciting field of research involves the investigation of extremeophillic organisms as potential 'biological factories' for alternative fuels. Currently I am actively investigating two such organisms as potential novel organisms for the study of hydrogenases, enzymes that catalyze the reversible reduction of protons to hydrogen gas. Half of my project involves the investigation of Galdieria sulphuraria, a thermophilic, acidophilic alga that has been shown to have a gene with high sequence similarity to a known hydrogenase at several amino acid residues believed to be important for hydrogenase activity. I believe that the isolation and manipulation of the gene of interest at corresponding areas for different protein residues could provide better understanding of hydrogenase activity. I am also investigating Volvox carteri, a multicellular chlorophyte alga. This organism is very closely related to Chlamydomonas reinhardtii, an organism that has been demonstrated to have hydrogen metabolism. Analysis of the Volvox carteri genome has shown two genes that could be potential homologues to the two hydrogenases found in Chlamydomonas reinhardtii. Due to the close sequence similarity of these two organisms, I believe that these two genes could be potential hydrogenease. Preliminary in vivo hydrogen assays have demonstrated hydrogen metabolism in Volvox carteri, providing convincing evidence that these two genes are indeed both homologous and analogous between the two above organisms.

STUDY OF SIGNAL TRANSDUCTION COMPONENTS INVOLVED IN JASMONATE HORMONE ACTION IN ARABIDOPSIS THALIANA
Alandra Greenlee
Location: Ballroom, 9:30 AM - 11:30 AM
Category: Microbiology, Immunology, and Infectious Disease-Section 1, Poster
Mentor(s): Sheng Yang He (Plant Biology)
My research aims at determining the interaction between crucial plant hormones, Jasmonates (JAs), and their transcriptional repressors, Jasmonate ZIM-domains (JAZs). JAs play an essential role in plant development and defense mechanisms against pathogens. To determine the specific relationship between these hormones and plant defense mechansims, a focus has been placed on several of the JAZ proteins. Through determination of the genetic product of these hormone interactions, it will be possible to better comprehend the association between JAs, JAZs and pathogenic defense mechanisms. Using a Yeast Two-Hybrid system, yeast colonies were screened and samples with a specific interaction between the transcription factors (TFs) and JAZ proteins were isolated. The genes encoded by these TFs were determined and their role in plant defense mechanisms were studied in Arabidopsis thaliana. In my presentation, I will introduce my results from this study. This work will demonstrate the relationship between JAs, JAZ proteins, and pathogen defense mechanisms. Through the study of JAs and JAZ proteins, it may be possible to develop more effective agricultural techniques to avoid plant diseases and increase agricultural yield.

PERFORMING THE SILK ROAD: CHINA AND THE 2008 BEIJING OLYMPICS
Amanda Greer
Location: Lake Huron Room, 10:30 AM
Category: Humanities and Peforming Arts-Section 1, Oral
Mentor(s): Catherine Ryu (Linguistics)
This research analyzes the Silk Road portion of the 2008 Beijing Olympics Opening Ceremony as an example of how China constructs and performs its national identity to the global audience. The opening ceremony of the Summer Olympics in Beijing combine both old and new aspects of Chinese culture, and include many items, such as dance, music, and fashion trends that would have been found along the Silk Road over a hundred years ago, and some that can also be found on the Silk Road today. Specifically, it will investigate how contemporary China constructs its national identity by incorporating the images used to represent the Silk Road, images that are readily recognized and appreciated by the rest of the world. I'll examine various components of the Opening Ceremony and show how the Silk Road fits into our understanding of cultural Chinese legacy as well as into global heritage, which can be shown by analyzing both modern and older photographs taken along the Silk Road. This project is ultimately an assessment of China's self-representation to the world audience and the ways in which it's able to perform its own national identity by using references to the Silk Road in their Opening Ceremony.

INVESTIGATION OF THE ROLES OF SPITTLEBUGS, CANKERS, STEM DENSITY AND GROUND WATER IN BRANCH DIEBACK AND MORTALITY IN REGENERATING WHITE PINE

Rachel Griesmer

Location: Ballroom, 9:30 AM - 11:30 AM

Category: Environmental and Natural Resources-Section 1, Poster

Mentor(s): Gerry Adams (Plant Biology)

Regeneration of white pine is managed with crowded planting to discourage white pine weevils and to obtain straight stems following destruction of terminal leaders. Dieback and limited mortality were observed in these stands in the Au Sable and Manistee river corridors in 2006-2009. Regeneration is threatened in one of the only areas in Michigan with virgin white pine forests. Disease symptoms, previously unrecorded in Michigan, included tip dieback and branch death due to canker girdling with occasional tree mortality from running cankers. Preliminary investigations suggested the disease is a decline syndrome of complex biotic and abiotic origin. We developed the hypothesis that two predisposing factors, high stem density and lower ground water, increased susceptibility to an inciting factor-a spittlebug epidemic. The inciting factor caused a further progression in stress which was allowing a contributing factor-a fungal canker pathogen, to assert itself. Branch samples were collected from replicated plots established in Crawford County, Michigan. Fungi were isolated from cankers and identified via microscopy and DNA sequence of ribosomal DNA regions. Initial observations of Pine spittlebugs in the field were followed by quantification of feeding scars to assess their impact. Additionally, field estimates of basal area were conducted. Further investigation of climate data, particularly ground water levels and co-inoculation trials with spittlebug and pathogenic fungi are discussed. We integrated all factors into diagnosis of the decline and offer new guidelines stem density management in regenerating white pine in Crawford County.

EXAMINING ELEMENTARY AND MIDDLE SCHOOL STUDENTS' LEARNING AROUND GENETICS INHERITANCE

Amanda Griffin, Elizabeth Bartos, Andrew Krause

Location: Gold Room, 1:30 PM - 3:30 PM

Category: Education-Section 2, Poster

Mentor(s): Michelle Williams (Teacher Education)

This poster will focus on how upper-elementary and middle school students develop coherent understandings of a complex science topic, genetics inheritance, within and across grade levels using a Web-based Inquiry Science Environment (WISE). Identical pre- and post content-assessment items were administered to approximately 385 students in grades 5 and 7 before and after instruction. Each content assessment was used as a pre- post measure to gather information about changes in students' knowledge of genetics inheritance and ability to integrate knowledge in explanations. Some of the items on the assessments were the same for both grades and others were unique to each assessment. The WISE instructional materials were centered on several target concepts related to genetics inheritance, namely cells, reproduction, and heredity. We used item response theory, or IRT, to examine students' performance on linked items across these two grades. Overall, students performed significantly well from the pre- to post-content assessment within each grade. Across grades, it is important to note that 5th-graders' performance on the posttest equaled that of the 7th-graders. We posit that this could primarily be attributed to the fact that 5th-graders were provided with instruction in foundational concepts, such as inherited and acquired traits, which are important to the development of students' understanding of the mechanisms of inheritance. This may have allowed fifth-graders to develop a more integrated understanding of the target concepts.

WHEN WINNING ISN'T EVERYTHING: THE MODERATING EFFECTS OF SOCIAL OSTRACISM ON COOPERATION

Kevin Guenther, Allison McCarthy, Huma Moulvi

Location: Ballroom, 9:30 AM - 11:30 AM

Category: Psychology-Section 1, Poster

Mentor(s): Cary Roseth (CEPSE)

Successfully attaining cooperative goals typically enhances psychological health and increases interpersonal attraction. Social ostracism --or ignoring or excluding --may undermine these effects however, even when groups successfully attain their goal. Using a 2 (ostracism, inclusion) x 3 (cooperative, cooperative with intergroup competition, unspecified) x 2 (success, failure) between-subjects design, 125 randomly assigned undergraduates played "Cyberball," a 3-player internet game in which participants toss a ball back-and-forth with two computer-generated confederates. As expected, under the ostracized condition results showed reduced levels of self esteem, control, meaningful existence and mood, as well as lower levels of liking for teammates. Importantly, ostracism's effects remained even under conditions of successful cooperative goal attainment (e.g., throwing the ball 30 times or throwing more times than a competing team).

CHILDREN'S COMPREHENSION OF SIMPLE AND COMPOUND COMPARATIVES

Ashley Hall, Jessica Lee, Alexandra Rodebach

Location: Ballroom, 9:30 AM - 11:30 AM

Category: Psychology-Section 2, Poster

Mentor(s): Alan Munn (Linguistics), Cristina Schmitt (Linguistics)

The goal of this study is to further understand how children acquire the knowledge of comparatives. In this experiment a number of simple comparative and compound comparative questions were asked to children using three different sets of cards. On each card there were four objects of varying height. Objects included trees, buildings and people. An example of a simple comparative is "John is taller than Sally." In this case, John does not necessarily have to be 'tall'; he just must be taller than the reference point, who is Sally. An example of a compound comparative is "John is taller than Sally, but shorter than Bill." With this type of comparative, individuals must comprehend the relative height of John in comparison to two reference points. We hypothesize that the comprehension of comparative relationships will increase with age. Furthermore, children will understand simple comparatives better than compound comparatives.

THE MOST CHANGED BUILDING ON MSU'S CAMPUS: A STUDY OF MICHIGAN STATE'S OLDEST BUILDINGS
Mary Hall
Location: Ballroom, 1:30 PM - 3:30 PM
Category: History, Political Science, and Economics, Poster
Mentor(s): Michael Velbel (Geological Sciences)
My project addresses the fact that many students, while they love this campus, do not know much about it. They know that MSU has a great history and many old buildings, but many are unaware of how much change has actually occurred on campus. To address this issue, my project presents information on the most changed building on campus in an interesting way, in order to spread knowledge about our great campus. I focused on some of the oldest buildings on campus, like Eustace-Cole Hall, Marshall Adams Hall, Linton Hall, and Morrill Hall to answer the question of what kind of changes occurred (like renovations and additions), and how they affected the buildings. I have researched the history of these buildings by examining historical documents from the archives, by reading about MSU history in books, and on the internet in order to find the most changed building on campus. My presentation will show the total changes of each of the buildings, and then I will explain which building I have labeled as "most changed" and why. The research about the most changed building on campus will expand students' knowledge of our campus, forming a tighter bond and a better relationship between the student and the university.

CURRIED CALLALOO: INDIAN
Samina Hamidi
Location: Lake Superior Room, 9:30 AM
Category: Social Science: General-Section 3, Oral
Mentor(s): Jualynne Dodson (Sociology)
The emerging study of the African Diaspora has become more visible in academia over the past decade. In a similar fashion, this has also raised critical issues among communities who have experienced involuntary and semi-voluntary movements. The East Indian is such a Diasporic community that is receiving increased attention among scholars. This paper will explore aspects related to a portion of the Indian Diaspora inside of the Caribbean. This research focuses on the migration of East Indians to Trinidad in the 19th century and their life experiences during indentureship in the Caribbean. This research will investigate when this migration began, what stimulated the importation of East Indians, and what East Indian laborers encountered with the established populations present on the island upon their importation. With the examination of primary and secondary sources, this paper will report on the conditions of East Indian influence and labor inside of Trinidad.

WOMEN EXECUTIVES IN THE RETAIL INDUSTRY: IS THERE A GLASS CEILING?
Laura Hammer
Location: Ballroom, 9:30 AM - 11:30 AM
Category: Communication Arts and Sciences, Poster
Mentor(s): Patricia Huddleston (Retailing)
The retail industry has the highest involvement of female employees and customers throughout the world, with over 60% of employees being women. However, much of women's employment in the industry is in lower-level positions. The purpose of our study is to examine whether a glass ceiling exists for women in the retail industry and to what extent women occupy higher management positions. To study this topic we have examined the top management of the top 250 global retail companies. Using Deloitte's annual report, Global Powers of Retailing 2009, Hoovers Company Records, and company annual reports and websites, we have compiled a database of the retailers including company sales, countries of origin and operation, operating formats, number of women executives, and executive positions held by women. We analyzed the data to compute a percentage of women executives in each company, and a total percentage of females in each position. We were able to gather information about 248/250 companies. We found that 74% of the 248 companies have at least one woman present in their top management team, and approximately 9% had a female chief executive officer compared to the business industry's average of 3%. Our findings bring to light the little presence women have in top management of the industry. Hopefully, these findings will motivate an evaluation of hiring and training practices in retailing and steps will be taken to increase progression of women into executive positions.

CIVICALLY AND POLITICALLY ENGAGED STUDENTS IN MICHIGAN
LaShawn Hanes
Location: Tower Room, 3:00 PM
Category: Education, Oral
Mentor(s): Rebecca Jacobsen (Education)
This project extends from my research assistance for Dr. Rebecca Jacobsen and her research "School Racial Context and Student Civic and Political Engagement." The research addresses the overall understanding of what are student's conceptions of being a good citizen and does this vary based on the school structure and curricula. I am intrigued with active participation in the community; therefore, I have developed questions that address what it means to be a good citizen and how students practice those qualities. This research is critical because it is important to understand if students who are approaching adulthood are knowledgeable on what it takes to sustain and improve their communities through active and engaged citizenship. The data used in this research comes from verbal interviews and written responses given by students and faculty of various diverse Michigan high schools. In my oral presentation I will present the results of interviews in an effort to answer the questions, "What are Michigan high school students' conceptions of citizenship?" and "How critical is the school environment to the overall understanding of citizenship?" I speculate that my findings will prove that high school students in Michigan are aware of what it means to be an active and civically engaged citizen; however, they lack the resources to become active or civically engaged citizens. Schools should review their curricula and determine if they have adequately equipped them with the knowledge and resources to educate their students on becoming active and civically engaged students.

INTERNET PIRACY: A PSYCHOLOGICAL APPROACH
Matthew Hansberry
Location: Green Room, 2:30 PM
Category: Digital Media-Section 2, Oral
Mentor(s): Danielle Devoss (Writing, Rhetoric, and American Culture)
As society continues to advance further into the technological era, the reliance placed on "computer technology" continues to increase as an essential aspect needed for sufficient societal function. This natural progression has resulted in a more capable Internet user population, one that has been afforded freedom of choice over their own Internet use. However, this power of choice is sometimes abused and digital crime results. The most common form of digital crime is Internet Piracy, the illegal downloading or sharing of copyright-infringed files over the Internet. As computer technology continued to advance, this problem began to plague multimedia and entertainment corporations, specifically, companies marketing music, movies, and computer software. As a means of stopping, or at the very least, limiting the transaction of illegal sharing and downloading, many measures had been taken. Such measures included policing of internet usage by internet service provides, international laws governing internet usage, and file protection encryption of multimedia files; all of which have been unsuccessful. This lack of resolve has led to further inquiry into what exactly motivates users to download, disregarding the traditional methods of strict policing and threat of consequence and focusing more on the psychological and sociological inclinations of Internet users to download illegally. In doing so, exploring the theories of physical separation and custodial nature as a means of approaching Internet Piracy from different perspectives. Ultimately, supplementing society's understanding of the modalities associated with Internet Piracy and user inclination and justification.

CHILDREN'S REPRESENTATION OF UNNATURAL SCENARIOS IN COMPARATIVES
Angie Hardy
Location: Ballroom, 1:30 PM - 3:30 PM
Category: Psychology-Section 3, Poster
Mentor(s): Christina Schmitt (Linguistics)
Making comparisons is something crucial for children in most science learning situations. However, little is known about what children know about comparatives. A comparative requires a gradable adjective, which can be ordered on a scale, and two different individuals (degrees on that scale) being compared together. In this study we examine children and adults' ability to interpret comparatives with relative gradable adjectives of the higher degree (John is taller than Mary.) and equal degree (John is as tall as Mary.) Specifically we test whether 4 and 5-year old children can understand comparatives in contexts that override the world knowledge expectations (we call those unnatural scenarios such as: the mouse is bigger than the elephant or the flower is as tall as the tree). We use the Truth Value Judgment Task (TVJT) to test the possible interpretations, as well as a Picture Matching Task (PMT) to test for the preferred interpretation. We hypothesize that if children accept unnatural scenarios, the representation of adjectives is adult like and does not depend on an absolute standard for the basis of comparison. However if they don't accept the unnatural scenarios, the adjective has a set standard for the nouns being compared or children are unable to go against these markers of the real world. The results will give us information on the nature of the representations of adjectives and the two different types of comparatives.

DORA OR PAT? HOW FAR DOES A CHILD'S TRUST IN A FAMILIAR CHARACTER GO?
Elisabeth Harfmann, Alyssa Segal
Location: Ballroom, 9:30 AM - 11:30 AM
Category: Psychology-Section 2, Poster
Mentor(s): Judith Danovitch (Psychology)
Many advertisements use familiar characters to market their products, as this has been shown to be highly effective. Studies have demonstrated that children easily recall popular characters and are more likely to favor familiar sources when seeking out information. The present study examines how familiarity affects children's decisions when dealing with information from such characters. We hypothesize that children will trust familiar characters unless they have shown to be inaccurate. In part one, preschoolers (ages 4-5) are shown a set of popular animated characters and select their favorite. Their favorite character and a novel character, both similar in appearance, then make contradictory statements about novel concepts. The child is asked to endorse the statements of one of these characters. Next, children hear one character make obviously incorrect claims. A second set of questions involving novel concepts is then asked to determine whether a character's inaccuracy affects the child's endorsements. In part two, children choose between two objects. These objects are the same except one is new and the other is damaged but features an image of their favorite character. Data analyses will examine whether the presence of the character's image influences the child's choices and how this may relate to their endorsements in part one. Upon completion, this study will provide further insight into how the use of characters influences children's decisions and judgments, which may have implications for developing policies about advertising to young children.

LAY BELIEFS ABOUT THE NATURE-NURTURE CONTROVERSY: DOES THE EXPERIENCE OF PARENTHOOD MATTER?
Elisabeth Harfmann
Location: Ballroom, 1:30 PM - 3:30 PM
Category: Psychology-Section 3, Poster
Mentor(s): Judith Danovitch (Psychology), Kevin Ford (Psychology)
Numerous studies have examined beliefs about the influence of nature and nurture on behavior and what factors influence these beliefs. However, the impact of parenting and presence of children on lay causal explanations of the nature-nurture controversy has not been well studied. The current study investigates whether differences exist between beliefs in nature-nurture among parents and non-parents. We hypothesize, based on past research, that parents will have stronger beliefs in environmental influences than non-parents. This study will include approximately one hundred female Caucasian Americans between the ages of 26 and 34. Sex, race and age are controlled because differences in these variables are shown to correlate with nature-nurture beliefs. Half of the participants will be women without children and half will be mothers with at least one child between the ages of 1 to 6. The mothers' group will also be divided by the number of children they have. The study consists of two parts. First, participants complete a Beliefs in Heredity scale (based on Furnham et al., 1985) for 16

characteristics, indicating on a 7-point scale the extent to which they believe the development of each characteristic is determined by environmental (1) or genetic factors (7). Then, participants will be asked about their causal attributions in terms of their own children (or hypothetical children) as opposed to their causal beliefs in general. We expect this phrasing will demonstrate even stronger differences in causal attributions.

ENOLASE EXPRESSION, PURIFICATION, AND CRYSTALLIZATION
Paul Harris
Location: Gold Room, 1:30 PM - 3:30 PM
Category: Biochemistry and Molecular Biology-Section 2, Poster
Mentor(s): Dennis Arvidson (Microbiology)
Lactobacillus jensenii, a vaginal microbiota, has been previously shown to inhibit gonococcal interactions with epithelial cells. An enolase from L. jensenii has been expressed in a recombinant Escherichia coli, column purified and crystallized. X-ray crystallography will hopefully lead to an understanding of the exact structure and implied function of this enolase.

SUSTAINABLE TRANSPORTATION METHODS: A CASE STUDY OF BICYCLE USAGE AT MICHIGAN STATE UNIVERSITY
Jeffrey Hartman, Paige Schwartz, Patricia Weiss
Location: Ballroom, 1:30 PM - 3:30 PM
Category: Environmental and Natural Resources-Section 2, Poster
Mentor(s): Steven Safferman (Department of Biosystems and Agricultural Engineering)
The use of motor vehicles to accomplish everyday transportation tasks has become embedded in American culture, and reinforced by legislative and organizational policies. There is a lack of research comparing the costs and benefits of using bikes and other self-propelled transportation modes as compared to motor vehicles over short distances. Our study investigated the financial, economic, and health disparities that exist between the use of a bikes and motor vehicles on the campus of Michigan State University; as well as the feasibility of using bikes in a northern climate where weather and temperature could potentially restrict bike usage. Our data will be collected from real-world measurements, and will then undergo a statistical comparison in order to determine which mode of transportation is more efficient, and should therefore be implemented. We hope the results of this research will help students, faculty, and staff make informed decisions about their transportation needs and promote efficient and sustainable transportation practices.

GERMAN ENVIRONMENTALISM
Joseph Harwood, Natasha Rogers
Location: Ballroom, 9:30 AM - 11:30 AM
Category: Environmental and Natural Resources-Section 1, Poster
Mentor(s): David Kim (German Language Department)
We will be discussing the past, present and future of German environmentalism and international environmental policy.

THE BIOLOGICAL ROLE AND FUNCTION OF COIR3 UPON INSECT HERBIVORY
Joshua Hasting
Location: Gold Room, 9:30 AM - 11:30 AM
Category: Biochemistry and Molecular Biology-Section 1, Poster
Mentor(s): Marco Herde (Howe Lab)
Terrestrial communities are inhabited by an extraordinary diversity of herbivorous insect and plant species that are engaged in a coevolutionary arms race to eat or not be eaten. Recently major advances in understanding the signaling events leading to plant defense against insects were made. The plant hormone jasmonoyl-isoleucine (JA-Ile), upon its rapid synthesis in response to herbivory, triggers the expression of a large number of plant genes involved in the plant defense against herbivores. Although gene expression studies identified hundreds of genes up regulated by JA-Ile signaling, little is known about their functional role. Glucosinolates, a class of secondary metabolites, was shown to greatly impact herbivores reared on A. thaliana. Glucosinolate production in A. thaliana is constitutive but stimulated by JA-Ile and herbivory. Here we report the characterization of the JA-Ile inducible gene CORI3 in A. thaliana whose in vitro activity was previously described as the cleavage of the L-cystine sulphur bond. We produced transgenic A. thaliana plants expressing a RNAi construct, targeting CORI3 leading to strong suppression of CORI3 transcript in these plants. Spodoptera exigua (a generalist herbivore) larvae grown on these CORI3 RNAi plants gained more weight than on the corresponding wildtype. Furthermore, CORI3 RNAi plants had reduced levels of glucosinolates offering an explanation for the improved larval performance of herbivores reared on CORI3 RNAi plants. We hypothesize that CORI3 has a mechanistically similar role to a previously described gene in glucosinolate biosynthesis putatively providing a mechanism to further stimulate glucosinolate biosynthesis upon herbivory.

THE INTERSECTION: AFRICAN AMERICAN WOMEN AND POLITICAL THOUGHT
Cletissa Haynes-Hogue
Location: Lake Superior Room, 11:00 AM
Category: Social Science: General-Section 3, Oral
Mentor(s): Curtis Stokes (James Madison College)
This research was conducted to examine the way that African American women perspectives are taught within universities in the core classes of the major's political theory or political science. By examining this issue, universities can better prepare their students for the political arena by re- evaluating their core courses and adding this new perspective to them. The reason that I am interested in this research topic is because I am an African American woman studying in the field of Political Theory. In a comparison study of five universities syllabi's within the Big Ten Conference: Michigan State University, University of Michigan, Pennsylvania State University, Ohio State University and Iowa University I plan to examine the core courses of these majors within the last four years. This research seeks to examine the availability, content, and context in which these courses are being taught. In doing this research I believe that my hypothesis, that the connection between African American

women and political thought is rarely acknowledged or discussed within the lecture halls of these higher learning institutions will be proven correct. This comparison study offers a sense of how many students in America will enter into the political arena with a disadvantage. This research is important because it affects African American women as a whole; people can't defend people they have no knowledge of.

JUSTICE JOHN PAUL STEVENS AND AN EVOLVING VIEW OF A CAPITAL PUNISHMENT
Netkeitha Heath
Location: Gold Room, 1:30 PM - 3:30 PM
Category: Social Science: General-Section 2, Poster
Mentor(s): Christopher Smith (Criminal Justice)
This project will explore U.S. Supreme Court Justice John Paul Stevens decision making as it relates to capital punishment. Justice Stevens has sat on the U.S. Supreme Court since 1975; yet there is very little scholarly work published that analyze his opinions and the direction he has voted in many cases. The purpose of this research will serve as one component to a larger, long- term research project carried out by Dr. Christopher Smith in the MSU School of Criminal Justice. Dr. Smith is working on a book to be entitled "Justice John Paul Stevens: Life Experience and the Law" that will argue that many aspects of decision making can be traced to learning experiences that Justice Stevens had throughout his life. The observations in this research will attempt to raise discussion as to whether Justice Stevens decision making has changed to a more liberal stance in capital punishment cases- over the course of his Supreme Court career; or if the Court becoming more conservative over the years is the explanation for him seeming more liberal. The hypothesis is that Justice Stevens has changed by becoming more consistently supportive of individual rights- as it relates to the death penalty. The hypothesis will be tested by examining and tracing all Supreme Court cases relating to capital punishment since 1975, focusing specifically on Justice Stevens rulings on each case.

LANGUAGE AT THE TIPPING POINT: HOW DIVERSE ACOUSTIC CUES AFFECT WORD PERCEPTION
Chris Heffner
Location: Parlor C, 12:30 PM
Category: Psychology, Oral
Mentor(s): Laura Dilley (Communicative Sciences and Disorders)
Words in a sentence can be understood well at either fast or slow rates; this would seem to suggest that speech rate does not impact the perception of words, including where in the speech signal they are heard to begin and end. However, recent findings show that speeding up or slowing down the speech rate around a function word, e.g., "or" in the phrase "minor or child" spoken casually, can affect the perception of whether the function word is present, and hence whether a given point in the speech stream is perceived as beginning a word. Many other acoustic cues, such as intensity and frequency (correlates of loudness and pitch, respectively), are used by listeners to determine word boundaries in casual speech. The purpose of two experiments was to manipulate intensity, frequency and speech rate in order to determine whether such cues combine additively or interactively to determine perception of function word boundaries. It is hypothesized that each cue, independently of the others, will help determine whether function words are perceived. Preliminary results for the first experiment, in which both speech rate and intensity were manipulated, indicate that each cue affects the rate of perceiving a function word, with no interaction apparent among the cues. These findings will further speech comprehension research, by shedding more light on how spoken sentences are perceived to be composed of discrete words, given the continuous nature of the acoustic signal.

LUNG TUMOR PROMOTING PROPERTIES OF 1-METHLYANTHRACENE, A CIGARETTE SMOKE PREVALENT POLYCYCLIC AROMATIC HYDROCARBON
Katherine Helms
Location: Gold Room, 9:30 AM - 11:30 AM
Category: Cell Biology, Genetics, and Genomics-Section 1, Poster
Mentor(s): Pavel Babica (Pediatrics and Human Development), Alison Bauer (Pathobiology and Diagnostic Investigation), Brad Upham (Pediatrics and Human Development)
Low molecular weight (MW) polycyclic aromatic hydrocarbons (PAH)s are the most abundant PAHs in cigarette smoke and in the environment. However, little is known about their biological effects. We determined if structurally similar low MW PAHs (1-methylanthracene (1-ME) and 2-methylanthracene (2-ME))exhibited tumor promoting characteristics as a function of gap junctional intercellular communication (GJIC)in a murine cell line that is a progenitor cell type of lung adenocarcinoma. C10 cells, a non-tumorigenic type II alveolar pneumocyte cell line, were used to assess effects of 1-ME and 2-ME on GJIC at noncytotoxic doses over a time course of 0.5 to 6 h. A scrape load-dye transfer assay and neutral red uptake assay were used to assess GJIC and cytotoxicity, respectively. TPA, a model tumor promoter, was used as a positive control. Additionally, we determined if the PAHs inhibited GJIC either through a MAP kinase (MEK)-dependent or phosphotidylcholine-phospholipase C (PC-PLC)-dependent pathway using highly selective antagonists. The C10 cells communicated normally in serum-free media. 1-ME and TPA, but not 2-ME, significantly inhibited GJIC in C10 cells at noncytotoxic doses. Inhibition of the PC-PLC pathway with D609, prevented inhibition of GJIC by 1-ME, while blocking the MEK pathway with U0126, did not. In conclusion, 1-ME, but not 2-ME, inhibits GJIC through a PC-PLC-dependent pathway. This tumorigenic phenotype suggests a role for the understudied tobacco smoke compound during tumor promotion. Future studies will address the in vivo role of 1-ME as a tumor promoter in a 2-stage initiation/promotion mouse model.

ANAEROBIC DIGESTION OF DAIRY MANURE SUPPLEMENTED WITH DUCKWEED
Shannon Henderson
Location: Gold Room, 9:30 AM - 11:30 AM
Category: Engineering, Computer Sci, and Math- Section 1, Poster
Mentor(s): Dawn Reinhold (Biosystems and Agricultural Engineering)
Anaerobic digestion (AD) has become an increasingly popular method of treating wastewater or sludges from animal feeding operations. Enhancement of biogas production in anaerobic digesters, through addition of commonly-available and under-utilized biomass, could benefit sustainability of farm-scale anaerobic digesters. Duckweed is a common aquatic plant that aggressively grows in farm ponds, lagoons, and other water bodies that receive agricultural runoff. As such, duckweed is a readily-available biomass that could be easily added to farm-scale

anaerobic digesters. Therefore, research aimed to determine if biogas (methane) production could be improved by supplementing digesters with duckweed (e.g., Landoltia punctata). Increases in biogas production and rate of attaining peak biogas production were assessed in batch continuously-stirred reactors at 35°C. Varying concentrations of duckweed were added to dairy manure slurries and gas production was observed for 20-40 days. Additionally, subsequent research will assess the effect of varying growth conditions of duckweed, such as varying concentrations of iron and and anaerobic digestate. Preliminary results indicate that addition of duckweed, in the range of 0.5 to 2% (dry mass), enhanced methane and total gas production in dairy manure slurries; however, subsequent increases in methane and total gas production at >2% duckweed were not observed. In conclusion, addition of duckweed biomass, produced during treatment of agricultural wastewaters and runoff, to anaerobic digesters is a promising approach to enhancement of biogas production.

MOBILE TECHNOLOGIES: RECONSTRUCTING OUR HISTORIC PAST
Jamie Henry
Location: Lake Erie Room, 2:45 PM
Category: Social Science: General-Section 2, Oral
Mentor(s): Lynne Goldstein (Anthropology)
MSU's Campus Archaeology Program (CAP) has a major focus on public engagement. The public as defined for this program includes students, other faculty, administrators, staff, citizens, schoolchildren, alumni, other archaeologists, and anyone else who may be interested. When CAP conducts excavations or surveys, they are done right on campus, and anyone passing by can visit and look. But, we also want people who cannot visit to know what we are doing and why. CAP has been experimenting with different social media to improve our outreach effectiveness. How do we make our work more accessible, even to those who may not yet know the Program exists? Mobile technologies (MTs) are advancing at a rapid rate, and with WiFi and 3G networks becoming more ubiquitous, they will be easier to use. Campus Archaeology already makes extensive use of Facebook and Twitter to keep followers informed, but we hope that some of the new MTs will allow us to reach people who know nothing about the program. With the increasing popularity of geolocation programs such as Yelp.com and Foursquare.com, Campus Archaeology is investigating these tools as a possible way to reach an even greater public and create an archaeological walking tour of campus. In this paper, I will look at different ways to utilize MTs in order to make our historic landscape digital and come to life. Also, I hope to explore different technologies that can help us attain our goal of making the information more accessible and more interactive with the public.

STILL BURNING: (RE) LIVING THE RICOCHET OF POST-RIOT DETROIT THROUGH MICHIGAN STATE UNIVERSITY'S PRODUCTION OF PALMER PARK
Ron Hilliard
Location: Lake Huron Room, 9:30 AM
Category: Humanities and Peforming Arts-Section 1, Oral
Mentor(s): Chaya Gordon-Bland (Theatre)
Joanna McClelland Glass' post-riot urban tale, Palmer Park, takes place in Detroit between 1968 and 1971, immediately following the infamous race rebellion that consumed the city for four days, and from which the city has never fully recovered. Glass' play (based on true events) documents and explores the struggle of five couples, in a middle-class community, to maintain racial integration in their neighborhood and public schools in these tumultuous years. The matters of the play are very close to us: geographically, temporally, and culturally. The economic woes that are so salient in Detroit are ricocheting throughout the state of Michigan and beyond. And the issues and questions that the play provokes, including race, class and education, are well beyond the city limits of Detroit. The article will explore the process of how we worked to foster connections between the matter of the play and the lives of the audience, by first fostering those same connections for all the student artists who created the production. Our artistic process was demanding, personal, and intensive. We embarked upon extensive research, explored a variety of Detroit neighborhoods, and engaged in ongoing dialogue about the complex issues that the play elicits, and how those issues connect to our own lives.

GREEN POLLING: A STUDY IN THE USE OF ENVIRONMENTAL LANGUAGE AND ITS INFLUENCE ON PUBLIC OPINION
Aaron Hinman
Location: Lake Superior Room, 10:30 AM
Category: Social Science: General-Section 3, Oral
Mentor(s): Richard Hula (Political Science), Gabe Ording (Entomology Natural Science), Charles Ostrom (Political Science)
The research project is an analysis of public opinion data collected over the past twenty years (1989-2009) through various polling agencies. The area in which these responses were collected is that of Global Warming and Climate Change. The study is an attempt to compare language use in public opinion questioning between multiple independent polling corporations. In doing so, we will be able to analyze different types of responses through different uses of language (Climate Change vs. Global Warming, Heuristic vs. Political, etc.). The research looks to find a "language spectrum" which political leaders can use in order to decide which type of wording best suits the issue they are attempting to convey to the public at large.

BLACK POWER MOVEMENT AND YELLOW POWER MOVEMENT:THE RELATIONSHIP BETWEEN THE BLACK PANTHER PARTY AND THE ASIAN AMERICAN POLITICAL ALLIANCE
Megumi Hirohara
Location: Ballroom, 10:45 AM
Category: Social Science: General-Section 1, Oral
Mentor(s): Austin Jackson (Residential Collages of Arts and Humanities)
Recent scholarship has effectively demonstrated the influence that the Black Power movement had on other peoples of color and general protest movements in the United States. However, scholars continue to ignore the participation of Asian Americans in the radical protest movements of the 1960s and 1970s, particularly the coalitional relationship between Asian Americans and African Americans. This paper seeks to create a more holistic narrative of the Black Power movement by inserting a new historical perspective, which includes the participation of Asian Americans. Thus, this paper will discuss the relationship between the Black Panther Party (BPP) and the AAPA (Asian American Political

Alliance) during the time period from 1966 until 1976. More specifically, this paper will focus on the practical and ideological exchanges between both organizations during the time period.

DIFFERENTIAL MODULATION OF ALLERGIC AIRWAY RESPONSES IN MICE BY IN UTERO AND EARLY LIFE DIETARY INTAKE OF THE VITAMIN E: GAMMA-TOCOPHEROL VERSUS ALPHA-TOCOPHEROL

Vanessa Hoang

Location: Ballroom, 1:30 PM - 3:30 PM

Category: Microbiology, Immunology, and Infectious Disease-Section 3, Poster

Mentor(s): Norman Hord (Food Science and Human Nutrition), James Wagner (Pathobiology and Diagnostic Investigation)

Studies of mothers and their children suggest that specific nutrient intake during pregnancy and early life may influence the development of allergic airway disease. We used BALB/cJ mice to test the hypothesis that in utero and early life dietary intake of the vitamin E isoforms, alpha and gamma-tocopherol (aT and gT, respectively) can modulate allergic airway responses in offspring. Female BALB/cJ mice were placed on diets containing 50mg aT and 50mg gT/kg diet (normal diet), a high aT diet (400mg aT, 50mg gT), or a high gT diet (50mg aT, 300mg gT), during breeding, pregnancy and nursing. Weaned mice continued their respective diets. At 4weeks, mice were immunized to the foreign protein ovalbumin (OVA), boosted 10d later, and after 7d intranasally (IN) challenged with 0.5%OVA. Twenty-four hours after INOVA, mice were necropsied, airways instilled with saline to collect bronchoalveolar lavage fluid (BALF), and lungs processed for digital morphometric assessment of intraepithelial mucosubstances (IM). Analysis of proximal and distal lung showed decreased amounts of OVA-induced IM with high aT and high gT diets compared to mice on normal diet. Furthermore, there was a trend for greater efficacy to reduce IM with the high gT diet. BALF analysis revealed that with high gT, but not high aT, OVA-induced inflammatory cell infiltrations were reduced compared to normal diets. These data demonstrate that maternal and early life intakes of gT and aT vitamin E isoforms can promote healthy pulmonary and immune development and protect from allergic airways disease.

THE ROLE OF IRF6 IN THE DIFFERENTIATION AND DEVELOPMENT OF THE MURINE PLACENTA

Mary Ellen Hoinski

Location: Gold Room, 1:30 PM - 3:30 PM

Category: Cell Biology, Genetics, and Genomics-Section 3, Poster

Mentor(s): Brian Schutte (Microbiology and Molecular Genetics)

Interferon regulatory factor 6 plays a significant role in the trophectodermal differentiation and murine placental development. Prior genetic testing in zebra fish and frog has demonstrated that Irf6 has functions in the extra embryonic tissue. In order to determine if Irf6 also plays a similar developmental role in mammals, testing must be done to measure Irf6 and its effects in the murine placenta. This was done by measuring the morphological differences of the labyrinth and junctional zone layers of the wild type of mutant placenta at embryonic days 14.5 and 17.5, the mutant placenta produced from embryos lacking Irf6. Hematoxylin and eosin staining was done on three specific sections of the placenta, and the area was taken of the labyrinth layer alone as well as the junctional zone and labyrinth layer of each section, and these results were used to calculate the area of the junctional zone alone. In E14.5 placenta, there was not a significant difference in the calculated areas and the ratios of these areas. Data for E17.5 placentas is still being gathered and analyzed to determine any significant differences in the observed areas. Additional experimentation is being done by our lab with Irf6 and its role in the development of other structures within the placenta. Understanding the role of Irf6 in extra-embryonic tissue may be applicable clinically because genetic variation of Irf6 contributes to cleft lip and palate.

TOWARD MAP-BASED CLONING OF THE UNIFORM GRAY-GREEN GENE IN TOMATO

William Holdsworth

Location: Parlor B, 9:30 AM

Category: Cell Biology, Genetics, and Genomics, Oral

Mentor(s): Cornelius Barry (Horticulture)

The fruits of cultivated tomato display a wide range of color variation, which plant breeders have exploited to produce new varieties with altered characteristics. The uniform gray-green (ug) mutant of tomato lacks the dark green shoulder that is typical of cultivated tomato. Fruits that possess a dark shoulder are often characterized by blotchy and uneven ripening which represents a negative quality trait. The ug mutant, together with a closely related mutant, uniform (u), have been extensively used by breeders to produce tomato fruits that ripen to an even color across the entire fruit surface. The biological basis for the u and ug mutant phenotypes is unknown. The aim of this research is to identify the gene responsible for the ug mutant phenotype. A segregating F2 population generated from a cross between Solanum lycopersicum (ug/ug) and Solanum pimpinellifolium (UG/UG) was developed and linkage of the mutant phenotype with tomato molecular markers was established. These data suggested that ug is located on the long arm of chromosome one. Using additional chromosome one genetic markers and a population of 1600 F2 individuals, the map position of ug has been refined to an interval spanning less than 0.5 cM. With the aid of the prerelease of the tomato genome, candidate genes have been identified within the interval, and current efforts are focused on cloning these candidates. Once the gene is mapped and isolated, the mechanism behind gene function will be analyzed.

GENETIC ASSESSMENT OF HATCHERY REARED LAKE STURGEON (ACIPENSER FULVESCENS) STRAYING AND RECRUITMENT INTO NON-TARGET STREAMS

Jared Homola

Location: Parlor C, 9:30 AM

Category: Environmental and Natural Resources, Oral

Mentor(s): Kim Scribner (Fisheries and Wildlife, Zoology)

From 1983-1994 lake sturgeon (Acipenser fulvescens) propagated using eggs taken from Lake Winnebago strain (Lake Michigan basin) individuals were released into the St. Louis River estuary in western Lake Superior. If interbreeding occurs with nearby genetically differing populations, outbreeding depression could jeopardize beneficial site-specific phenotypic and genotypic adaptation. We investigated if these introduced individuals have become integrated into the annual spawning run in the Sturgeon River, Houghton and Baraga counties, Michigan.

Additionally, we established a baseline natural migration rate between the Sturgeon River and the nearby Bad River population. Lake sturgeon sampled during Sturgeon River spawning runs from 2003-2008 which possessed known primiparous size characteristics were genotyped at 12 microsatellite loci. Genotypic baselines were then established for the Sturgeon River (n=101), Bad River (n=40), and the Lake Winnebago river system (n=73). Assignment testing indicated no migration of Lake Winnebago strain lake sturgeon from the St. Louis River system into the Sturgeon River spawning population. One primiparous Sturgeon River lake sturgeon was found to have originated from the Bad River population. Four first generation migrants of older age were detected in the Sturgeon River baseline, leading us to establish a 3.5% natural migration rate for the system.

INCUMBENT SOCIALIZATION MESSAGE EFFECTS ON PERFORMANCE AND JOB FIT OF NEW MICHIGAN STATE RESIDENCE LIFE MENTORS
Michael Hosler
Location: Lake Superior Room, 2:15 PM
Category: Communication Arts and Sciences, Oral
Mentor(s): Vernon Miller (Communication/Management)
Socialization of new employees into an organization is important in order to pass information, norms, and culture to the next generation (Van Maanen & Schein, 1979). Socialization activities can lead to higher initial job satisfaction and lower levels of voluntary turnover (Jablin, 2001; Zurcher, 1983). At times, however, newcomers receive mixed messages concerning the values of the organization's policies and job duties. For example newcomers are sometimes more influenced by messages from disaffected incumbents than from supervisors and "model" members, which may interfere with their acclimation and performance. Hence, it is important to understand the elements that affect the newcomers' receptiveness to the varying information and the potential outcomes of these messages. This study investigates new MSU Residence Life Mentors and factors that affect the quality of their socialization. It is theorized that newcomers receiving messages in support of organizational ideals are likely to develop attitudes in support of the organization and be judged to have better performance and job fit than those receiving non-supportive messages. Factors that will be observed include the types of messages coming from incumbent socialization agents, the extent of their influence, and the timing of influential messages. The criterion variables in this study will be supervisory reports of job performance and fit within the job and organization. It is hoped that this study will aid Michigan State Residence Life in how it socializes new mentors and what indicators it uses to track new mentors' adjustment.

COMPUTATIONAL MODELING AND MOLECULAR DOCKING OF LIGANDS TO THE PUTATIVE ACTIVE SITE OF THE FLAVIN ADENINE DINUCLEOTIDE-CONTAINING AIDB ALKYLATION RESPONSE PROTEIN OF ESCHERICHIA COLI
Michael Howard
Location: Gold Room, 9:30 AM - 11:30 AM
Category: Biochemistry and Molecular Biology-Section 1, Poster
Mentor(s): Robert Hausinger (Biochemistry and Molecular Biology, Microbiology and Molecular Genetics), Scott Mulrooney (Microbiology and Molecular Genetics)
Exposure of Escherichia coli to alkylating agents activates expression of three DNA repair proteins Ada, AlkA, and AlkB along with AidB. Previous studies have shown that AidB binds to double-stranded DNA, contains a redox active flavin adenine dinucleotide (FAD) prosthetic group, and exhibits a crystalline structure similar to the flavin-containing acyl-CoA dehydrogenases (ACADs). The molecular mechanism by which AidB reduces the effects of alkylation damage is unknown, but direct enzymatic repair of alkylated DNA, protection of DNA from the reagents, and destruction of alkylating agents have been proposed. In this study, the accessibility of the putative FAD active site was examined by computational modeling using two different ligand docking programs: Dock Blaster and SLIDE (Screening for Ligands by Induced-fit Docking). Both programs suggest that the FAD active site could bind molecules resembling free pyrimidines and purines, thus supporting a direct enzymatic role in DNA repair.

RAPID DETECTION OF PAGA GENE OF BACILLUS ANTHRACIS USING A NANOPARTICLE-BASED BIO-BARCODE DNA SENSOR
Michael Huarng
Location: Gold Room, 9:30 AM - 11:30 AM
Category: Engineering, Computer Sci, and Math- Section 1, Poster
Mentor(s): Evangelyn Alocilja (Biosystems Engineering), Deng Zhang (Biosystems Engineering)
Biosensors provide a rapid and sensitive means in detecting pathogens for food safety and antiâ€□bioterrorism. This poster describes a biosensor system composed of gold and magnetic nanoparticles (AuNPs and MNPs, respectively) in detecting the pagA gene in Bacillus anthracis. AuNPs were coated with a target-specific DNA probe (pDNA) and biobarcode DNA (bDNA). Lead sulfide (PbS) or cadmium sulfide (CdS) nanoparticle tracer (NT) was conjugated with AuNPs through biobarcode DNA as a signal indicator. MNPs were coated with another target-specific pDNA. After hybridization, a sandwich structure (MNPs --2nd pDNA/tDNA/1st pDNA-AuNPs-bDNA-NTs) was formed and then magnetically separated from unreacted materials. The NTs on the AuNPs' surface were dissolved in 1M nitric acid in order to release the metal ions (Pb2+ or Cd2+). These metal ions are detected by square wave anodic stripping voltammetry on a screen-printed carbon electrode (SPCE) sensor. The detection limit of this bio-barcoded DNA sensor is as low as 0.2 ng/mL using cadmium sulfide NTs, or 0.02 ng/mL using lead sulfide NTs. The biosensor provides a potential multiple detection method in food safety and counter-bioterrorism.

FAMILY HISTORY OF DEPRESSION AND WORKING MEMORY PERFORMANCE
Nicholas Hubbard
Location: Ballroom, 9:30 AM - 11:30 AM
Category: Psychology-Section 1, Poster
Mentor(s): Ryan Bowles (Psychology)
In this study approximately 500 undergraduate students will be administered a standard working memory task (Operation Span; Turner & Engle, 1989), a depression inventory (CES-D; Randolff, 1977), and a subjective report of family history of depression. Our hypothesis is that individuals with a family history of depression, who are not exhibiting significant depressive symptoms, will display lower working memory spans; even after controlling for their subclinical symptoms. Data collection is ongoing and will be completed by March, 2010.

GEOCHEMICAL CORRELATIONS BETWEEN DIKES AND FLOWS IN THE KEWEENAWAN FLOOD BASALT PROVINCE
Thomas Hudgins
Location: Ballroom, 9:30 AM - 11:30 AM
Category: Physical Sciences, Poster
Mentor(s): Tyrone Rooney (Geological Sciences)
Dike swarms are often the only remaining portions of ancient continental flood basalt provinces as erosive processes remove the thick flows of modern provinces. In the absence of sub-aerial basaltic flows, the chemical composition of dike swarms has been suggested as an analogue to the eroded basalts, however the degree to which a flood basalt lava-pile and dike swarms correlate remains poorly constrained. The Mamainse Point Formation, at 5250m thick, forms the most extensive and continuous portion of the ~1100Ma Keweenawan flood basalt province. Due to its continuity, the Mamainse Point Formation has recorded almost the entire petrogenetic evolution of the flood basalt province and contains extensive diking representing its magmatic plumbing system. The extensive dike swarm in the area, combined with the existing detailed chemostratigraphic sections, allow for a unique opportunity to correlate dike-swarms with their respective flows in a continental flood basalt province. 25 samples were selected for whole rock analysis based on freshness. The initial results show an average loss on ignition of ~3%, confirming the freshness of the samples. The dikes also show an MgO range of ~3.9% to ~8.8% and a TiO_2 range of ~0.5% to ~3.9%. Preliminary data from dikes sampled show strong major and trace element correlations with the previously identified chemostratigraphic sections of the erupted flood basalts. These data underline the geochemical similarities between the dikes and flows in the Mamainse Point Formation and suggest that dike swarm roots in other provinces may also reflect the chemistry of the eroded flood basalts.

PHENOTYPIC AND GENETIC CHARACTERIZATION OF FRUIT SURFACE MUTANTS OF TOMATO
David Hufnagel, Matthew Bedewitz
Location: Ballroom, 1:30 PM - 3:30 PM
Category: Agriculture and Animal Science, Poster
Mentor(s): Cornelius Barry (Horticulture)
Plant surfaces are covered by a cuticle that helps to reduce water loss and provides a physical and chemical barrier against environmental stress. The cuticle is comprised of a cutin polymer, which forms structural support, embedded within a matrix of waxes and polysaccharides. In fleshy fruits, mechanical failure of the cuticle results in fruit splitting and cracking leading to substantial crop losses during production and postharvest storage. The cuticle also influences quality attributes in fleshy fruits including color, sheen, and uniformity that influence consumer acceptance. Currently, little is known about the molecular factors that contribute to the synthesis of fruit cuticles. The properties of fruit cuticles are being studied through analysis of tomato mutants with altered fruit surface characteristics. Fruit of the peach (p) mutant have a dull appearance due to the unusual persistence of trichomes on the mature fruit surface. Scanning electron microscopy and biochemical analysis reveals that p has altered cuticle structure and composition. The cuticle of the easy peel (ep) mutant of tomato can be readily removed without contamination of the underlying pericarp cells suggesting altered adhesion properties between the cuticle and the epidermal cells. Genetic mapping of p and ep indicate that they are located on chromosomes 2 and 8 respectively. Progress toward isolation of these loci utilizing genetic mapping strategies will be presented.

ROLE OF HEAT SHOCK PROTEIN 70 (HSP70) IN O3-INDUCED LUNG INFLAMMATION
Kristin Hummel
Location: Ballroom, 1:30 PM - 3:30 PM
Category: Environmental and Natural Resources-Section 2, Poster
Mentor(s): Alison Bauer (Pathobiology and Diagnostic Investigation)
Ozone (O_3) is a highly toxic air-borne pollutant known to alter lung function in adults and children, exacerbate as well as induce asthma symptoms, and cause mortality. Previous research suggested heat shock protein 70 (Hsp70) involvement in the regulation of O_3-induced lung inflammation, likely through the toll-like-receptor (TLR) 4 pathway. To test this hypothesis, we used Hsp70 deficient mice on a C57BL/6 background and their wildtype (C57BL/6; Hsp70+/+) controls exposed to 6, 24, 48, and 72 hr of continuous 0.3 ppm O_3 exposure or air. We analyzed lung hyperpermeability by total bronchoalveolar lavage fluid (BALF) protein concentration and the total number of neutrophils in the BALF, two definitive signs of inflammation. We observed significant reductions in both phenotypes in the Hsp70-/- compared to the Hsp70+/+ mice. Using real-time quantitative PCR, we observed increased levels of myeloid differentiation factor 88 (MyD88), a downstream signaling adapter in the TLR4 pathway, in the Hsp70+/+ mice in response to O_3 compared to the Hsp70-/- mice. Trif expression, another signaling adaptor, was significantly different between genotypes, but no treatment effect was observed. We also found reduced expression of chemokine C-X-C motif ligand 1 (KC, Cxcl1, GROa), a neutrophil chemoattractant, in the Hsp70-/- mice compared to Hsp70+/+ mice in response to O_3, at both the mRNA and protein levels. Future studies will examine the interactions of Hsp70 and TLR4 in response to O_3. NIEHS/95720-00 (AKB).

IMPLICATIONS OF THE LIGHT-NUTRIENT HYPOTHESIS FOR BACTERIA AND ALGAE INTERACTIONS IN AQUATIC BIOFILMS
Steven Huynh, Tessa Minicucci
Location: Ballroom, 9:30 AM - 11:30 AM
Category: Environmental and Natural Resources-Section 1, Poster
Mentor(s): R Jan Stevenson (Zoology)
Bacteria and algae in aquatic ecosystem biofilms are tightly linked: bacteria rely on carbon (C) algae produce, but both algae and bacteria also require phosphorus (P) for growth. The light-nutrient hypothesis suggests that the C:P ratio in algae changes with light availability; when light is high relative to P, algae shift away from biomass production and excrete C (high C:P), but when light is low relative to P, algae uptake P in excess to facilitate low light survival (low C:P). This has implications for bacteria living in association with algae since C availability to bacteria may be higher in high light-grown algae, but P availability may be higher in low light-grown algae. We tested the hypothesis that light availability alters bacterial nutrient limitation in Sycamore Creek, Lansing, MI. We placed slides in open canopy and artificially shaded habitats for two weeks and allowed biofilms to develop. We then assessed C and P limitation of bacteria in each treatment by incubating biofilms in

streamwater supplemented with no nutrients (control), C, P, or C+P and measuring bacteria response. Bacteria from shaded treatments were C-limited, but bacteria from high treatments were C+P limited. Our results support the hypothesis that light alters bacterial nutrient limitation, although C was consistently limiting to bacteria in both light and shaded habitats. Overall, our data suggest that controls on bacteria are tightly linked to factors affecting algal condition and implies that the interplay between algae and bacteria in biofilms may be more complex than previously understood.

ANALYSIS OF SWARMING MOTILITY OF PAENIBACILLUS SPP
Katherine Ivens
Location: Ballroom, 1:30 PM - 3:30 PM
Category: Microbiology, Immunology, and Infectious Disease-Section 3, Poster
Mentor(s): Terence Marsh (Microbiology and Molecular Genetics)
The ability of individual bacteria to sense environmental conditions allows them to be successful competitors for resources. Bacteria may also move as multicellular collectives, displaying swarming motility across solid agar surfaces. A motile Gram positive Paenibacillus spp. was isolated from the soil environment and was studied on bases of movement and swarming behavior. Motility was observed microscopically on glass slides laden with 0.5x Mueller-Hinton and 1.5% agar. Paenibacillus spp. was stained using SYTO 9 nucleic acid stain and vital fluorescent stain CFDA (6-carboxyfluorescein diacetate) without causing significant undesirable effects on viability or motility. The isolate displayed complex patterns of motility ranging from multicellular extensions departing the colony to internal rotating vortices. Motion of individual cells within the multicellular extensions was inspected extensively. Paenibacillus spp. was investigated to gain a better understanding of the dynamics of bacterial motility.

URBAN STUDENT PERCEPTIONS OF SCHOOL LEADERS UNVEILED: THE POWER OF MOTIVATION
Alexis Jackson, Krystal Bent-Jones, Amber Lawson
Location: Gold Room, 9:30 AM - 11:30 AM
Category: Education-Section 1, Poster
Mentor(s): Laura McNeal (Teacher Education)
In recent years, the role of school principals as agents of change has been the object of several research studies (Trider & Leithwood, 1988; Leithwood & Montgomery, 1984). Although, several research studies have examined the effectiveness of school leadership in relation to school improvement efforts, eliminating achievement disparities, and improving the quality of education from the perspectives of other school leaders, teachers and parents, little attention has been given to student perceptions of the effectiveness of their school leadership's school improvement efforts and ability to promote academic excellence and equity within their schools. This study explored urban students' perception of their school principals as change agents for social justice and what role, if any, their school principal had in shaping and influencing their academic success and trajectory.

EFFECT OF COLIFORM MASTITIS ON OSTEOPONTIN EXPRESSION IN MAMMARY TISSUES OF HOLSTEIN DAIRY COWS
Karmen Jackson
Location: Parlor A, 10:00 AM
Category: Agriculture and Animal Science, Oral
Mentor(s): Elizabeth Karcher (Animal Science)
Mastitis caused by gram-negative bacteria is often characterized by uncontrollable inflammation. Osteopontin (Opn) is a proinflammatory factor that plays a role in initiating the innate immune response by promoting cellular adhesion and eliciting proinflammatory cytokines. The objective of this study was to evaluate Opn gene expression in the mammary tissue of Holstein cows naturally infected with coliform mastitis compared with healthy controls. Parencyhmal tissue and external pudendal arterial samples were collected from 3 euthanized coliform mastitic lactating cows and 3 euthanized lactating coliform-free cows. Real-time PCR was used to evaluate the following genes: Opn, TNF- α, and IL-1. Osteopontin and IL-1 expression did not differ between the coliform infected parenchymal tissues and that of the control tissues. There was a trend for greater TNF-A expression in infected tissues compared with controls. The severity and duration of coliform infection was not controlled in this study and expression of proinflammatory genes may be affected by these two factors. There was great variability among the parenchymal tissues collected, possibly due to the heterogeneous nature of this tissue. In contrast, there was a 4.2-fold increase in Opn expression between the infected and control arterial samples (4.3 ± 0.5 vs. 1.0 ± 0.3; $P < 0.001$). Unlike the parenchymal tissue, the vasculature represents a more homogeneous population of cells. In conclusion, this is the first study to evaluate the presence of Opn in parenchymal tissue and external pudendal arterial samples. Further controlled studies are needed to reduce the variability observed between the infection groups.

VERTICAL INDUSTRY STANDARDS: SOLVING THE AUTOMOTIVE INDUSTRY CRISIS
Reena Jain
Location: Ballroom, 9:30 AM - 11:30 AM
Category: Communication Arts and Sciences, Poster
Mentor(s): Charles Steinfield (Telecommunication, Information Studies, and Media)
As a result of the 2008 financial crisis and global financial downturn, there was a subsequent automotive industry crisis with declining sales of American automobiles. With a total of $80.1 billion committed to the Automotive Industry Financing Program through the Troubled Asset Relief Program, the auto industry is duty-bound to restructure their supply chain. Imperfect interoperability alone costs the U.S. automotive supply chain approximately $1 billion a year. This research will first examine General Motors (GM) specifically to address the reasons behind the inefficiency of their supply chain and their multiple failed attempts to repair the process. Then, the current successful pilot study of the Material Off-Shore Sourcing (MOSS) project --implemented by GM --will be analyzed and its resulting lessons indicated to show that vertical industry standards are necessary for the auto sector in the present globalized economy. Finally, there will be discussion on the potential successes and failures of the development, implementation and diffusion of an industry wide standard. Vertical industry standards have the promise to solve the high cost of imperfect interoperability on the U.S. automotive industry --the question is whether or not the participants in the automotive supply chain will choose to realize the benefits and adopt a standard.

GEOGRAPHIC RACIAL EQUALITY BETWEEN ASIANS AND WHITES IN ORANGE COUNTY, CALIFORNIA
Nathan Jandernoa
Location: Gold Room, 9:30 AM - 11:30 AM
Category: Social Science: General-Section 1, Poster
Mentor(s): Joe Darden (Geography)
This paper determines to what extent geographic racial equality exists between Asians and Whites in Orange County California. I hypothesize that 15 percent of the 33 municipalities of Orange County would be areas of geographic racial equality. Data were obtained from the 2000 U.S. Census Summary File 4 and Summary File 3. A ratio was computed to analyze the data for Asian and White median household income. The percent of Asians and Whites aged 25 and older with a bachelor's degree or higher was also compared along with the percent of the population age 16 and older with a managerial or professional occupation. The level of residential segregation was determined by computing an index of dissimilarity by census tract for each of the municipalities in Orange County. Those municipalities in which Asians had achieved parity with Whites in the areas of median household income, educational attainment, and occupational status and had an index of dissimilarity less than 50 were considered to have attained geographic racial equality. The results revealed that there are 14 municipalities of the 33 in Orange County or 42.4% that have attained geographic racial equality. Thus the hypothesis was accepted. Asians in Orange County appear to have assimilated very effectively with Whites in terms of geographic racial equality. The percent of Asians living in areas of geographic racial equality in Orange County is 79.9%, while the percent of Whites living in such areas is 54.8%.

DETECTING AND COMPARING BRAIN ACTIVATION BETWEEN READING STORIES AND VIEWING PICTURES USING FMRI
David Janego, Alita Caldwell, Alicia Johnson
Location: Ballroom, 9:30 AM - 11:30 AM
Category: Psychology-Section 2, Poster
Mentor(s): Jie Huang (Radiology)
It is often said that a picture is worth a thousand words, but is this truly the case? Six right-handed college students participated in a study to compare brain activation while reading short stories to viewing photographs. A functional MRI was used to measure neuronal firing, induced blood oxygen level changes in the brains of the subjects while they performed the aforementioned tasks, linking measured MRI signal changes with local brain activation. The study consisted of a block paradigm, with four functional scans and one anatomical scan. Each functional scan consisted of twelve task periods of 18 seconds each alternated with 18 seconds of rest period. Volume images to cover the whole brain were recorded every two seconds. Images from each subject were saved and transferred to a computer to be analyzed using the program AFNI. Our study focused on eight of the twelve task periods in which reading stories and viewing pictures was the focus. Both tasks produced similar amounts of brain activation, but the location of the activation differed. Although this may not prove that a picture is worth a thousand words, it shows that both reading stories and viewing pictures result in similar amounts of brain activation.

ESOTERICISM, RELIGION, AND NATURE: PUBLISHING AN ACADEMIC BOOK
Constance Jasiak
Location: Ballroom, 1:30 PM - 3:30 PM
Category: Humanities and Peforming Arts, Poster
Mentor(s): Arthur Versluis (Religious Studies)
My responsibilities as an undergraduate researcher have been focused on bringing multiple essays on esotericism, religion and nature together into one academic book. I have engaged in activities such as reading and responding to emails from the various authors included in the book, as well as hands on editing with the publishing program. I have also read through the book multiple times and made revisions, as well as assisted with the indexing of the book. The book ranges from essays on music and nature to Appalachian Mountain religious tradition, and many other interesting topics in between.

MICROSCOPIC FEATURES OF MARTIAN METEORITE NAKHLA SHOW SIMILARITY TO NATURAL DISSOLUTION PATTERNS
Kathleen Jeffery
Location: Ballroom, 9:30 AM - 11:30 AM
Category: Physical Sciences, Poster
Mentor(s): Michael Velbel (Geological Sciences)
Olivine, an iron-magnesium silicate mineral, is common in volcanic rocks throughout the solar system. Previous work has demonstrated that tunnel-like alterations in olivine in terrestrial Hawaiian basalt and dunite samples are similar to tunnels in basalt glass which are thought to be created by microorganisms. The biogenicity of the tunnels and galleries in olivine was not proven, but no abiotic mechanism capable of producing such alterations in olivine was known. The researchers then examined the Martian meteorite Nakhla, which contained similar features, possibly suggesting its alteration was due to some biotic process. However, careful study of terrestrial olivine samples under light microscope has shown numerous instances of diamond-shaped etch pits formed by dissolution during natural weathering which can coalesce to create tunnel-like features in a variety of geometries. These features are similar in morphology to those found in Nakhla, providing another possible explanation for the origin of its tunnel-like features. Investigation of biologically affected olivine crystals in Hawaiian basalts has shown few features with morphological similarity to Nakhla. Visual similarities have been established between Nakhla and the olivine samples. The next step is to establish geometric similarities such as feature dimensionality. This will isolate penetrating, tunnel-like features from those that are planar structural phenomena like lamellae. Should such tunnel-like features be found in the olivine samples, those found in Nakhla may also be a result of natural weathering instead of biotic alteration.

DECISION FRAMES ACROSS ANXIOUS AND NON-ANXIOUS POPULATIONS
Alexander Jendrusina
Location: Parlor C, 12:00 PM
Category: Psychology, Oral
Mentor(s): Jason Moser (Psychology), Tim Pleskac (Psychology)
Since individuals make decisions everyday, factors influencing the decision making process would seem paramount to study. However, it would be inaccurate to assume that decisions are always made in the same mental state. Anxiety is seen in both state and trait conditions of people. In this study, risky decision frames mirroring those of Tverksy and Kahneman's Asian disease problems are implemented. Participants are asked to decide on a plan of action in hypothetical scenarios framed in terms of lives lost or lives saved. The second type of question comes from Irwin P. Levin, another scholar of decision making. One area of study for Levin has been attribute framing, in which participants evaluate an athlete given positive or negative information. This study employs similar questions. In regards to anxiety, participants will take questionnaires categorizing anxiety level. Collecting one's anxiety level allows us to correlate choice with level. Anxious individuals have a propensity for uncertainty reduction and risk aversion. Keeping this in mind, I expect to see a difference in decision choices between anxious and non anxious participants.

DISCOURSE MARKERS ACROSS LANGUAGES: COMPARING THE FRENCH
Laura Jensen
Location: Lake Huron Room, 1:30 PM
Category: Humanities and Peforming Arts-Section 2, Oral
Mentor(s): Anne Violin-Wigent (French, Classics, and Italian)
Use of the discourse marker “yeah no” in English was first brought to popular attention by Kate Burridge and Margaret Florey in 2002. However, as this study of the French “oui non” (the translation of “yeah no”) will show, the marker is not unique to English. Discourse markers are an element of speech which aid speakers in creating cohesive conversations and in communicating attitudes. Examples of discourse markers in English include you know, so, and well. My research aims to examine the French “oui non”, comparing it with the English yeah no. La Phonologie du Français Contemporain, a corpus of French language, was searched for all utterances of “oui non” by speakers living within France. Every token was examined for the age of speaker, the gender of the speaker, and the function of the marker. The data shows that women between the ages of 20 and 29 make up the majority of those who employ the marker, which differs from results found regarding the use of “yeah no” in Australian and American English. Regarding the function of the marker, the results suggest that the primary role of “oui non” is propositional, serving as assent-dissent, emphatic agreement, or emphatic disagreement. Taking into account previous studies of the functions of “yeah no,” it may be concluded that the two markers serve similar purposes within their respective languages.

EXAMINING CHANGE IN ALORS, A COMMON FRENCH DISCOURSE MARKER
Laura Jensen
Location: Lake Huron Room, 9:45 AM
Category: Humanities and Peforming Arts-Section 1, Oral
Mentor(s): Anne Violin-Wigent (French, Classics, and Italian)
All languages have words we often take no notice of, but which are crucial to creating smooth conversations. Known as discourse markers these words help us conceptualize and organize ongoing conversations and often contain hints about the speaker’s attitudes. In English, discourse markers include words like so, you know, and anyways. These words lend a great deal of naturalness to conversation, but are not usually addressed in language or linguistics courses. My aim is to bring attention to one such word in the French language: alors, which is typically translated as so or then. In this study, I examine which discourse functions alors may serve and which demographic group employs it most frequently. Using an online corpus, La Phonologie du Français Contemporain, the transcripts of 36 native French speakers were searched for tokens of alors. These speakers were evenly distributed across date of birth (three generations), region (north/south), and gender. The results suggest that the youngest generation uses alors less frequently than the older generations. Also, while some researchers have identified as many as 12 functions for the marker, foregrounding accounts for nearly half of the tokens analyzed in my study. Foregrounding, which is often used in narratives, casts previous discourse as background and brings the current utterance to the fore. Finally, as the youngest generation is using the marker in a more varied manner than the older generations, we can conclude that the marker appears to be widening its functional scope.

THE EFFECT OF TEMPERATURE AND LIGHT ON BENTHIC ALGAL GROWTH: IMPLICATIONS FOR EPHEMERAL POOLS ALONG THE RED CEDAR RIVER, LOWER MICHIGAN
Andrew Jessmore
Location: Ballroom, 9:30 AM - 11:30 AM
Category: Environmental and Natural Resources-Section 1, Poster
Mentor(s): Kevin Wyatt (Zoology)
Benthic algal growth can cause changes in aquatic environments like the ephemeral pools found along side the Red Cedar River in East Lansing. The growth of benthic algae depends on temperature and sunlight variables. In the experiment, two environmental variables, temperature and light, were set at varying levels in environmental chambers with containers allowing for algal growth. We hypothesized that there needed to be a balance of both light and temperature for adequate algal growth. When there was algal growth, biomass, dissolved oxygen, and light absorption were recorded for each sample. It was determined that there are certain levels of light and temperature necessary for algal growth. At 24 hours/day light and a constant 30-40°C, the most successful growth was yielded. The results show that stagnant water that is subject to high temperature and light levels will yield surprisingly high, and perhaps dangerous, algal growth. The opposite can be said where ecosystems may suffer because of reduced algal growth due to low light or temperature levels.

APARTHEID'S SEXUAL PERVERSION
Patrice Johnson
Location: Tower Room, 11:00 AM
Category: History, Political Science, and Economics, Oral
Mentor(s): Jill Kelly (History)
I will be analyzing the elements of rape, racism, and capitalism during the 1960s-1980s South Africa. The intersection of rape, racism, and capitalism as a theoretical framework should expose the contrast of sexual gratification and tools of social domination. The expulsion of capitalism and race in the act of rape should produce a comprehension of both structural racism in public policy which denies protection for black women and a state ownership of the black female body. This paper proposes to analyze the elements of rape, racism, and capitalism in apartheid South Africa between the years of 1960-1988. Using the intersection of rape, racism, and capitalism I believe and will contend that rape is an act of social domination through a metaphysical consciousness of ownership. It is not a means of sexual gratification, but is however perverted through the ideology of capitalism. Through historical research, I will analyze the events of rape as told to the Truth and Reconciliation Commission (TRC) by South African women. I will further acknowledge specific South African rape policies and statutes. Of these policies I will question the protection of black women as victims of rape. In addition, I will relate the acts of rape to power-related positions assumed through the capitalist setting.

STREAM LENGTH GRADIENT RESPONSES TO ACTIVE LANDSCAPE DEFORMATION IN NORTHEASTERN RUSSIA
Benjamin Johnson
Location: Ballroom, 9:30 AM - 11:30 AM
Category: Physical Sciences, Poster
Mentor(s): Kazuya Fujita (Geological Sciences)
The structural complexity of northeastern Russian is largely due to the diffuse interactions among the boundaries that divide the North American plate, the Eurasian plate, and the Okhotsk Plate. In this study, 30 longitudinal stream profiles that encompass two of the major drainage networks in Northeastern Russia were generated to remotely sense the actively deforming landscape of the region. Our methods were first tested in the Seymchan-Buyunda Basin where past field observations have indicated that it is an active pull-apart basin. Further collection of data has drawn the study's attention to the Myatis Thrust and Indigirka-Zyryanka Basin where past studies have suggested that these structures have recently gone inactive. However, the longitudinal profiles generated in this study may indicate that these structures are presently active and are making larger contributions to the deformation of the regional landscape than seismic data and past studies may suggest. This study, through the use of stream length gradient calculation, has produced a new data set in a remote region where many geologic processes are still unknown. Stream length gradient and other geomorphic studies like this will continue to make large contributions to the understanding of the neotectonics in Northeastern Russia.

3D PATIENT MODEL GENERATION FOR HYPERTHERMIA TREATMENT PLANNING USING THE SPARSE FIELD LEVEL SET METHOD
Christopher Johnson
Location: Gold Room, 9:30 AM - 11:30 AM
Category: Engineering, Computer Sci, and Math- Section 1, Poster
Mentor(s): Robert McGough (Electrical Engineering)
Anatomically accurate three-dimensional models are essential for hyperthermia treatment planning. These models are required for visualization and numerical modeling of the target area and the surrounding anatomy, enabling effective optimization of a desired treatment. In an effort to automatically create these 3D models while minimizing the amount of user input required, 2D and 3D versions of the sparse field method for solving level set functions were evaluated. After an initial contour is defined with an image intensity based mask, the sparse field level set method was applied using 250 iterations and a radius of 15 pixels. A comparison between the results obtained with the 2D and 3D level set methods indicates that the 3D level set approach produces much smoother contours with fewer image artifacts and surface discontinuities in the Z direction. The 3D level set algorithm, which automatically enforces slice to slice continuity of anatomical structures, is much more effective than the 2D level set algorithm when the intensity values for an individual anatomical structure varies between slices. This result is highly desirable when generating 3D finite element models for thermal therapy simulations; however, this improved result is obtained at the expense of longer computation time. To segment the fat-muscle boundary in a representative patient model on a 2.2GHz quad core processor with 8GB of RAM, the 3D level set approach takes 3147 seconds while the 2D level set calculation takes only 60.67 seconds. Segmentation of bone produces similar results.

MATERNAL EDUCATION INFLUENCES CHILDREN'S LITERACY ACHIEVEMENT BEFORE AND DURING PRESCHOOL
Kristyn Johnson, Samantha Blair
Location: Gold Room, 1:30 PM - 3:30 PM
Category: Social Science: General-Section 3, Poster
Mentor(s): Hope Gerde (Family and Child Ecology)
Children living in families identified with low socioeconomic status (SES) begin kindergarten with significantly lower literacy skills than their higher SES peers (Lee & Burkam, 2002). Maternal education is one important variable that represents family SES (White, 1982). Our research investigates maternal education as one predictor of children's literacy skills as they enter preschool and beyond. 148 Children (mean age 50.2 months, SD 5.66) were tested individually by trained researchers for phonological awareness, vocabulary, letter word knowledge, and letter knowledge using standardized measures. Children were assessed at the beginning, middle, and end of the preschool year in a quiet room of their preschool center. Mothers varied in their educational background including mothers who completed less than a high school diploma to mothers who completed a graduate degree. Results indicated that mother's education was significantly related to children's literacy skills at the beginning of preschool. And, maternal education predicted children's letter knowledge even after a semester of preschool. Further, children's literacy skills upon entry to preschool were predictive of their skills after a semester of preschool. Thus, the influences of maternal education on literacy skills continue to exist even after formal education begins. And, children who begin school with low literacy skills maintain low literacy skills well into preschool.

SEX AND POLITICS ON THE CAMPAIGN TRAIL
Monika Johnson
Location: Tower Room, 10:00 AM
Category: History, Political Science, and Economics, Oral
Mentor(s): Julia Grant (James Madison College)
American politics has long influenced the social climate of the nation, drawing upon the ideals of opposing parties and competing for the affection of the electorate. In many ways, politics attempts to portray what is "normal"; that is, what most people agree is the truth. However, a tiny fraction of society decides what is depicted as the norm in the political sphere. Today, heterosexual relationships are portrayed and emphasized heavily; in addition, the traditional role of women, though not necessarily advocated vocally, is heavily communicated in advertising. Michel Foucault's work will be used as a theoretical base, which describes the means in which voters are manipulated through the process of making rational decisions and judgments. This idea has been used in scholarly works to assert that campaigns and elections actually have no truth within them at all; rather, they are merely manifestations of repetitive and strategic media. Moreover, a postmodern view of voters' rationalization "views the voter to be entrapped in a number of previously created political 'discourses' - defined here as the structuring of reality or the web of historical, social, political, linguistic and cultural forces which shape the world" (Kates 1873). The paper will draw upon this idea to test whether the "cultural forces" and "structuring of reality" include ways that political candidates and their spouses are presented in the media. Furthermore, it will explore if the way sexuality is portrayed in politics influences or perpetuates the acceptance of social norms, such as heterosexuality and gender roles.

WITH THE AUTHORITY OF THE SPIRIT: FEMALE PREACHING AT THE AZUSA STREET REVIAL, 1906-1908
Zachary Johnson
Location: Ballroom, 1:30 PM - 3:30 PM
Category: Humanities and Peforming Arts, Poster
Mentor(s): Amy DeRogatis (Religious Studies)
This poster presentation will display the results and conclusions of research undertaken as a part of the Religion 491 course on Evangelicalism in the United States. My research focused on the Pentecostal revival that took place in Los Angeles between 1906 and 1908, known as the Azusa Street revival. An investigation of the revival's newsletter, The Apostolic Faith, reveals numerous records and testimonies of women speaking, praying, and, most importantly, preaching in 'tongues' - that is, in foreign languages inspired by the Holy Spirit. These testimonies show that Pentecostal's theological and religious belief in the gift of tongues allowed women flexibility and freedom within at Azusa Street and beyond. This study is, furthermore, important for the study of Evangelicalism more generally: the stories preserved in The Apostolic Faith show that Evangelicals, while known for being traditional, have, at times, challenged the very ideas of gender and gender roles upheld by society.

CREATIVE THINKING TOOLS
Travis Jones
Location: Gold Room, 9:30 AM - 11:30 AM
Category: Education-Section 1, Poster
Mentor(s): Robert Root-Bernstein (Physiology and Natural Science)
Problem: There are thirteen creative thinking tools proven to facilitate learning: observing, imaging, abstracting, pattern recognition, pattern forming, analogizing, body thinking, empathizing, dimensional thinking, modeling, playing, transforming, and synthesizing The evidence of this lies in the tools' presence in the works of history's greatest minds; however, in science textbooks, either none or only the same few of these tools are found. Hypothesis: As the grade level of textbooks progresses, the more objective tools will remain while the number of more subjective tools will diminish. Methods: The "tool content" of textbooks from grades three, four, five, seven, and ten were evaluated by groups of three to four students. Each student used a chart to keep a log of the number of tools located and the context in which they were found (i.e. text, caption, illustration, index, etc.). For each book, a "summary chart" was created from each student's individual chart. This data was compared to the various textbooks. Results: The books from the youngest grade level contained the most tools while the books from the highest grade level contained the least. Most of the tools were present throughout the elementary and middle school textbooks. It was at the high school level that the tools really diminished. Thus, the tools did not diminish as evenly as expected, but the fact that the highest grade level had the least and the lowest had the most tools was consistent with the hypothesis.

AN EXPERT'S WORLD: WHAT DO PRESCHOOLERS BELIEVE ABOUT EXPERTS?
Meghan Kanya, Courtney Sharp
Location: Ballroom, 9:30 AM - 11:30 AM
Category: Psychology-Section 1, Poster
Mentor(s): Judith Danovitch (Psychology)
Our study investigates how children (ages 3-5) reason about knowledge and expertise. Specifically, we are examining whether children believe that the ease of learning a topic is related to a person's level of expertise in a subject. We are also examining whether children assume an expert in one area will be an expert in other areas. To address these questions, we are presenting each child with two puppets. One puppet is described as an expert on dogs, while the other is a person with no specific expertise. The children are first asked a set of control questions to ensure they understand which puppet is meant to be the expert. The children then observe the puppets "learning" about another area, either related (cats) or unrelated (cars) to the expert's area of expertise, depending on the condition, and children are asked a series of questions about who they think learned the new information better. Each puppet will then present a novel name for a related object (cat), an unrelated object (car), and a random object (fruit), and the children will be asked to endorse the name they think is correct. The results will allow us to understand more about how children of different ages think about expertise. By analyzing the results, we can learn more about how children think about the relationship between what a person already knows and the ease of learning new things, which may have implications for educational techniques.

CORRELATING BACTERIAL SURVIVAL WITH MOLAR CONCENTRATION OF UNCHARGED ORGANIC ACID
Binafza Kapadia
Location: Ballroom, 1:30 PM - 3:30 PM
Category: Microbiology, Immunology, and Infectious Disease-Section 3, Poster
Mentor(s): Daniel Dougherty (Statistics)
The buffering properties of organic acids play an important part in determining the antibacterial and acid stress response of Escherichia coli and Staphylococcus aureus. E. coli and S. aureus are pathogenic bacteria that are known to contaminate animal feed and feed raw material. To increase feed shelf life, organic acids are increasingly being utilized as substitutes for antibiotics against these pathogenic bacteria. To minimize potential negative impacts on livestock, it is of interest to predict the dose-response relationship between acid concentration and observed cytotoxic effects. We carried out an in vitro study that replicated typical end-product conditions of E. coli and S. aureus in brain-heart infusion (BHI) medium. We supplemented BHI with .5% and 1% (by weight) of either ascorbic, lactic, or acetic acid. Acid-base titrations were then carried out and replicated to characterize the effect of the acidulant, batch-to-batch variability, measurement error, and other sources of variability. Statistical models were created for each acidulant and their BHI mixtures using the jpHtools software and stored in an online SQL database. The range of percent variability in survivability explained by total molar concentration varied across acidulants (23.9%-93.4%). Our project explores the correlation between uncharged molar concentration and survivability. In the future, this repository may provide a framework for the creation of predictive models of E. coli and S. aureus cytotoxicity in animal feed and in vivo.

GESTURING EXPERTISE?: AN INVESTIGATION OF ENACTMENT GESTURE IN ROCK CLIMBERS
Julia Kartush
Location: Gold Room, 1:30 PM - 3:30 PM
Category: Social Science: General-Section 3, Poster
Mentor(s): Jan Anderssen (Linguistics), Suzanne Wagner (Linguistics)
Gestures contribute and supplement information during discourse, creating an important part of communication. Social factors influence the way in which communication systems develop. I would like to examine how a small, close-knit expert community uses a specialized gestural communication system and also investigate how this system develops, as affected by different social factors. This study focuses on a community of eight Michigan rock climbers who have been climbing from six months to ten years. They are speakers of Standard American English, whose ages range from twenty to thirty years old. Through naturalistic observation and sociolinguistic interview, the subjects' gestures are captured on digital video. The research pinpoints the special set of enactment (mime-like) gestures that the subjects utilize in the discussion of climbing-related topics. These gestures may range from more literal imitation gestures to those that are abstractions of the information which they communicate. Do gestures become higher quality or more codified with increasing expert knowledge? The development of symbolic communication is explored through an analysis of manifestations of the climbers' set of enactment gestures on a continuum. Dissection of this micro-community of rock climbers may reveal interesting insights regarding the correlation of enactment gesture type and climbing expertise.

EXPERIMENTAL EVOLUTION OF E COLI IN CHANGING ENVIRONMENTS
Mark Kauth
Location: Ballroom, 1:30 PM - 3:30 PM
Category: Microbiology, Immunology, and Infectious Disease-Section 4, Poster
Mentor(s): Jeffrey Barrick (Microbiology), Richard Lenski (Microbiology)
A generalist species is able to proliferate in a variety of environments using various resources. A specialist species can survive in few environments, and is able to use a narrow range of resources. There may be a fitness trade-off for specialists to be successful in one environment versus another. Using different strains of Escherichia coli bacteria, we have performed a long-term evolution experiment for 128 days in fluctuating environments to evaluate this trade-off. To change the environments, the primary sugar (glucose and galactose) present in the medium was changed at specific time intervals. If a trade-off exists, then we expect specialists evolved on just one of the carbon sources to achieve a higher fitness on that carbon source than any of the strains that experienced a changing environment. If this trade-off is not observed, we expect some of the strains that evolved under environmental changes at intermediate time intervals to achieve just as high of a fitness in each sugar as strains evolving in a constant environment. It is also possible that an optimal time interval of environmental change can result in a more rapid increase in fitness on both carbon sources. This increase is due to alleviating the effects of clonal interference because only some of the mutations that increase fitness in glucose will also increase fitness in galactose, so these can quickly sweep through the population after an environmental change. Further analysis is currently being performed to evaluate these hypotheses.

COOPERATION AMONG WOMENS ORGANIZATIONS: THE CASE OF TURKEY
Andrew Keller
Location: Gold Room, 9:30 AM - 11:30 AM
Category: Social Science: General-Section 1, Poster
Mentor(s): Katherine Meyer (Sociology)
Networking among women's organizations in Turkey from 1990 to the 2009 has seen significant growth and momentum as reforms on gender equality and women's rights have passed. This 19 year period includes major events, such as the passing of the Penal Code Reform and the Civil Code Reform, which greatly altered the status of women in Turkey. It also follows the end of a large feminist movement during the late1980's which largely failed to gain international attention. Looking at trends in growth, and location of these organizations helped to determine who is benefiting, and participating, in these organizations as well as the extent to which they are able to successfully mobilize support for gender reforms. The conglomeration around a single issue saw the success of certain initiatives, while other reforms ultimately failed. The various ways in which these organizations sought to address an issue centered on the success of a single organization or the ability of multiple organization to work in conjunction. In addition the deep divide between religious and secular organizations solidified as opposition from the government, and responses from the international community influenced the extent to which these organizations were allowed to operate. The increasing interconnectivity of these women's organizations saw more attempts at reforms and increasing concentrations around central issues.

WILD WHITE MAN: WILLIAM BUCKLEY AND THE FOUNDING OF MELBOURNE
Mark Kelly
Location: Tower Room, 9:45 AM
Category: History, Political Science, and Economics, Oral
Mentor(s): Benjamin Smith (History)
In 1803, William Buckley escaped from the Port Phillip convict colony (near present day Melbourne)-an event promptly forgotten two months later when the colony folded. Thirty years afterward, when a private group of settlers returned to the shores of southern Australia to found a new colony, they were startled to discover a bearded white man, wrapped in an opossum-skin coat, living in the bush. Over the next few weeks, as Buckley slowly regained a passable knowledge of English an incredible story of survival and cross-cultural interaction would be told. However, Buckley's story does not end with his rediscovery. The colonists of Port Phillip quickly realized his value as both an interpreter to the natives they wished to take land from as well as a symbol of the social dangers embedded in the imperial project. Buckley, over the next two years, would be lauded as an idealized Robinson Crusoe-type explorer, able to maintain his Englishness in a hostile and savage wilderness, be utilized pragmatically as a central cog in the imperialist machine, as pastoralist settlers engaged in the fastest colonization project in world history, and finally discarded and dehumanized as a disloyal, traitorous, and barbaric creature. Throughout this flurry of controversy-fueled by newspapers, diaries, public and private letters, and contemporary histories-an image of Buckley emerges: a simple and decent man cast adrift by the inexorable power of history, an allegory for the real human effects of ruthless imperialism.

CO-OPTING FLATULENCE: THE CHANGING SIGNIFICANCE OF FARTS IN THE SUMMONERS TALE
Mark Kelly
Location: Lake Huron Room, 1:00 PM
Category: Humanities and Peforming Arts-Section 2, Oral
Mentor(s): Teresa Tavormina (English)
Geoffrey Chaucer's Summoner's Tale has traditionally been considered a simple fabliau-puerile, crude, and ultimately bereft of any greater significance. However, since 1971, when Alan Levitan published "The Parody of Pentecost in Chaucer's Summoner's Tale," scholars have approached the tale anew, finding amongst the tale's central flatulence an allegory or satire of medieval religious practices. Others have interpreted Chaucer's use of flatulence in the opposite way, as an allusion to the increasingly scientific temper of his times and the rise of an empirically-based epistemology. I argue for a third layer of allegory that synthesizes both the religious and the scientific interpretation of flatulence into parallel forms of false absolutism. Although flatulence is treated at the beginning of the tale as either demonic or divine wind-as it had been traditionally treated throughout the medieval period-the squire's employment of logic against the seemingly insoluble problem of dividing a fart, geometrically apportioning the gas into equitable sections, suggests the power of the growing medieval scientific imagination to illuminate the world in ways religion might be unable to, while simultaneously implying the ultimate silliness of scientific reason. The Summoner's Tale can therefore be treated as a commentary on the subtle changes in the intellectual environment of Chaucer's time, where the contrasting epistemologies of religion and science seemed to be in increasing competition, and an appeal for a more moderate, indeed anti-intellectual, form of pragmatic truth-knowing.

FROM THE SILK ROAD TO THE LIBRARY: ENGENDERING THE SILK ROAD THROUGH A PUBLIC INSTITUTION
Roxanne Kieme
Location: Lake Huron Room, 11:15 AM
Category: Humanities and Peforming Arts-Section 1, Oral
Mentor(s): Catherine Ryu (Linguistics and Languages)
This project examines how the globally recognized idea of the Silk Road is locally consumed by way of world music through the use of a public institution. World music is a term used to categorize non-western music by westerners, which in turn acts as a form of 'othering' (which is when one culture forms the identity of another as different from their own). To understand how this takes place within a public library, I will examine how the identity of the Silk Road has been created for the public's use. How is the music of the Silk Road categorized and accessible? How is the album itself produced and constructed? What kind of identity does the music portray? The answers will show that othering takes form in each perspective. An ongoing hypothesis is that the representation of Silk Road music is being created by the library, and that the public is absorbing an identity of Silk Road Music through many different filters caused by othering. Although Silk Road music can be interpreted in different ways, how it is given to the public must be taken into consideration when learning about a culture.

DEFORESTATION AND NITROGEN LEVELS IN MICHIGAN INLAND LAKES
Nicole Kiriazis
Location: Ballroom, 9:30 AM - 11:30 AM
Category: Physical Sciences, Poster
Mentor(s): David Long (Geological Sciences)
It has been observed in previous studies that nitrogen levels in inland freshwater lakes decrease over time and then recover. This study aimed to find the cause of this trend and determine if it occurs in different environments in Michigan. Our hypothesis was that the decrease was caused by deforestation as terrestrial plants used the nitrogen for landscape recovery. To test this hypothesis, nitrogen concentrations over time were compared to aluminum levels, which indicate deforestation events. Lakes from several different areas were analyzed to see if the trend is similar throughout Michigan. The data were taken from sediment cores and analyzed for element levels, with ^{210}Pb levels analyzed to determine the sediment ages. The results show that the nitrogen trend occurred in all of the lakes. However, the recovery occurs in varying time frames and the decrease does not always correlate with Al peaks. This may be due to the differing geology of southern and northern Michigan, but further analysis will be needed to test this.

REGIONAL AND NATIONAL EFFORTS TO COMBAT ASIAN CARP INFESTATION
Ashley Kitts
Location: Ballroom, 9:30 AM - 11:30 AM
Category: Environmental and Natural Resources-Section 1, Poster
Mentor(s): Matt Grossman (Political Science)
In this project, I look into all of the efforts that have been used to eliminate Asian carp from the Great Lakes and keep them from spreading into all of the Great Lakes. I am going to start from the beginning, when the carp first got into the Great Lakes, and go into how they began to spread. I will discuss the dangers of the Asian carp, and why it is such a big deal if they end up invading the Great Lakes. I am going to talk about how they will destroy the natural habitat of the Great Lakes, and also cause damage to the boating and fishing industries. I am going to have a graphic display of the Asian carp, and show videos of the havoc that is caused by Asian carp when they infest a body of water. I also plan on looking into the interstate conflict that has arisen because Illinois does not want to close the lock that connects the Illinois waterways to Lake Michigan. I am also going to look into similar interstate conflicts that have occurred in the past. I am going to discuss the reasons why the Supreme Court would take Illinois' side over the other states that have banded together to pressure Illinois to close the locks.

A GLOBAL VIEW ON MARINE DEBRIS
Gabrielle Kleber
Location: Ballroom, 1:30 PM - 3:30 PM
Category: Environmental and Natural Resources-Section 2, Poster
Mentor(s): Laurie Thorp (RISE Program)
Fourteen beaches among nine coastal areas within Hawaii, Australia, the Maldives, South Africa, England, Wales and Iceland were surveyed for accumulation of marine debris between May and August of 2009. The surveys focused on approximating the volume and assessing the general composition of litter at each location as well as establishing the origin of the items and any ecological or socioeconomic impacts caused by the debris. While the amount of trash regularly found at each location could not be concluded from this report, the variety of items was evaluated. Plastic was determined to be the most common material found at nearly all of the survey locations, accounting for up to 90% of the items recorded. The origin of debris varied between sites due to differing maritime and shore-line activities, cultural norms, and location amid current systems. Trash deposited or abandoned from the fishing industry as well as items with terrestrial origins were among the most frequent types of debris found. The social and environmental implications of coastal litter was unique to each location, ranging from infestation of termites from foreign timber into the local lumber industry, to unsightly beaches impacting the tourism industry.

BIOSYNTHESIS OF POLY-HYDROXY-VALERATE BY PSEUDOMONAS PUTIDA
Yelena Kleshchik
Location: Ballroom, 9:30 AM - 11:30 AM
Category: Microbiology, Immunology, and Infectious Disease-Section 1, Poster
Mentor(s): Michael Bagdasarian (Microbiology and Molecular Genetics)
The purpose of this project is to understand the biochemical pathways involved in the unique ability of Pseudomonas putida KT2440 to utilize levulinic acid as a sole carbon source. Understanding its ability to convert this carbon source to poly-hydroxy-alkanoates (PHA), a precursor for biodegradable plastic, will allow for optimization of the use of levulinic acid for production of the PHA polymers. To determine the genes responsible for such growth, we have isolated two mutants that utilize glucose, but not levulinic acid as a sole carbon source. To generate these mutants we used a transposon encoding resistance to Gentamicin and the ability to replicate in certain E. coli strains. Sequencing of the region into which the transposon has inserted showed that, in one of these mutants, the insertion is in the gene PP_2793. The sequence of the second mutant is under investigation. The PP_2793 gene is presumed to encode acyl-CoA-dehydrogenase, which is part of a cluster containing 2 other genes of fatty acid metabolism, PP_2794 and PP_2795, believed to encode Acyl-CoA-oxidoreductase and Acyl-CoA-synthetase, respectively. The proximity of these genes to one another suggests that they may be part of an operon, generating great interest in their function. A clone containing PP_2793 and PP_2794 genes was created, and a complementation test showed that the two genes alone are not sufficient to complement the insertion mutant for utilization of levulinic acid as the sole carbon source. A clone containing all three genes is currently being synthesized.

2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN (TCDD) SUPPRESSES LPS-ACTIVATED BINARY SWITCHING OF B CELLS TO PLASMA CELLS
Douglas Kline
Location: Ballroom, 9:30 AM - 11:30 AM
Category: Microbiology, Immunology, and Infectious Disease-Section 1, Poster
Mentor(s): Norbert Kaminski (Pharmacology and Toxicology)
Impairment of B cell differentiation by TCDD is well established. Based on the gene regulatory network that underlies B cell differentiation, we hypothesized that a transcriptional bistable switch underlies B cell activation and TCDD disrupts the switching process. A computational model of the network shows that this switch can generate the two mutually exclusive transcriptional profiles corresponding to the B cell and plasma cell states. Using flow cytometry lipopolysaccharide (LPS)-activation yields two distinct cell subsets (a bimodal distribution), supporting the idea of an underlying biological switch. The cells exhibited either a resting B cell-like phenotype with low intracellular IgM (IgM^{low}), or a plasma-cell like phenotype with high intracellular IgM (IgM^{high}). The average IgM levels in these two populations differed by two orders of magnitude. Fewer than 5% of total B cells exhibited intermediate intracellular IgM. This nearly binary IgM response to LPS was both concentration- and time-dependent, with maximal number of IgM^{high} cells observed at $\geq$ 5μg/ml LPS at 72 h post activation. Suppression by TCDD of the IgM response in LPS-activated B cells occurred through a reduction in the total number of IgM^{high} cells rather than a reduction in intracellular IgM levels. The reduction in the number of LPS-stimulated IgM^{high} cells was TCDD concentration-dependent and was up to 50% of the control. In summary, we confirmed that conversion from a naïve B cell phenotype into a plasma cell phenotype is a discrete, switch-like process, and that by disrupting this process, TCDD suppresses the probability with which B cells differentiate to plasma cells.

EFFECTS OF MARINATION TREATMENT AND FREEZETHAW CYCLES ON UPTAKE RATE AND COOKING YIELD OF WHOLE-MUSCLE BEEF, TURKEY, AND PORK

Anthony Klingler

Location: Ballroom, 1:30 PM - 3:30 PM

Category: Agriculture and Animal Science, Poster

Mentor(s): Bradley Marks (Agricultural Systems and Bioengineering)

Marination is a common method to enhance texture, flavor, color, and yield of meat products. Although the practice is widespread, there is very little published work quantifying uptake rate and retention after cooking of products subjected to sequential freeze/thaw cycles. Therefore, the objective of this study was to quantify the rate of mass gain, and subsequent cooking yield, for whole-muscle products subjected to marination treatments and 3 freeze/thaw cycles. Intact turkey breast, pork loin, and beef top round roasts (~500 g) were treated fresh or after 1,2, or 3 freeze/thaw cycles. Roasts were then cut into ~15 g samples that were submerged in: (1) water, or (2) a salt (7.7%) and phosphate (3.8%) solution, in a stirred beaker for 3, 9, or 27 min at 4C. Samples subsequently were cooked in sealed bags in a water bath, ramped from 48.8 to 72.8°C over 80 min and pulled once the internal temperature reached 68.8°C. The uptake of the salt/phosphate marinade into turkey was greater than into the pork and beef. For all species, the uptake for the water treatment was not different from the salt/phosphate treatment; however, the post-cook yield for the water treatment was significantly less than both the salt/phosphate and control treatments. In pork and turkey, cooking loss rose steeply after the first freeze/thaw cycle and leveled off for each subsequent cycle. In beef, cooking loss was unaffected by freeze/thaw cycles. These results will help optimize commercial marination processes, which can lead to improved processing economics.

THE MYERS-BRIGGS TYPE INDICATOR (MBTI): IMPLICATIONS IN THE WRITING CENTER

Deanna Koenig

Location: Ballroom, 9:30 AM - 11:30 AM

Category: Communication Arts and Sciences, Poster

Mentor(s): Trixie Smith (The Writing Center)

The Myers-Briggs Type Indicator (MBTI) is a well-validated, reliable test that yields one of 16 possible four letter combinations, each representing one type. Each type describes an individual's behavioral tendencies in a wide variety of situations, including writing and tutoring. This study assessed the MBTI types of consultants at the MSU Writing Center and investigated potential problems that may arise from tendencies associated with their MBTI type. Each individual has a different type (either different letter combinations or different strengths in terms of tendencies), which could lead to issues such as consultants having different session priorities than clients. Data was collected via questionnaires on overall client and consultant satisfaction after Writing Center sessions and was used to design a training session for consultants. The training included analysis of MBTI types and tendencies and introduced techniques for avoiding problematic sessions. This was expected to improve consultants' ability to aid all clients, regardless of MBTI type. After training, client satisfaction with sessions was assessed again; data was analyzed and showed that the training caused a significant improvement in overall satisfaction with Writing Center conferences.

ANALYSIS OF THE ASPECTS OF MOVEMENT AND PHYSICALITY CHOICES FOR EFFECTIVE PERFORMANCE IN SHAKESPEAREAN THEATRE

Beth Kolongowski

Location: Ballroom, 1:30 PM - 3:30 PM

Category: Humanities and Peforming Arts, Poster

Mentor(s): Chaya Gordon-Bland (Theatre)

This research project aims to achieve a more complete understanding of the aspects of theatrical movement that contribute to truthful and engaging acting techniques and theatrical presentation. Utilizing several professional productions of "The Winter's Tale" by William Shakespeare as a framework, this project's objective will be to develop and apply a systemized process of evaluating movement elements and their effectiveness onstage. The project will involve research into the current literature on movement analysis, gaining affiliations into professional theatrical organizations, attending workshops or conferences that emphasize a specific school of theatrical movement, interviews with experts in the field and those directly involved in the productions, viewing and analyzing national productions of Shakespeare plays, and completing a final paper that will be submitted for presentation and/or publication. The overall picture obtained will present a novel perspective on the subject of theatrical movement, defining both the effectiveness of certain kinesthetic choices as well as an expanded vocabulary for evaluating and discussing theatrical movement that can be employed in the areas of theatrical scholarship, education, outreach and performance.

VITAMIN E DEFICIENCY IN BALBC MICE DURING PREGNANCY AND POST-NATAL PERIODS LEADS TO ENHANCED ALLERGIC AIRWAY RESPONSES IN OFFSPRING

Jessica Konal

Location: Ballroom, 1:30 PM - 3:30 PM

Category: Microbiology, Immunology, and Infectious Disease-Section 3, Poster

Mentor(s): Norm Hord (Food Science and Human Nutrition), James Wagner (Pathobiology and Diagnostic Investigation)

Epidemiological studies in humans suggest that vitamin E (VitE) deficiency during pregnancy and early development can promote adverse airway and allergic responses in children. We fed pregnant mice diets of varied VitE (alpha-Tocopherol; alpha-T) with either VitE-sufficient (50mg alpha-T/kg diet), VitE-deficient (8mg/kg), or VitE-enriched (400mg /kg) during breeding, pregnancy and nursing to test the hypothesis that dietary VitE during in utero and postnatal periods can modulate allergic airway responses in offspring. Weaned mice (age 21d) were then maintained on these same diets. At age 31d mice were sensitized to ovalbumin (OVA) by intraperitoneal (IP) injection with 20Âµg OVA and 20mg alum in 0.25ml saline, and then boosted at age 41d. At age 48d mice were challenged by intranasal instillation with 50Âµl of 0.5% OVA. Twenty-four hours after OVA challenge, lungs were lavaged with saline to collect bronchoalveolar lavage fluid (BALF), and then processed for morphometric analyses of intraepithelial mucosubstances (IM). OVA challenge caused significant increases in BALF cellularity and IM in mice on sufficient diets. In mice on VitE-deficient diets by comparison, allergic responses were further enhanced compared to the sufficient group,

specifically in BALF eosinophils and lymphocytes, as well as in IM. Supplementation with alpha-T did not affect BALF inflammatory cells, but IM was attenuated in these mice compared to mice on sufficient diets. Our results in mice provide biological plausibility that in utero and early life dietary VitE intake can influence the development of allergic airways disease.

BLOOD AND THE IMMUNE SYSTEM: THE KEEPERS OF GOOD HEALTH
Gautam Korakavi
Location: Gold Room, 1:30 PM - 3:30 PM
Category: Cell Biology, Genetics, and Genomics-Section 3, Poster
Mentor(s): Carl Boehlert (Engineering)
Every day we are exposed to pathogens whether we notice them or not, and our bodies unconsciously eliminate them. Most people just see and feel the symptoms of illness, but pathogens might have entered the body a long time ago. What is in our bodies that help us get rid of disease and stay healthy? In this presentation I will address what goes on inside the body on a cellular level. Additionally, I will break down the composition of blood and show how it plays a role in keeping good health. I am interested in the immune system because a good understanding of it will allow us to create new medicines to combat evolving pathogens in the future. The mechanisms of viruses, bacteria, and parasites will be addressed as well as mechanism of the HIV virus. Readers should be able to clearly understand the mechanisms of disease and how our bodies go about defeating it.

ORIENTALIST NEVER-ENDING PRESENCE IN SILK ROAD NARRATIVES
April Korneli
Location: Lake Huron Room, 10:15 AM
Category: Humanities and Peforming Arts-Section 1, Oral
Mentor(s): Catherine Ryu (Linguistics)
This study examines how the perceptions of the Silk Road are arbitrated by the media, such as travel brochures and historical narratives, which Western culture produces and consumes. By using popular literature as a lens, the view of Eastern culture by Western culture is examined as well as how these judgments shape assumptions about the Silk Road. To carry out this study of perceptions about the Silk Road, I am investigating narratives about the Silk Road such as Sven Hedin's "Central Asia, Tibet" in 1903 and of Colin Thurbron's "Shadow of the Silk Road" in 2006. These narratives serve as a background in which to analyze a Western modern travel website and an Eastern modern travel website. This analysis will illuminate how the notion of the Silk Road has changed. My research will focus on the relationship between the perception of the Silk Road and the signifying practice of those representations, as embedded within the structure of the narratives such as metaphors, narrative voice, structure, and perspective. My working hypothesis is that Orientalism, as defined by Edward Said, exists in the travel narratives and contributes to the misperceptions assumed about the Silk Road, hence, reinforcing Orientalism.

TOXICITY AND TREATABILITY OF AGRICULTURE AND FOOD PROCESSING WASTE WATERS
Kevin Koryto
Location: Ballroom, 1:30 PM - 3:30 PM
Category: Environmental and Natural Resources-Section 2, Poster
Mentor(s): Dawn Reinhold (Biosystems Engineering)
The focus of this study is to investigate the possibility of using aquatic plant systems to treat waste waters from agricultural and food processing facilities. The goal of the project is to quantify a duckweed systems ability to treat waste waters on two parameters, toxicity and treatability. This will be done by comparing results from three to five waste waters and applying a design model. To analyze toxicity three different techniques, frond counts, chlorophyll analysis, and oxygen production rate assessments, will be compared on the basis of time, cost, and effectiveness. Oxygen production rate assessments will be used to compare toxicity between the waste waters. Treatability will be measured through nutrient removal rates by measuring phosphorous, nitrogen, and COD over a seven day exposure.

GROWING THROUGH THEATRE: DRAFTING THE MICHIGAN THEATRE GRADE LEVEL CONTENT EXPECTATIONS
Kathryn Kosko
Location: Tower Room, 3:15 PM
Category: Education, Oral
Mentor(s): Joni Starr (Theatre)
After observing a kindergarten classroom dramatize The Three Billy Goats Gruff it was clear how the value of theatre impacted the students' growth and development. The students were able to gain a deeper understanding of themselves and others through creating new characters and new worlds. Theatre education can play a central role in our schools. It allows for primary engagement through verbal, kinesthetic and aural means. This project focuses clearly on these means by updating the Michigan Theatre Grade Level Content Expectations (GLCEs) for kindergarten through eighth grade. Data was collected from other state Theatre curricula and sorted based on the existing National Theatre standards and the state of Michigan benchmarks. This data, coupled with Theatre educators' expertise, informed and contributed to the update of the standards. This project has culminated in a draft of the Michigan GLCEs that will serve as a first step in the final publication of the Michigan Theatre curriculum.

DOES NATURAL TASTE BETTER: A SENSORY INVESTIGATION OF NATURAL AND ARTIFICIAL FLAVORS IN ICE CREAM
Justin Koziatek, Lauren Burke, Elisabeth Gustafson, Sara Jones, Lindsay Kariniemi
Location: Ballroom, 9:30 AM - 11:30 AM
Category: Health, Food, and Wellness, Poster
Mentor(s): Janice Harte (Food Science and Human Nutrition), Zeynep Ustunol (Food Science and Human Nutrition)
Currently, natural is not officially defined by the FDA, leaving consumers to construct uneducated definitions. As a result of consumer perception, an unclear division exists between natural and artificial products. The main goal of this research is to determine if the average consumer prefers ice cream made with artificial or natural flavor. For preliminary data on consumer perception, a focus group and online

survey were conducted. The focus group of 10 participants included Food Science and Nutrition graduate and undergraduate students and a senior Food Science faculty member. The online survey had 45 responders consisting of average consumers, mainly family and friends. According to the survey, 77.8% of consumers do not read the ingredient label when purchasing ice cream. And, when asked whether they would purchase an ice cream with natural flavors, artificial, or either, 68.9% chose natural. This method further involves a controlled, blind sensory acceptance test with a preference question. The organoleptic attributes: appearance, mouth feel, flavor, and overall acceptance are rated on a 9-point hedonic scale. Four flavors will be tested: natural vanilla, artificial vanilla (vanillin), natural strawberry, and artificial strawberry. Product will be prepared using Vanilla and Strawberry ice cream formulations in a five-gallon batch freezer.

IN THE MOMENT
Andy Kozlowski, Paul Knechtges
Location: Green Room, 1:00 PM
Category: Digital Media-Section 2, Oral
Mentor(s): Bob Albers (Telecomunications)
This feature length documentary focuses on the psychology and science behind being "in the moment". Being in the moment means something different for everyone and has an application in almost any activity one can do. It is most obviously seen in the sports or music worlds. When an athlete or musician is at the pinnacle of performance they enter their "zone", it is in this zone that they block out all other mental thoughts besides what they are doing at that very moment. This documentary is in its very beginning stages, we have recorded musicians performing and interviewed them about what it means to them to be in the moment. We plan to explore other applications such as combat and warfare, emergency services, and any other event in which quick and critical action is necessary.

ELDERLY INSTRUMENTS
Andy Kozlowski, Brad Corlett, Paul Knechtges
Location: Green Room, 2:15 PM
Category: Digital Media-Section 2, Oral
Mentor(s): Bob Albers (Telecommunication)
"Elderly Instruments" takes a look into the Old Town Lansing music shop and brings the people and instruments full circle with the culture that comes along with working and shopping there.

DISSOLVED OXYGEN SENSING FILMS FOR BIOLOGICAL APPLICATIONS
Sage Kramer
Location: Parlor C, 11:15 AM
Category: Environmental and Natural Resources, Oral
Mentor(s): Ruby Ghosh (Physics and Astronomy)
In controlled aquaculture environments, such as fish ponds or breeding tanks, the level of dissolved oxygen on a given day fluctuates tremendously and is dependent on many factors including: level of fish activity, temperature, flow rate, water depth, ambient pressure, salinity, and pH. As one would imagine, maintenance of an optimal dissolved oxygen level is vital in maximizing fish growth and minimizing mortality rates. The enormous demand for the ability to quantitatively measure dissolved oxygen levels has led to the production of many types of dissolved oxygen sensors. In general there are two categories: photochemical, or Clark electrodes, and optical. In recent years there has been a strong preference for optical sensors because they do not require the consumption of oxygen, show no signs of flow dependence, and are not easily poisoned by ambient organic matter. For a variety of other reasons a molybdenum-chloride, or similar metal-halide based luminophore seems to be well-suited for dissolved oxygen sensing. The focus of this presentation is on the process of producing a practical and inexpensive sensing film that will allow for *in-vivo*, accurate, real-time measurements of dissolved oxygen.

EVALUATING CHANGES IN NEUROCOGNITIVE FUNCTION FOLLOWING CONCUSSION IN SPORT
Jonathan Krause, Katie Brandl, Mark Kidwell
Location: Tower Room, 2:45 PM
Category: Education, Oral
Mentor(s): Tracey Covassin (Kinesiology)
Concussions remain a serious public health concern with approximately 1.6 to 3.0 million sport concussions occurring every year in the United States. Sports medicine professionals have recently promoted computerized neurocognitive testing as one objective component in a comprehensive concussion management approach. The purpose of the study was to conduct a preliminary analysis of neurocognitive performance in a sample of high school and collegiate athletes before and after a concussion. A repeated measures design was used to compare baseline and post-concussion neurocognitive test scores. The independent variable was time (baseline, Day 2 post-concussion). The dependent variables were verbal memory, visual memory, reaction time, and motor processing speed. Approximately 1,000 collegiate and high school athletes participating in a multi-site, sport-concussion surveillance project were recruited for study. The Immediate Post-Concussion Assessment and Cognitive Testing (ImPACT) computer program was used to assess neurocognitive function. Concussed athletes (n=58) completed a baseline and 2-day post-concussion ImPACT test. A repeated measures MANOVA was conducted to evaluate ImPACT neurocognitive performance. Statistical significance level was set a priori of $p < .05$. Wilks' Lambda revealed a multivariate within-subjects effect (time) on ImPACT performance ($\lambda = .60$, $F(2,54)=4.73$; $p<.001$). More specifically, concussed athletes demonstrated a significantly lower verbal memory score ($p=.01$) at 2 days post-injury. These findings demonstrate the utility of computerized neurocognitive testing in assessing cognitive function following concussion.

THE RED VIOLIN CAPRICES FOR VIOLIN SOLO
Margarita Kreine
Location: Parlor C, 1:30 PM
Category: Humanities and Peforming Arts, Performance Demonstration
Mentor(s): Dmitri Berlinsky (Music)
These Caprices by John Corigliano, composed in conjunction with the score for François Girard's film The Red Violin, take a spacious, troubadour-inspired theme and vary it both linearly and stylistically. These variations intentionally evoke Baroque, Gypsy, and arch-Romantic idioms as they examine the same materials (a dark, seven-chord chaconne as well as that principal theme) from differing aural viewpoints. The Caprices were created and ordered to reflect the structure of the film, in which Bussotti, a fictional 18th-century violin maker, crafts his greatest violin for his soon-to-be-born son. When tragedy claims his wife and child, the grief-stricken Bussotti, in a gesture both ardent and macabre, infuses the blood of his beloved into the varnish of the instrument. Their fates thus joined, the violin travels across three centuries through Vienna, London, Shanghai and Montréal, passing through the hands of a doomed child prodigy, a flamboyant virtuoso, a haunted Maoist commissar, and at last a willful Canadian expert, whose own plans for the violin finally complete the circle of parent and child united in art.

CHARACTERIZATION OF PALLADIUM-IRON NANOPARTICLE CATALYSTS
Ben Kremkow
Location: Gold Room, 9:30 AM - 11:30 AM
Category: Engineering, Computer Sci, and Math- Section 1, Poster
Mentor(s): Ronald Andres (Chemical Engineering)
Certain bimetal catalysts exhibit a greater effectiveness than the individual metal catalysts. The palladium and iron bimetal catalyst has shown potential of this increased effectiveness, and has demonstrated an increased efficiency in cleaning contaminated water and soil, especially chlorine-rich contaminants. This bimetal catalyst has demonstrated potential in the petrochemical and chemical industries, specifically the water-gas shift reaction. Catalyst synthesis mechanisms vary and aerosol arc evaporation is the novel technique under investigation. It is proposed bimetal nanoparticle catalysts are produced quicker and more efficiently. Various weight percent combinations of palladium/iron bimetal nanoparticles were created, adequate analysis techniques were determined, and the catalyst effectiveness was determined. Several preparation techniques for Inductively Coupled Plasma mass spectroscopy analysis, ICP, were analyzed and a new, optimal technique was developed. Transmission Electron Microscopy, TEM grids were analyzed at different magnifications to determine the particle size distribution and lattice spacing of the molecules. Catalyst experiments were performed for the catalysts in the water-gas shift catalysis reactor. The ICP and TEM analysis methods determined the optimal quench gas and flow rates that minimize the size distribution. The digital images of the samples with larger weight percentages of palladium are currently being analyzed and catalytic experiments are being conducted and analyzed. The results will determine if the new synthesis method is a less time intensive way exists to create bimetal catalysts and whether the catalysts are more effective.

FREQUENCY DIVISION USING A MECHANICAL STRUCTURE
Ashley Kulczycki
Location: Gold Room, 9:30 AM - 11:30 AM
Category: Engineering, Computer Sci, and Math- Section 1, Poster
Mentor(s): Steven Shaw (Mechanical Engineering)
With mechanical devices becoming smaller and smaller, it is hoped that a mechanical device could replace an electrical circuit as a frequency divider. Modeling such a mechanical device with fewer losses than an electrical circuit is of current study, however no good demonstrations exist. To this end, a macro-scale model of a frequency division is investigated. Several models are proposed and a model continuing from Dr. Haddow's Ph.D. thesis was decided upon after considering finite element model simulations in UGS NX 6.0. The physical model was constructed and attached to a shaker to provide excitation. Preliminary results confirm Haddow's results for the first two modes, however additional modifications are necessary to create the proper frequency ratios. Further work will involve the addition of more beam elements to create a model closer to the proposed micro-scale frequency divider.

PHOSPHATIDYLCHOLINE SPECIFIC PHOSPHOLIPASE C DYSREGULATION OF GAP JUNCTIONAL INTERCELLULAR COMMUNICATION, A ROBUST CELLULAR RESPONSE TO ENVIRONMENTAL TOXICANTS, AND PREVENTION BY RESVERATROL
Esha Kumar
Location: Gold Room, 1:30 PM - 3:30 PM
Category: Cell Biology, Genetics, and Genomics-Section 3, Poster
Mentor(s): Pavel Babica (Pediatrics and Human Development), Brad Upham (Pediatrics and Human Development)
Inhibition of gap junctional intercellular communication (GJIC) has been associated with different pathologies including cancer, but molecular mechanisms regulating GJIC are not fully understood. Currently, two pathways have been implicated in the regulation of GJIC; one dependent on MEK1/2, and the second on phosphatidylcholine-specific phospholipase C (PC-PLC). We surveyed various toxicants as to whether they inhibit GJIC via MEK1/2 or PC-PLC or other signaling pathways, using a pluripotent rat liver epithelial cell line, WB-F344. Moreover, we studied the chemopreventative effects of the red wine antioxidant, resveratrol, on inhibition of GJIC induced by these toxicants. TPA, EGF and lindane regulated GJIC through a MEK-dependent mechanism, whereas eight different lower molecular weight PAHs, DDT, PCB 153, methoxychlor, vinclozolin, dicumylperoxide and perfluorodecanoic acid inhibited GJIC through PC-PLC. Both MEK1/2 and PC-PLC were involved in inhibition of GJIC induced by perfluorooctanoic acid, thrombin receptor activating peptide 6 and R59022. The effects of these inhibitors on GJIC (except perfluorodecanoic acid) were prevented by cell pretreatment with resveratrol. Inhibition of GJIC induced by benzoylperoxide, arachidonic acid, 18B-glycyrrhetinic acid, perfluorooctanesulfonic acid, 1-monolaurin, pentachlorophenol and alachlor was dependent neither on MEK1/2 nor PC-PLC and was not prevented by resveratrol (except alachlor). Our study demonstrates that the inhibition of GJIC induced by various chemicals is regulated by different, ligand-specific intracellular signal pathways, with PC-PLC being a major regulator for many environmentally relevant

contaminants. The preventive effects of resveratrol identified in this study could be one of the possible mechanisms contributing to its anti-cancer properties.

THE ROLE OF MULTIPLE DISCOURSES IN SCIENCE EDUCATION
Kirsten Kumpar
Location: Gold Room, 9:30 AM - 11:30 AM
Category: Education-Section 1, Poster
Mentor(s): Angela Calabrese Barton (Teacher Education)
This research focuses on the development of an empirically based case study looking at minority urban middle school students' learning and participation in an after-school, cyber-rich science and engineering program with content related to energy sustainability. The case study serves two purposes. First, it presents a set of findings which reveal the influence and effects of students' prior knowledge and awareness of multiple discourses on their learning and participation in educational environments. Second, the case acts as a "learning tool" for both pre-service teacher education students and new teachers, helping them learn about and develop a deeper understanding of how students' existing cultural knowledge, prior knowledge, experiences, and values affect their involvement in and learning of the content being studied. Specifically, the case presented in my poster examines a 12 year old 6th grader from an urban school district who is participating for the first time in this program. The case focuses on the relationship between her participation in the program and her interactions with political, economic, and environmental discourses, such as: rising gas prices, climate change, environmental issues with fossil fuels, green energy, green jobs, and the automotive industry bailouts of 2008. Students are exposed to and are able to access these discourses through a variety of places, including: social and academic environments, home lives, media, as well as current political issues. When completed this semester, the case will be piloted in Michigan State University's teacher preparation program in elementary science education.

ANALYSIS OF UNKNOWN GENE FUNCTION
Ben Labbe
Location: Gold Room, 9:30 AM - 11:30 AM
Category: Cell Biology, Genetics, and Genomics-Section 1, Poster
Mentor(s): Lee Kroos (Genetics)
The gene that codes for MrpA in Myxococcus xanthus is an important part of the pathway that leads to sporulation during starvation conditions. Very near to this gene on the genome is a gene that codes for spermidine synthase. The object of this series of experiments is to determine if the proximity of the two genes indicates that spermidine synthase plays a role in the sporulation pathway in addition to its usual functions.

COMPARATIVE ORGANIZATION OF GENES FOR OPEN READING FRAMES AND GENES FOR SRNA
Stephanie LaHaye
Location: Gold Room, 1:30 PM - 3:30 PM
Category: Cell Biology, Genetics, and Genomics-Section 3, Poster
Mentor(s): Julius Jackson (Microbiology and Molecular Genetics)
Its been found that 90% of bacterial chromosomal space is filled with potential operational open reading frames (O-ORFs) and potential "silent" non-coding reading frames (S-ORFs). Prior research analyzing the ORF density along the bacterial chromosome has shown that O-ORF density and S-ORF density anti-correlate. This project focused on the location of sRNA genes and how they correlate to the chromosomal positions of S-ORF and O-ORF genes in E. coli K12. It is hypothesized that the sRNAs will relate more to the O-ORFs, due to the regulation of these ORFs. We postulated that when plotted though a Pearson Product Moment Cross Correlation, the sRNAs would positively correlate to the O-ORF locations. Data previously collected were used to determine the location of the genes coding for sRNAs. The gene locations were plotted and entered into the formula to find the correlation to the gene locations of the S-ORFs and O-ORFs, but neither type of ORF showed a positive correlation to the gene locations of the sRNAs. Lag analysis was used, which involved the locations of the sRNA genes to be shifted to a point where an alignment was found that positively correlated the sRNAs to the O-ORFs and S-ORFs. These results indicate that gene location of sRNAs may play a role in regulating ORFs, different ways to analyze the data are still being investigated. This research can help better understand chromosomal space and determine if chromosomal location plays a major role in bacterial gene regulation.

DETERMINANTS OF MICHIGAN RESIDENTS' ATTITUDES ON LAKE WATER QUALITY AND GLOBAL WARMING
Brendan Lammers, Tim Nance
Location: Ballroom, 9:30 AM - 11:30 AM
Category: Environmental and Natural Resources-Section 1, Poster
Mentor(s): Frank Lupi (Agricultural, Food, And Resource Economics)
The objective of our research is to use the data we collected in these surveys to identify the determinants of Michigan residents' environmental attitudes, specifically regarding improved land management practices of farmers. By understanding what dictates peoples' environmental attitudes, lawmakers can make better informed decisions when creating policy. In July 2009, a survey on peoples' opinions on environmental improvements in Michigan was sent to a random sample of 6000 Michigan residents, with a final response rate of 41% after several reminders. The survey contained 55 questions focusing on global warming and lake water quality as it relates to changes in land management practices. There were both open-ended and closed-ended questions, and this research will focus on those that are closed-ended and use data analysis techniques to draw conclusions from this data. We will examine how factors such as income, gender, age, length of residence in Michigan, education, and other factors will impact peoples' environmental attitudes. Also, we will use economic theory to predict what these outcomes may be, and then test these predictions using SPSS software to analyze the data. For example, we expect that, based on the assumption that environmental improvements are considered luxury goods, that people with higher income are more likely to hold positive opinions about environmental improvements (i.e. more likely to agree with the statement "It's fair that I pay to get less greenhouse gas emissions).

EFFECTS OF LEPTIN AND INFLAMMATORY FACTORS ON THE PROLIFERATION AND DIFFERENTIATION OF HUMAN PROMYELOCYTIC CELLS
Jacqueline Lapp
Location: Parlor B, 10:15 AM
Category: Cell Biology, Genetics, and Genomics, Oral
Mentor(s): Pamela Fraker (Biochemistry and Molecular Biology)
Obesity increases the risks for diseases such as diabetes and cardiovascular disease. More recently, obesity has been associated with altered immune resources, an observation that is not fully understood. Obesity occurs with an increase in the number and size of adipocytes, originally thought just to store fat, now shown to release inflammatory cytokines. The release of inflammatory cytokines can cause an influx of immune system cells, such as neutrophils, macrophages, T and B cells, to the fatty tissue. Obesity can also cause increased levels of leptin, insulin, and other inflammatory factors that have an important role in immune system function. Increased numbers of immune cells in the blood of obese humans have been observed. Currently, we are using human promyelocytic cells, an immune cell precursor, to observe the role of leptin and other factors such as IL-6 on cell growth and differentiation using fluorescence-activated cell sorting. We are also observing the effects of serum from obese and lean individuals on the growth of promyelocytic and other cells.

THE INFLUENCE OF FOOD RATION ON THE STOCK SPECIFIC TRADEOFF BETWEEN EGG SIZE AND NUMBER: IMPLICATIONS FOR LARVAL SIZE
Dane Larsen
Location: Ballroom, 1:30 PM - 3:30 PM
Category: Agriculture and Animal Science, Poster
Mentor(s): Cheryl Murphy (Fisheries and Wildlife)
Body size has been shown to have various ecological implications. For fish larvae, larger body size at hatching may allow for better survival and faster growth through a vulnerable period in which the larvae may be confronted with gape-limited predators. However because bodily resources are limited within an individual mother, a tradeoff to larger offspring would mean that fewer offspring have the chance to survive to reproductive age. Thus the mother faces a challenge: should she produce smaller numbers of larger offspring, or larger numbers of smaller offspring, or some combination of small and large offspring? Furthermore, how does egg size relate to larval size? Are there any stock-specific patterns observed in the larval size variations? Does the amount of available food affect these patterns? We explored these questions with lake trout (Salvelinus namaycush), using 4 stocks of hatchery-reared females given high and low food rations. Eggs were collected at spawning and subset was fertilized and reared until yolk sac absorption at the Codrington Fishery Research Station. Larval lengths were measured using digital calipers, while egg diameters were measured using digital photographs. Generally, egg size highly correlated to larval size, however we found stock-specific trends and patterns related to food ration. Our results provide insight into how lake trout allocate available energy towards reproduction under changing environmental conditions and have implications for predicting how lake trout populations would respond to a change in the forage fish base.

BULL WORSHIP OR BULL? AN INVESTIGATION OF THE USE AND MEANING OF MINOAN DOUBLE AXES
Julia Lathin
Location: Lake Huron Room, 2:30 PM
Category: Humanities and Peforming Arts-Section 2, Oral
Mentor(s): Jon Frey (Art and Art History)
Since the time of the excavation of the palace complex of Knossos in the early 20th century by Arthur Evans, a number of so-called double axes as well as pictorial representations of seemingly similar objects have elicited many theories as to their use and meaning. Until recently these objects have been almost uniformly interpreted as double axe heads and have been thought to posses religious significance for the Minoan civilization. Through an examination of the chronology, typologies, media, and discovery locations of the pictorial renditions of these objects as well as through comparisons to other Minoan art forms, I suggest that many of these images do not represent axes at all. Rather, it is much more likely that they are stylized and decorative representations of the same types of natural features that often were the subject of other forms of Minoan art.

HAS CREATIVE DESTRUCTION CONTRIBUTED TO HIGHER PRODUCTIVITY AND GROWTH IN MICHIGAN?
Nicholas Laverty
Location: Ballroom, 1:30 PM - 3:30 PM
Category: History, Political Science, and Economics, Poster
Mentor(s): Jeff Biddle (Economics)
There is no questioning whether the state of Michigan has experienced a significant decline in its manufacturing prominence over the past 20 years. Reduced costs abroad gave firms incentive to outsource production away from Michigan, decreasing employment and ending an era of manufacturing dominance. Joseph Schumpeter championed the idea of 'creative destruction' describing the process when the downfall of one industry leads to an increase in overall social capital. As Michigan transitions toward a knowledge economy, it is extremely important to understand what role foreign competition played in the loss of Michigan's productive capacity, and if that loss helped stimulate increased future prosperity. Following the framework of a 2002 paper by Frederic Warzynski, 'Do Schumpeterian Waves of Creative Destruction Lead to Higher Productivity,' this study will explore whether Michigan has experienced positive results from manufacturing decline like those described by Schumpeter's theory. This paper will replicate Warzynski's econometric analysis using data for Michigan to discover what role creative destruction will play in Michigan's economic revival. Although analysis has been done for individual countries, no studies have been conducted for individual states. This paper adds to the debate over Michigan's economic future by looking at how international competition and the reallocative process can help an economy adapt to a changing circumstances, and shift productive resources away from declining industries to rising ones. (Warzynski, 2002)

ASSESSMENT OF MOTOR SKILLS IN MICE WITH A P264L MUTATION IN GAMMA-ACTIN
Lawrence Lee
Location: Parlor B, 10:00 AM
Category: Cell Biology, Genetics, and Genomics, Oral
Mentor(s): Meghan Drummond (Microbiology and Molecular Genetics), Karen Friderici (Microbiology and Molecular Genetics)
Actins are a family of highly conserved cytoskeletal proteins found in all eukaryotic cells and play an important role in cellular processes such as cell movement and muscle contractions. Gamma-actin (ACTG1) is one of six actin proteins found in cells throughout the body, but is predominant in auditory hair cells within the inner ear. Mutations in gamma-actin produce a dysfunctional protein that can lead to non-syndromic deafness, and has been identified as the cause of hearing loss in DFNA20 families that our lab has previously discovered. Considering this protein is expressed in all cell tissues, the purpose of this study is to examine whether a mutation in gamma-actin would affect other tissues besides the ear. To address this question, our lab has previously generated a knock-in mouse model for the P264L mutation. Mice with the P264L mutation show signs of hearing loss. A series of balance and muscle strength tests were conducted to investigate the possible effect of this gamma-actin mutation in muscle tissue and neuron function. The motor skills of the mice were assessed using a rotarod and a hanging wire exam to detect cerebellar defects, neuromotor deficits and evaluate motor strength. My results indicate that, similarly to the human family with the P264L mutation, the mice showed no signs of muscular dystrophy or neurological problems.

OPTIONAL PLURAL MARKERS IN ARTIFICIAL LANGUAGE LEARNING
Braden Leinbach, Chris Heffner, Scott Osdras
Location: Ballroom, 1:30 PM - 3:30 PM
Category: Psychology-Section 3, Poster
Mentor(s): Alan Munn (Linguistics), Cristina Schmitt (Linguistics)
In English, when speaking of multiple objects, we use the plural form of the noun. However, not every use of a plural marker denotes 'more than one'. For instance, in the sentence, 'Dogs have tails', the word 'tails' is plural, but it does not indicate that each dog has multiple tails. From this and other examples, linguists have formed the hypothesis that the plural does not inherently mean 'more than one', but instead gets this meaning by implicature based on the speaker's decision not to use the singular. This experiment examines native English speakers' learning of a constructed language in which it is not compulsory to mark the plural. We created an artificial language with 30 nouns, 3 verbs, 4 adjectives, a negative marker, a preposition, the number one, and a plural marker. Subjects learned (without overt instruction) the language over five half-hour sessions, culminating in a final test which demonstrated their understandings of the properties of the optional plural marker. By varying the input probabilities of the plural vs. singular learning input we tested the participants' abilities to infer the semantics of the plural in the constructed language. We hypothesize that the learners' usage of the optional plural will be affected by their input experience and will not match that of English's. The results will help us better understand the properties of plural markers in all languages.

PIZZA CERTIFICATION
Anna Levine, Daniel Buhlinger, Katie Buhlinger
Location: Ballroom, 9:30 AM - 11:30 AM
Category: Environmental and Natural Resources-Section 1, Poster
Mentor(s): Steven Safferman (Biosystems Engineering)
We will be analyzing different pizza stores' current sustainable procedures in order to create a certification that will make an impact in the “green movement." In addition, it is important that the criteria are not too difficult for the businesses to fulfill. Through research of previous certifications, speaking with businesses, and surveying students, along with advice from professionals here at Michigan State University, we will design a certification and market it to pizza parlors. The team hopes to publish an article in the local newspaper to promote public awareness of the certification and increase the advertising for the companies that partake.

EFFICIENCY OF STATE HIGH RISK HEALTH INSURANCE POOLS
Jeffrey Levy, Matt Barkell
Location: Tower Room, 11:30 AM
Category: History, Political Science, and Economics, Oral
Mentor(s): Jeff Biddle (Economics)
We will be exploring the efficiency of state programs designed to fund health insurance for the high-risk segment of the population that is not fully disabled, and thus ineligible for Medicaid. Those who fall in this area are frequently uninsured, as they are unable to purchase insurance on the private market due to underwriting guidelines. We will be performing regression analysis on panel data across states and over time, paying particular attention to the effects on emergency room visits, the size of the uninsured population, and policy rates in the private health insurance market. There is an abundance of variation in the cross-section and time-series data: 35 states have a high-risk program, some implemented as early as the 1970s, some as late as the early 2000s, and many in between. This analysis is relevant to important areas in the current health care debate, particularly relating to issues of government-funded health care.

EXCAVATING THE FOUNDATIONS OF MSU: CAMPUS ARCHAEOLOGY AND COLLEGE HALL
David Lewandowski
Location: Gold Room, 1:30 PM - 3:30 PM
Category: Social Science: General-Section 2, Poster
Mentor(s): Lynne Goldstein (Anthropology)
When people think about archaeology, images of Indiana Jones and ancient civilizations most often come to mind. Most people would never consider the potential history that lies beneath their feet. Most students and faculty are unaware of the history that lies beneath the university’s buildings and sidewalks. The Campus Archaeology Program (CAP) here at Michigan State looks to bring our history to light through archaeological investigations around campus. During the fall of 2009, CAP conducted excavations and testing at the site of College Hall, the first building constructed on the MSU campus in 1856. My poster will present the methods in which CAP investigated the College Hall site and the

conclusions that were drawn from these investigations. The poster will also address the goals of CAP, which include preserving the history and archaeological sites of MSU and the ways in which we engage and involve the public within our research.

EFFECTS OF PACKAGE DESIGN AND MATERIAL ON ANTHOCYANIN CONTENT OF BLACKBERRIES
Nathan Lewandowski
Location: Ballroom, 9:30 AM - 11:30 AM
Category: Health, Food, and Wellness, Poster
Mentor(s): Eva Almenar (Packaging)
Consumption of antioxidants is thought to help treat brain injuries and reduce the risk of developing cancer and heart disease. Anthocyanins, a class of pigments with antioxidant properties, are known to be found prominently in blackberries. This study is meant to provide insight on how packaging can affect the antioxidant content of berries for the duration of shelf life. Blackberries of two unique types (Canaska and Chester, both Michigan-grown) were stored in a variety of packages under controlled conditions. These packages differed in design (open/closed) and material (petroleum-based/bio-based). Periodically, samples were taken from each package, pureed, and frozen. These samples will be thawed, treated with ethanol acidified with hydrochloric acid and sodium citrate buffer, centrifuged, and subjected to spectroscopic analysis. At the appropriate wavelength, the amount of light absorbed corresponds to the anthocyanin content of the sample. A preliminary test with store-bought blackberries yielded an absorbance value of 1.880. The results of this study have the potential to be relevant along the entire supply chain, from choosing the most potent berry variety to ship out of the farms to the most accommodating package to place on the store shelves.

A COMPARATIVE STUDY: THE EFFECT OF SADDLE TYPE ON VOLUNTEER EXERTION DURING THERAPEUTIC HORSEBACK RIDING
Elisabeth Lewis
Location: Parlor A, 10:30 AM
Category: Agriculture and Animal Science, Oral
Mentor(s): Camie Heleski (Animal Science)
My research addresses the effect of a new saddle type, the Independent Saddle (IS), on volunteer exertion during therapeutic horseback riding (THR). To do this, the IS must be compared with the two other saddle types regularly used for THR. Due to postural challenges, especially with riders who have cerebral palsy, THR is labor intensive. There can be up to 4 volunteers for a single rider. For riders with especially severe grades of cerebral palsy, the exertion demands upon these volunteers can be significant. I am interested in whether the IS causes a significant change in volunteer stress/exertion in comparison to regularly used saddles. Therefore, my research focuses on comparing stress/exertion levels between saddle types. This is accomplished through an exertion scale developed for this study, ranging from 0-3, where 0 means no effort was required and 3 means constant and/or heavy effort was required. Data from 30 minute lessons were collected from 6 dates over a 6 month time period, in which 1 minute of data per 5 minutes of lesson was analyzed, from up to 10 riders and 8 horses per saddle type. Approximately 30 lessons were analyzed per saddle type. The effect of saddle on total assistance score was significant ($p = 0.0025$). There is not enough data to determine if IS requires less assistance than BR, but data shows that IS and BR require significantly less assistance than HS. In my presentation, I intend to further analyze the results of my data collection and analysis.

EVALUATION OF THE EFFECT OF SALINITY ON THE GERMINATION AND GROWTH OF SUGARBEET
Raymond Lindsey
Location: Ballroom, 1:30 PM - 3:30 PM
Category: Agriculture and Animal Science, Poster
Mentor(s): J Mitchell McGrath (Crop and Soil Sciences)
Soil salinity impacts agricultural productivity worldwide, and plant tolerance to salinity is an important breeding goal. Excess salinity prevents germination, retards plant growth and diminishes yield. Adult sugarbeet are among the more salt-tolerant crops, but are salt-susceptible during germination. The goal of this research is to examine the effects of salinity on germination and seedling growth of sugarbeet. Germination of sugarbeet seeds in saline solutions in the laboratory identified germplasm with greater tolerance to saline germination in comparison to other germplasm. Results demonstrated two different responses to germination among tolerant germplasm in saline conditions, one response where a fraction of the total germplasm germinated relative to control (no salt) conditions, and another where all seeds germinated but at a slower rate in saline treatments. Germinated seedlings from all treatments were further evaluated to assess tolerance to saline irrigation in the greenhouse. Initial results of irrigation treatments showed seedlings germinated in the saline treatments were more tolerant to saline irrigation than the control germinated seedlings. The degree to which salt tolerant germination predicts growth and development under stress suggests that germination in salt solutions can be used as a screening and selection tool for breeding sugarbeet for higher performance in adverse environments.

BUILDING A DOCUMENTARY EDUCATION ETHOS
Jessica Lipowski
Location: Lake Superior Room, 2:30 PM
Category: Communication Arts and Sciences, Oral
Mentor(s): Geri Alumit-Zeldes (Journalism)
The College of Communication Arts & Sciences is capitalizing on a unique moment in which national, regional and local forces are creating conditions necessary to build a documentary curriculum. These forces - some accidental, others manufactured by economic malaise, and yet others are a byproduct of decades of work - appear as a constellation. The purpose is to document the forces at play that may provide a map for other universities, colleges or schools looking to create a documentary education ethos. Over the last decade, MSU witnessed a significant increase in the number of students interested in documentary and film studies. Students who enter these programs desire to impact society viz a vis documentaries such as An Inconvenient Truth, The March of the Penguins and Bowling for Columbine. These Academy Award winning documentaries tell compelling stories based on real life ideas, issues and people, and enlighten in ways that fiction film does not. The glamour born out of strong documentaries allures students and professionals. In response to demand, TISM and English's Film Studies created a specialization in Documentary Studies that prepares students to be a part of that traditional and artistic outlet. Its focus is on the history, theory

and production of Documentary forms and modes of expression. This includes any medium which students and faculty alike can examine the wonder and complexity of the world through documentary. Graduates will be prepared for success, whether it is in journalism, public or cable television, or independent or feature films.

THE EVOLUTION OF SAXOPHONE QUARTET MUSIC
Nicolas Lira, Hannah Adams, Christopher Klerkx, Mary Sopelak
Location: Parlor C, 2:30 PM
Category: Humanities and Peforming Arts, Performance Demonstration
Mentor(s): Joseph Lulloff (Music)
The small body of music written for saxophone in its first 50 years of existence was in the style of string and vocal music. The saxophone quartet composed by Karyl Florio, from 1879, shares many characteristics with the string quartets of Brahms and Schumann. Florio does not take full advantage of the saxophone's potential. The saxophone quartet became more prevalent in the 20th century. In the United States, John Phillip Sousa often featured a saxophone quartet and in Europe the Marcel Mule Quartet emerged. The Mule quartet premiered a large number of idiomatic works for saxophone quartet beginning in the 1930s. Since that time the number of compositions for saxophone quartet has grown substantially and composers now take advantage of the ensemble's flexibility. Contemporary quartet music uses extreme dynamics, specific articulations, alterations of the sound and the saxophone's versatility in multiple genres such as rock and jazz.

SENSITIVITY ANALYSES OF A MATHEMATICAL MODEL DESCRIBING GENETIC EXPRESSION
Xiaozhou Liu
Location: Gold Room, 9:30 AM - 11:30 AM
Category: Engineering, Computer Sci, and Math- Section 1, Poster
Mentor(s): David Arnosti (Biochemistry)
Transcriptional regulation in a biology system has been studied extensively with many mathematical modeling efforts. In my study, I examine the mathematical model employed in Arnosti lab in terms of its sensitivity to each parameters in a local manner. Such a study allows a closer look at model constructions and provide suggestions to model improvements and potential improbabilities.

TEMPORAL AND SPATIAL VARIATION IN ISOTOPE VALUES OF HAWAIIAN PETREL BONE COLLAGEN
Catherine Lorenz
Location: Ballroom, 1:30 PM - 3:30 PM
Category: Environmental and Natural Resources-Section 2, Poster
Mentor(s): Peggy Ostrom (Zoology)
Once of great abundance on the Hawaiian Islands, the Hawaiian Petrel has seen a drastic population decline since the arrival of humans and is now listed as an endangered species. In an effort to inform conservation managers about this species, studies on foraging ecology are being conducted using isotope analysis. Carbon and nitrogen isotope values of bone collagen can provide insight to both feeding location and trophic level, respectively. In contrast to stomach content analysis, isotope values of bone collagen allow for a diet comparison over years rather days. Additionally, bone collagen can be isolated from ancient as well as modern specimens. In this study, temporal and spatial differences in isotope values of Hawaiian Petrel bone collagen were examined using ancient and modern bones from different Hawaiian Islands. Carbon and nitrogen isotope values of bone collagen from ancient petrels dating from 100-500 years ago differ significantly from modern bone collagen in both carbon and nitrogen isotope values (unpaired t-test, $p < 0.01$). Furthermore, nitrogen isotope values of Hawaiian Petrels from the island of Hawaii are significantly different from those of Kauai (unpaired t-test, $p < 0.01$), while carbon isotope values from the same birds showed no significant difference. These data indicate that the niche of Hawaiian Petrels has changed over time, possibly due to competition with humans for marine resources. There are also signs of niche segregation between breeding colonies despite the close proximity of Hawaiian Petrels on neighboring islands.

ASIAN STEREOTYPES IN THE MASS MEDIA
Mengyu Lu
Location: Lake Superior Room, 2:00 PM
Category: Communication Arts and Sciences, Oral
Mentor(s): John Sherry (Communication)
The research focuses on the impact of media exposure to the perceptions of Asian minorities in the U.S. including their perceptions on behaviors, occupations, traits of Asian Americans. Through comparing the cultural perceptions and their media exposure, as well as the objective data based on the social reality, I examine how ideas towards a particular racial group are cultivated by the mass media. The impact of media to the research participants is measured by the subjects' exposure to 25 popular Hollywood movies, in which 9 movies depict Asian characters. The major research strategy is a quantitative survey conducted to college students at Michigan State University. The study also uses data collected from archives, newspapers, and published reports, as well as previous content analysis studies based on similar topics. The research pursues to find out the popularity of Asian stereotypes in the U.S. and how it is related to the viewing of the American movies. The study is guided by the cultivation theory. By presenting characters of different traits on the big screen, the movie as an important form of mass media, constantly contribute to our learning process of cultural groups around us.

PROBING ENZYME-SUBSTRATE INTERACTION OF AN INTRAMEMBRANE-CLEAVING PROTEASE
Paul Luethy
Location: Parlor B, 12:00 PM
Category: Cell Biology, Genetics, and Genomics, Oral
Mentor(s): Lee Kroos (Biochemistry and Molecular Biology)
SpoIVFB mediates regulated intramembrane proteolysis in the soil bacterium *Bacillus subtilis*. When starved, this bacterium undergoes spore development directed by several transcription factors. Pro-σ^K is one of these factors, and requires that SpoIVFB cleave it to σ^K before gene expression can begin. SpoIVFB is a model protein for the intramembrane-cleaving proteases, whose active sites are buried within membranes, where they cleave transmembrane segments of their substrates. Studying the interaction between SpoIVFB and Pro-σ^K will reveal how this unusual type of protease functions. Through site-directed mutagenesis, an active, cysteine-less version of the protein was created by mutating either one or three of SpoIVFB's five cysteine residues to leucine, while the others were changed to serine. Through further mutagenesis, a single cysteine was placed in SpoIVFB at residues believed to be close to Pro-σ^K during cleavage. A single cysteine was also placed into several residues in Pro-σ^K, which can allow us to study enzyme/substrate interactions through cross-linking experiments.

RELATIONSHIP BETWEEN HIV, AIDS, MYELIN BASIC PROTEIN, TCR SEQUENCES AND ASSOCIATED PATHOGENS
Karen Luplow
Location: Ballroom, 9:30 AM - 11:30 AM
Category: Microbiology, Immunology, and Infectious Disease-Section 2, Poster
Mentor(s): Robert Root-Bernstein (Physiology)
Researchers at Temple University School of Medicine found oligoclonal T cells infiltrating the brains of children with AIDS. We used the T cell receptor (TCR) B sequences from pediatric AIDS patients to search for homologies. The patients had AIDS and autoimmunity against myelin basic protein. Similarity searches revealed that TCR sequences of AIDS patients mimic human infectious agents associated with AIDS. Using synthesized TCR peptide regions and reagents through the NIH AIDS Research and Reference Reagent program, we performed ELISA tests to compare the binding of TCR sequences and myelin basic protein with antibodies that correlated with the infectious diseases found in the homology searches. Such complementary regions between TCR and AIDS-associated pathogens could suggest a mechanism in the progression of AIDS and a source of confusion for the immune system.

EXPRESSION OF ALTERNATE WRI1 TRANSCRIPTS DURING PLANT DEVELOPMENT
Jon Mackey
Location: Gold Room, 9:30 AM - 11:30 AM
Category: Biochemistry and Molecular Biology-Section 1, Poster
Mentor(s): Christoph Benning (Biochemistry and Molecular Biology)
One of the first novel examples of alternative splicing in plants was found in spinach and Arabidopsis when observing the rubisco activase. A second example found in glutathione S-transferase of maize also provided insight to what roles alternative splicing might play in the plant. Based off of previous published work, most alternative splicing has played a part in the development of seeds and flowering. Much less is known about the alternative splicing in plants than in animals based on the availability of established sequence tags(EST). However, the completion of Arabidopsis and rice genome sequences and the availability of cDNA sequences(EST) has enabled genome-wide examination of alternative splicing in these plants. The WRI1 gene has been demonstrated to play a role in the filling of seed oil during seed development in Arabidopsis thaliana. The WRI1 protein has been labeled an AP2 transcription factor which promotes the production of Fatty Acid synthesis precursors. It is also regulated by another transcription factor called Lec2, and is somehow also regulated by the presence/absence of sucrose though the exact mechanism is not known. With multiple papers published on WRI1 and the discovery of alternative transcripts in plants becoming more prominent due to increased availability of cDNA codes, an investigation of WRI1's multiple ESTs is logical. With the previous knowledge of when, where, and how WRI1 is expressed, an experiment was devised to test for the presence of the multiple transcripts to begin to explore what role(s) each may play in Arabidopsis.

RETHINKING GENDER THROUGH THE SILK ROAD MUSIC
Madeline Mackinder
Location: Lake Huron Room, 11:00 AM
Category: Humanities and Peforming Arts-Section 1, Oral
Mentor(s): Catherine Ryu (Linguistics)
This project focuses on the relationship between the Silk Road and the gendering of Silk Road music. The music that will be studied will come from videos, recorded performances, and written documents about the music. By sampling examples of current traditional Silk Road music from three regions, China, India, and Egypt, this study aims to illuminate the relationship between musical performance, how performers are displayed onstage, what kind of music they play, and what kind of instruments tend to be played by each sex, and how it relates to gender. The study will include focuses on some particular performances from Yo-Yo Ma's Silk Road Ensemble, a traditional song piece sung by the famous Indian singer Asha Bhosle, and Umm Kulthum, Egypt's greatest singer. In particular, this study aims to look at the differences in performance in public by females, and the consequences that come from the performance. The respectability of women performers is sometimes jeopardized in certain cultures and the role they must perform while playing music differs. I will research how being male or female can affect how the Silk Road is portrayed through its music.

THE SOIL BACTERIA PLATING PHENOMENA
Adetayo Mafe
Location: Ballroom, 1:30 PM - 3:30 PM
Category: Microbiology, Immunology, and Infectious Disease-Section 4, Poster
Mentor(s): Thomas Schmidt (Microbiology and Molecular Genetics), Clive Waldron (Microbiology and Molecular Genetics)
When a suspension of bacterial cells is diluted, the number of colony forming units (cfus) is expected to decrease directly proportionate to the dilution. In spite of that, previous students in this research class had found when they diluted a suspension of soil bacteria the number cfus decreased significantly less than expected. We tested winter soil by performing successive dilutions to see if the previous results are a property of just summer soil or of soil in general. We had observed a decrease in colony formation that was not proportional to the dilution. As a control, we did consecutive dilutions of a pure Escherichia coli culture to see if the protocol and the media being used was a factor in the results from the soil experiment. With the E. coli we found a proportional decrease in cfus to the dilutions. We want to determine why the soil sample has such a disproportionate decrease in cfus. In order to solve this problem it is necessary to look further into the bacterial interactions that are happening on the plates and the plating environment at the various dilutions. We have decided to isolate and identify colonies from the least diluted and the most diluted plates. This research may add understanding to the ecology of soil bacteria.

AVIAN FILARIOID NEMATODES AND THE POTENTIAL FOR ENHANCEMENT OF WEST NILE VIRUS
Alvin Makohon-Moore
Location: Parlor B, 11:45 AM
Category: Cell Biology, Genetics, and Genomics, Oral
Mentor(s): Edward Walker (Microbiology and Molecular Genetics)
West Nile virus (WNV) is a vector-borne disease system shared by wildlife, domestic animals, and humans. WNV is maintained in a bird-mosquito cycle with occasional spill-over into mammals, such as humans. The ecological factors driving the transmission and amplification of WNV in urban environments are of particular importance for human and wildlife health. This undergraduate research project will study the effect of co-infection in a bird or mosquito with WNV and microfilarial nematodes. It has been hypothesized that the microfilarial stage of parasitic nematodes enhances arbovirus transmission, such as WNV. This occurs by the microfilarial parasites entering the mosquito's midgut and penetrating a hole, which allows faster dissemination of WNV into the mosquito. Specifically, previously collected bird blood and mosquitoes from Chicago, IL will be utilized for the PCR-based detection of microfilarial DNA. Given that microfilarial parasites circulate in the blood of birds at night and remain dormant in organ tissue during the day, it is hypothesized that bird blood collected at night will have a higher prevalence of microfilariae than bird blood collected during the day. It is also expected that WNV positive mosquitoes will have higher prevalence of microfilariae than WNV negative mosquitoes. This research project explores an under-studied relationship which could have dramatic implications on what we know, or think we know, about the ecology of WNV transmission in urban systems.

BRAIN FMRI DURING CHANGES IN FLUID BALANCE
Chae Mamayek, Danielle Jamrog, Phillip Lukulay, Patricia Okrasinski, Dominique Sanchez, David Westphal
Location: Parlor C, 12:15 PM
Category: Psychology, Oral
Mentor(s): Joseph Carlson (Radiology), Ronald Meyer (Physiology), Jill Slade (Radiology), Robert Wiseman (Physiology)
Homeostatic control of fluid balance in the body requires the integration of several physiologic signals. For example under conditions of mild dehydration perceptions of thirst are sensed by dryness of the mouth and a desire to drink fluids driven by central control in the brain. In addition, chemical signals within the plasma are integrated in the brain to induce fluid intake. Therefore hydration state depends on both the perception of thirst and the physiologic drive to maintain hydration, which are located in different regions of the brain. To investigate brain (de)activation during these fluid balance changes we utilized functional magnetic resonance imaging of the brain in healthy human subjects. Subjects self-restricted fluid intake (6 hours) prior to the experiment. Fluid balance was assessed using urine osmolarity both before and after intake of a fixed volume of the test solutions. Functional brain images were acquired continuously prior to, during and following consumption of water or a commercially available sports drink. We tested the hypothesis that the time course of brain (de)activation would be different in the regions of the brain that perceive thirst compared to regions that drive the physiologic response. In addition we tested the hypothesis that the time course of brain (de)activation would be different when comparing tap water to a commercially available sports drink.

MOMENTARY PERCEPTS
Irida Mance
Location: Ballroom, 9:30 AM - 11:30 AM
Category: Psychology-Section 2, Poster
Mentor(s): Mark Becker (Psychology), Taosheng Liu (Psychology)
Many theories have dealt with the limited attentional abilities of our visual perceptual system. Some suppose attention selects specific spatial areas for preferential processing, while others propose attention can select a limited number of objects for supplemental thorough encoding. However, in such propositions, the extent of how many features such as color, orientation, spatial frequency etc., we can attend to at any one moment has received relatively little attention. The current study aims to examine one such postulation, the Boolean-feature-map theory, put forward by Huang and Pashler (Huang & Pashler, 2007; Huang, Treisman, & Pashler, 2007). The authors propose individuals are limited to accessing one feature, contained in a Boolean-feature-map, at any one moment; meaning if that if we wanted to perceive two features, such as both blue and red we would be unable to. The proposed experiments investigate whether the same principles will hold when methodological flaws are accounted for, and to examine if such principles generalize to other features beyond color.

RESULTS OF INTERVENTIONS AND IMPLICATIONS OF POLICIES AND THEIR IMPLEMENTATION IN SCHOOLS
Ellen Mang, Tiffany Critz, Caitlin Fisher, Natalie Knoll
Location: Parlor A, 1:15 PM
Category: Health, Food, and Wellness, Oral
Mentor(s): Katherine Alaimo (Food Science and Human Nutrition)
Nutrition plays an important role in the healthy development of children. Schools have the opportunity to make an impact on the diets of their students. The School Nutrition Advances Kids (SNAK) project examines the food and nutrition environment in a sample of 62 low-income middle schools throughout Michigan, as well as evaluates several interventions designed to improve eating behaviors. The SNAK interventions include one that involves completing the Healthy School Action Tools (HSAT) and implementing positive policy and environmental changes. Another intervention is for a group of schools to complete the HSAT as well as implement the Michigan State Board of Education Policy on Healthy Foods and Beverages in Venues Outside of the Federally Regulated Child Nutrition Programs. One aspect of SNAK is to examine the nutrient composition of the foods and beverages offered in a la carte as well as what the students are choosing to purchase. Baseline and post intervention a la carte data for each school have been analyzed to assess changes made during SNAK. Along with nutrient analysis, we have assessed the local district wellness policies for strength and quality of the statements. We have compared the strength of the policies with the implementation. The wellness policy and a la carte results will provide a better understanding of overall nutrition in low income Michigan middle schools, aid in determining the success of the interventions, and the effectiveness of the local district wellness policies.

FATTY ACID DESATURASE 4 OF ARABIDOPSIS ENCODES A PROTEIN DISTINCT FROM CHARACTERIZED FATTY ACID DESATURASES
Arthur Manoli III
Location: Gold Room, 9:30 AM - 11:30 AM
Category: Biochemistry and Molecular Biology-Section 1, Poster
Mentor(s): Christoph Benning (Biochemistry)
Polar membrane glycerolipids occur in a mixture of molecular species defined by a polar head group and characteristic acyl groups esterified to a glycerol backbone. A molecular species of phosphatidylglycerol specific to chloroplasts of plants carries a D3-trans hexadecenoic acid in the sn-2 position of its core glyceryl moiety. The fad4-1 mutant of Arabidopsis thaliana missing this particular phosphatidylglycerol molecular species lacks the necessary fatty acid desaturase, or a component thereof. The overwhelming majority of acyl groups associated with membrane lipids in plants contains double bonds with a cis configuration. However, FAD4 is unusual because it is involved in the formation of a trans double bond introduced close to the carboxyl group of palmitic acid, which is specifically esterified to the sn-2 glyceryl carbon of phosphatidylglycerol. As a first step towards the analysis of this unusual desaturase reaction, the FAD4 gene was identified by mapping of the FAD4 locus and coexpression analysis with known lipid genes. FAD4 encodes a predicted integral membrane protein that appears to be unrelated to classic membrane bound fatty acid desaturases based on overall sequence conservation. However, the FAD4 protein contains two histidine motifs resembling those of metalloproteins such as fatty acid desaturases. FAD4 is targeted to the plastid. Overexpression of the cDNA in transgenic Arabidopsis led to increased accumulation of the D3-trans hexadecanoyl group in phosphatidylglycerol relative to wild type. Taken together these results are consistent with the hypothesis that FAD4 is the founding member of a novel class of fatty acid desaturases.

LATE CASTRATION INCREASES OBSERVED SCROTAL HERNIAS AND REDUCES THE NUMBER OF IRREPARABLE SCROTAL HERNIAS
Katherine Marcath
Location: Parlor A, 10:45 AM
Category: Agriculture and Animal Science, Oral
Mentor(s): Gretchen Hill (Animal Science)
A common problem in commercial swine facilities are scrotal hernias often observed around the time of castration. Pigs develop scrotal hernias with prevalence between 0.5 to 2%. Increasing the number of observed and repaired hernias could result in less mortality prior to weaning. This study was conducted to determine whether time of castration would impact number of irreparable ruptures and incision healing at weaning. Intact male pigs (n=3080) from 602 crossbred litters were sired by mixed semen from 327 line PIC boars. Since breed differences exist in regard to prevalence of scrotal hernias, maternal genetics were randomly selected throughout nine rooms within one farrow-wean unit. Intact males were castrated at 4 to 6 (E) or 8 to 10 (L) d of age. All males within each litter were castrated at the same age. When picked up for castration, pigs were observed for a rupture that was defined as protrusion of intestine in the scrotal area. If a rupture was found prior to castration, it was surgically corrected. However, if the rupture was found during or after castration, the rupture was corrected manually with tape. At weaning, a subsample of barrows were inspected for completely healed or not healed, healed defined as minor to no scabbing and no signs of infection. Late castration increased the number of noticed ruptures (.6333%, $p < .05$) compared to early castration (.1999%). Ruptures noticed after castration were not significant.

HOW PRESCHOOL CHILDREN CHOOSE BETWEEN SOURCES OF INFORMATION
Ashley Marderosian
Location: Ballroom, 9:30 AM - 11:30 AM
Category: Psychology-Section 2, Poster
Mentor(s): Judith Danovitch (Psychology)
An abundance of research has been conducted to analyze why children ask questions, and what types of things they generally inquire about. Nevertheless, little is known about children's actual process of searching for information. The aim of our study is to discover where children prefer to look for answers, and specifically whether they prefer to consult human or non-human sources. We hypothesize that younger children will be more inclined to seek out answers from a human, whereas older children will show a growing preference for non-human options, such as a computer. To investigate this question, we are presenting 3 to 5 year old children with a series of questions that a character wants to answer. Each of these questions represents one of three domains: biology, physics, or psychology. The child is then asked to choose, using four pictures of sources, where they think the character should go to find the answer. Two of these sources are human (the character's mother and teacher), and two are non-human (books and a computer). Data analyses will demonstrate if children of different ages prefer to use human or

non-human sources, and if the nature of the question has any relationship to the sources they choose. This information will broaden our knowledge of how children seek out information, and will potentially help educators adopt more efficient teaching methods in the classroom.

THE GREENING OF FLINT
Kristina Marks, Anthony Siciliano
Location: Green Room, 9:45 AM
Category: Digital Media-Section 1, Oral
Mentor(s): Troy Hale (Journalism), Geri Alumit- Zeldes (Journalism)
How can the city of Flint improve itself? Or can it not? "The Greening of Flint" is a documentary that shows the story of a troubled city through the people who are trying to make it a better place. Vacant lots clutter neighborhoods, garbage fills the streets and people have become forgotten amongst these problems. Master King, Mama E and others tell their stories and the way they feel Flint can be turned around.

RING
Colin Marshall
Location: Green Room, 11:00 AM
Category: Digital Media-Section 1, Oral
Mentor(s): Melissa Fore (Writing)
RING is a LGBT caucus that serves North Complex (Mason/Abbott & Snyder/Phillips). The video presentation I have provided gives an inside look at the group, including footage of events as well as interviews from the general assembly and members of the executive board.

LABELING PHOTORHABDUS WITH MCHERRY
Alexander Martin
Location: Parlor B, 11:30 AM
Category: Cell Biology, Genetics, and Genomics, Oral
Mentor(s): Todd Ciche (Molecular Biology)
The development and exploitation of fluorescent proteins is arguably one of the most important tools that scientists utilize today. We currently utilizes GFP and dsRED as fluorescent markers to visualize bacteria Photorhabdus during nematode Heterhabditus bacteriophora life cycle. The lab desires a red-labeled Photorhabdus as bright and photostable as GFP. The particular protein of interest in this cloning is the relatively new mCherry fluorescent protein. This protein is desirable because of its short folding time, high photostability and brightness. mCherry, a second generation monomer of dsRED, will be cloned into Photorhabdus luminescenes and Photorhabdus temperata. This fluorescent protein will be cloned into a Tn7 transposon vector pUC18R6KT fused with the selectable marker Gentamicin resistance gene flanked with FRT sites. After a triparental mating, the Tn7 with mCherry and Gentamicin will be incorporated into the host's genome. Gentamicin will later be removed using flipase which will target the FRT sites. This will result in a brighter, more photostable red labeled Photorhabdus.

SUSTAINABLE URBAN GOAT FARM
Julio Martinez, Andrew Sommerlot, Michael Wandersee
Location: Parlor A, 12:00 PM
Category: Agriculture and Animal Science, Oral
Mentor(s): Dana Kirk (Biosystems Engineering), Steven Safferman (Biosystems Engineering)
With the increase of unused urban land, urban agriculture has become a business opportunity within many cities. The potential benefits are city beautification, employment, and education. Because of the proximity of population to the farming establishment, exports become cheaper due to reduced shipping expenses in turn creating cheaper products, and there is a market possibility because of low availability of fresh food products within the city. Detroit is being targeted because of the plummeting population creates open land. Organic goat farming creates unique opportunities for production of milk, cheese, and meat, but produces problems such as managing waste, creating a sustainable cash flow, and ethical treatment of the animals. The objectives of the project are as follows: Create conceptual designs for land use of an urban goat farm. Create a computer model that chooses the design that best optimizes energy inputs with milk, meat, and cheese outputs, waste management, availability of land, ethical treatment of the animals, employment, and educational opportunities based on constraints.Design preliminary plans for a waste management system. The constraints of the project are as follows: A minimum of 40 goats to optimize production of meat, cheese, and milk. Useable land consists of pasture and building based. Create an educational facility with integration with the goat operation. Ability to consider the farm organic.

VIDEO-BASED RESPONSE & REVISION
Jaymee Mason
Location: Tower Room, 1:30 PM
Category: Education, Oral
Mentor(s): Samantha Caughlan (Teacher Education), Mary Juzwik (Teacher Education)
The Video-Based Response and Revision (VBRR) project studies Michigan State University teacher candidates as they video record themselves teaching in their classrooms, share these videos with an online group of other teacher candidates, respond to one another's clips, and then make revisions to their teaching based on these responses. The video clips are examples of the teacher candidates engaging their students in dialogic instruction, a cluster of teaching practices which engage students in multi-vocal discourse where students voice their ideas and questions. Since these student-centered teaching practices are uncommon in the current United States English curriculum, the teacher candidates introduce dialogic instruction to teachers who are often unfamiliar with the term and the practices themselves. Specifically I ask: How are the teacher candidates and the mentor teachers fostering attitudes toward dialogic instruction in an environment where the teacher candidates are often times teaching the mentor teachers? As a part of the research, a group of focal teacher candidates were interviewed at the end of their internship year and asked questions about their internship year and the VBRR project itself. This undergraduate research focuses on these exit interviews and what the 2008-2009 teacher candidates expressed as the attitudes of their mentor teachers and of

themselves toward dialogic instruction. It more particularly stresses the mentor/candidate relationships born from these varying or similar attitudes and their resulting perspectives on dialogic instruction due to these relationships.

DOING GENDER: MEDIA REPRESENTATIONS OF THE 2010 WINTER OLYMPIC ATHLETES
Maddi Massa
Location: Ballroom, 9:30 AM - 11:30 AM
Category: Communication Arts and Sciences, Poster
Mentor(s): Kelly Morrison (Communication)
West and Zimmerman have suggested that one of the ways societies "do gender" is to create unnecessary differences between girls and boys, or women and men. They further suggest that institutional structures, such as organized sports, offer resources and constitute ideals for doing gender. One of the ways which we can examine their concept of doing gender is to explore the media representations of female and male athletes. This research presents an analysis of recent media representations of female and male athletes of the 2010 Vancouver Winter Olympic Games. Specifically, this project examines the NBC network television coverage, the print coverage in Sports Illustrated Magazine and the online coverage by the sites womentalksports.com and espn.com. Wood's themes of femininity and masculinity and Doyle's dimensions of femininity and masculinity are used as organizing thematic frameworks. The current portrayals and perpetuation of gender roles are examined and discussed.

PLANETARY MANAGEMENT: EARTH
Curtis Matzke
Location: Green Room, 10:15 AM
Category: Digital Media-Section 1, Oral
Mentor(s): Amol Pavangadkar (Telecommunication, Information Studies and Media)
This is a short fiction film centered on environmental sustainability and population control on earth as observed from extraterrestrials. The film presents itself as a public service announcement that rationalizes and explains the annihilation of the human race. The film includes interviews with the aliens (who appear human), as well as found footage and still images that propel a documentary style.

ANALOG TRAILER
Curtis Matzke, Timothy Schafer, Angella Szynkowski
Location: Green Room, 1:15 PM
Category: Digital Media-Section 2, Oral
Mentor(s): Amol Pavangadkar (Telecommunication, Information Studies and Media)
This is a short film in the form of a trailer created for TC 442 at Michigan State University. We hope to expand the trailer into an actual film. The plot centers around an old hermit who is thrown out into the real world when his record player breaks and he meets three twenty-something slackers...who intend to rob him. They doubt their plan, however, as they learn more about each other and their relationship grows.

A FURTHER EXAMINATION OF THE CORRELATES OF NARCISSISM USING THE NARCISSISTIC PERSONALITY INVENTORY (NPI) AND THE PATHOLOGICAL NARCISSISM INVENTORY (PNI)
Kendal Maxwell
Location: Ballroom, 9:30 AM - 11:30 AM
Category: Psychology-Section 1, Poster
Mentor(s): Brent Donnellan (Psychology)
Narcissism is a personality trait that reflects inflated self-concept and thoughts of grandiosity. The actual concept and how to define it is the subject of an on-going debate. My study consisted of examining correlations between the NPI (Narcissism Personality Inventory) and the PNI (Pathological Narcissism Inventory) and a number of independent variables such as: gender, race, overindulgent parenting, parental warmth, self esteem programs, and technology usage of the website Facebook. My study also compares the magnitude of these correlations to correlations between the PNI and the same set of independent variables to the NPI. The reason for looking at two different inventories is because the NPI is linked to testing what many refer to as “normal narcissism” and the PNI is linked to testing “negative narcissism” and “pathological narcissism”. By using two different inventories I was able to compare how correlations to different independent variables related to narcissism and whether particular variables related more or less to a certain subtype of narcissism itself.

POTENTIAL USE OF BIOMARKER CONTAINING WHEY PROTEIN FILMS AS A MEANS TO DETECT ESCHERICHIA COLI CONTAMINATED MEAT PRODUCTS
Kevin Mazor
Location: Ballroom, 9:30 AM - 11:30 AM
Category: Health, Food, and Wellness, Poster
Mentor(s): Zeynep Ustunol (Food Science and Human Nutrition)
Escherichia coli. contamination of meat products causing food borne illnesses is a worldwide problem. Currently, there are no tests available to determine the contamination of a meat product at the consumer level. The current research involved designing a procedure to determine if the biomarker 4-Methylumbelliferyl B-D-galactopyranoside incorporated into a whey protein-based film could serve as a suitable detection method for B-galactosidase, an enzyme produced by E.coli, allowing the film to be used to detect E.coli contamination. The development of this procedure, stability of B- galactosidase while it remains in contact with the film, and the limits of detection will be reported.

CAFETERIA FOOD WASTE
Emily McCandless, Clayton Meyers, Kelly Simons
Location: Parlor C, 11:00 AM
Category: Environmental and Natural Resources, Oral
Mentor(s): Steven Safferman (Biosystems and Agricultural Engineering)
The purpose of this project is to analyze and determine the role of the style of food service in the amount of post consumer waste that is produced. The study will compare the buffet style, where food is self serve, to the made to-order-style, where food is cooked or served to the consumer by a cafeteria employee. The reason for this study is to evaluate the effectiveness and efficiency of the University-wide switch to made to-order-style in the past year. This study will be accomplished in two ways: by comparison to a similar study that was run in 2006 by Dr. Dana Kirk and by sending out survey forms to students who use the cafeteria for their feedback. The study methods for the comparison study are to weigh post consumer waste as the food is being thrown out for three full work days, two during the work week and one on the weekend. This is the same method as those used by the 2006 study, when the university was under buffet style serving. The survey will ask consumers which style they prefer and how much food they feel they are wasting in each style. The results of this study have not been found yet, as the university has granted the project permission recently and the project has not actually been performed yet. The study is expected to be done in the next couple weeks.

CHARACTERIZATION OF RECOMBINANT SMALL BREAST EPITHELIAL MUCIN (SBEM), A PROMISING BREAST CANCER BIOMARKER
Mary McCarthy
Location: Gold Room, 9:30 AM - 11:30 AM
Category: Cell Biology, Genetics, and Genomics-Section 2, Poster
Mentor(s): Richard Miksicek (Physiology)
Mucin-Like 1/Small Breast Epithelial Mucin (MUCL1/SBEM) is a gene that codes for a small 90-amino acid polypeptide of unknown function. SBEM expression is restricted almost exclusively to human mammary epithelial cells, making it a potentially valuable biomarker for diagnosis of breast cancer. The SBEM peptide is predicted to undergo extensive post-translational modification. For this reason, methods were developed to express SBEM protein in cultured human cells, where it would be properly modified and more easily purified. Because antibodies recognizing the native SBEM protein are not currently available, an epitope-tagged version of SBEM protein was generated in order to facilitate its purification. Using this method, efforts were undertaken to express and purify the SBEM protein with the ultimate goal of preparing antibodies for use in breast cancer diagnostics. Sequence analysis shows that the SBEM peptide contains a well-defined 20-amino acid signal peptide and 3 copies of a tandem 8-amino acid repeat containing multiple threonine residues, a feature that is characteristic of O-glycosylated proteins. Consistent with the prediction of glycosylation, the unmodified form of SBEM protein is 9 kDa in size, but the mature form found in cell lysates is ~17 kDa based on SDS-PAGE analysis. Since cancer cells are known to show aberrant patterns of glycosylation, further characterization of SBEM glycosylation in normal and cancerous cells will be required to fully develop its potential as a breast tumor marker.

THINKING TOOLS USED IN PRIMARY AND SECONDARY EDUCATION TEXTBOOKS
Philip McCarthy, Johnathon Bezak, Kathleen Conley
Location: Ballroom, 9:30 AM - 11:30 AM
Category: Psychology-Section 1, Poster
Mentor(s): Michele Root-Bernstein (Theatre)
Problem: Professors Root-Bernstein propose that creative scientists use thirteen “thinking tools”: observing, imaging, abstracting, pattern recognition, pattern forming, analogizing, body thinking, empathizing, dimensional thinking, modeling, playing, transforming, and synthesizing. But Professors Lownds and Poff find few of these “thinking tools” in science textbooks. Hypothesis: “Thinking tools” consistent with “scientific method”, e.g., observing, patterning, and modeling, are more likely to appear than subjective ones, e.g., empathizing, body thinking, playing. Methods: Science textbooks used in third, fourth, fifth, seventh, and tenth grades were read by groups of three or four students and analyzed by concensus evaluation for use of “thinking tools in text, illustrations, captions, exercises and activities, problem sets, and indexes. Total instances of each tool in each category was compiled and compared. A weighted value for each “tool” was produced according to the number of categories a tool appeared in. The data were also adjusted by dividing the number of uses of each tool (or its weighted value) by the number of pages evaluated. Results: Body thinking, empathizing, play, transformation, and synthesizing will be analyzed in this section of the research, the other results will be analyzed by other members of the group. So far the hypothesis has not been rejected, the more subjective contents are less evident in the text.

SCORPION TAPHONOMY: CRITERIA FOR DISTINGUISHING FOSSIL SCORPION MOLTS AND CARCASSES
Victoria McCoy
Location: Ballroom, 9:30 AM - 11:30 AM
Category: Physical Sciences, Poster
Mentor(s): Danita Brandt (Geological Sciences)
The ability to distinguish fossil arthropod carcasses from their molts is necessary for a more complete understanding of the arthropod fossil record and for more accurately assessing the role of fossil arthropods in paleoecosystems. Taphonomic characteristics, e.g., recurrent patterns of disarticulation of exoskeletal elements, are the primary data that have been used to differentiate fossil exuvia and fossil carcasses among arthropods. This study documents recurrent taphonomic patterns in modern scorpion carcasses and molts and extends these patterns to the fossil record to define criteria by which fossil scorpion molts might be distinguished from fossil scorpion carcasses. The three most useful and statistically significant characters in making the scorpion carcass/molt distinction are: position of the chelicerae (drawn in or extended); position of walking legs (folded or splayed); and body line (straight or curved). Two other characteristics, the position of pedipalps and presence or absence of telescoped segments, approach statistical significance and are also potentially useful. Disarticulation data are not as useful for distinguishing fossil scorpion molts and carcasses, because there are no statistically significant differences in length of time to total disarticulation or in the sequence of disarticulation between scorpion molts and carcasses. Among extant arthropods, scorpions possess the

body plan most similar to that of the extinct eurypterids. Therefore, the taphonomic criteria developed for distinguishing fossil scorpion molts and carcasses may have implications for understanding molting among eurypterids.

FRACTAL DIMENSION ANALYSIS OF NATURAL BIOFILMS
Jessica McCully
Location: Ballroom, 9:30 AM - 11:30 AM
Category: Microbiology, Immunology, and Infectious Disease-Section 2, Poster
Mentor(s): Frank Dazzo (Microbiology)
Biofilms are diverse, 3-dimensional microbial communities that colonize solid surfaces in various environments. Microbial biofilms contribute to many diseases in humans; they benefit bio-technologies such as wastewater treatment systems, and are important for cell survival. An important key to better understanding biolfilm structure and function is the architectural design of these systems. Fractal dimension is a useful quantitative tool for studying biolfilms because it measures the infinite edges of an object with an irregular perimeter. We are exploring computer-assisted microscopy approaches to analyze 5 different types of biofilm architecture by eleven different fractal dimension methods (Dilation, Euclidean Distance Mapping, Box- Counting, Fast, Fast(Hybrid), Cumulative-Intersection, Parallel-Lines, Mass-Radius(Long), Mass-Radius(Short), Corner(Count), and Corner(Perimeter)). The objectives of this study are to optimize the threshold settings for image analysis of fractal dimensions, and to rank the power of fractal methods to discriminate biofilm architectures for implementation into our CMEIAS image analysis software. My preliminary work indicates quantitative image analysis of fractal dimension can distinguish the variability in a biofilm's border, and brightness threshold settings significantly affect the fractal value measured. I predict that Euclidean Distance Mapping, Box-Counting and Fast will show the most discriminating power and will work best with CMEIAS.

GEOGRAPHIC RACIAL EQUALITY BETWEEN WHITES AND ASIANS IN NAPA COUNTY, CALIFORNIA
Amanda McFee
Location: Gold Room, 9:30 AM - 11:30 AM
Category: Social Science: General-Section 1, Poster
Mentor(s): Joseph Darden (Geography)
In this paper, I examine the extent to which geographic racial equality exists between Whites and Asians in Napa County, California. I hypothesize that 40 percent of the municipalities in Napa County, California would be areas of geographic racial equality. Using data from the 2000 Summary Tape File 4 collected and released by the U.S. Bureau of the Census, the differences in median household income, the percent of each group's population aged 25 and over with a bachelor's degree or higher and the percent of each group's population 16 and over with a professional or managerial occupation were compared. The level of residential segregation was determined by computing an index of dissimilarity by census tract. Areas that were equal in socioeconomic status and had an index of dissimilarity below 50 qualified as areas of geographic racial equality. I concluded that Asians have reached parity with whites in two out of the five cities within Napa County thus accepting my hypothesis. I found that in Napa County, 65 percent of all whites and 75 percent of all Asians are living in areas of geographic racial equality.

EDIBLE FILMS
Allen McGee
Location: Ballroom, 9:30 AM - 11:30 AM
Category: Health, Food, and Wellness, Poster
Mentor(s): Zeynep Ustunol (Food Science and Human Nutrition)
Edible films provide protection to a food product by acting as a barrier to moisture migration and preventing the releasing of gases important in food deterioration. Edible films improve upon the appearance, flavor, aroma and safety of foods. Edible films can also be used for antimicrobial purposes as well as carry antioxidants which can prevent lipid oxidations in meat products. The objective of this research is to determine if whey protein based edible films could be used as a carrier for liquid smoke that is used in meat processing. Furthermore, since liquid smoke has been shown to decrease microbial activity, effect of liquid smoke (incorporated into whey protein based films) on inhibition of Listeria Monocytogenes will be studied. Preliminary results have shown a decrease in pH due to incorporation of liquid smoke into the film forming solutions. This decrease in pH may play an important role in decreasing microbial activity. Inhibition of Listeria Monocytogenes will also be reported.

THE EFFECTS OF ACID SPHINGOMYELINASE DEFICIENCY ON BONE
Sarah McKee
Location: Gold Room, 9:30 AM - 11:30 AM
Category: Cell Biology, Genetics, and Genomics-Section 2, Poster
Mentor(s): Laura McCabe (Physiology)
Bone formation is a dynamic process which is regulated by many factors. Sphingomyelinases are known to break down sphingomyelin into ceramide which regulates multiple cellular processes critical for bone development and remodeling. Therefore, we hypothesized that acid sphingomyelinase would affect bone formation. My research focuses on the effects of acid sphingomyelinase gene knockout on bone formation and diabetic bone. The changes will be measured through body parameters, mRNA expression of bone, fat, and cartilage markers and microCT data. I recently found that both genders of knockout mice have lower fat pad mass than wild type mice. Examination of bone parameters indicate that in male and female knockout mice tibia bone length is shorter by four and five percent, respectably. Also, there is an increase in the inner and outer perimeter of the cortical bone in the knockout mice, which leads to increased marrow area. Bone mRNA analyses indicate that the levels of PPARgamma, an adipogenesis mRNA marker, are significantly increased in the knockout mice. These findings suggest a role for sphingomyelinase in the regulation of bone formation and potentially marrow fat deposition. By understanding how bone growth is regulated in bone, we can develop therapeutics that target the harmful bone loss mechanisms observed with aging and in diseases such as diabetes.

EXPRESSION OF HSFA1 GENE IN TOMATO (SOLANUM LYCOPERSICON)
Brad Meyer
Location: Parlor A, 10:15 AM
Category: Agriculture and Animal Science, Oral
Mentor(s): Ryan Warner (Horticulture)
The transcriptional activator protein HsfA1 has been described as a 'master regulator' of the heat stress response in tomato (Solanum lycopersicon). Previously, plants overexpressing the HsfA1 gene (OE plants) were shown to exhibit superior thermotolerance to wild type (WT) plants following short-term exposure to extreme temperatures (40-50 °C), while plants with silenced HsfA1 expression via cosupression (CS plants) were severely compromised in thermotolerance. Tomato crop yields have been shown to decrease in temperatures only a few degrees above the optimal temperature. However, there has been little research on the influence of HsfA1 expression level on growth and yield under chronic, mild high temperature exposures that are more likely to be experienced by crops in temperate climates. Therefore, growth, flowering and fruit yield of WT, OE and CS plants are being evaluated under three temperature regimes: constant 22°C, 28/22 °C (day/ night) or 32/26 °C (day/ night), to test the hypothesis that OE plants will exhibit superior yield under high temperatures, while CS plants will be compromised in growth and yield. Preliminary data indicates that growth of CS plants is compromised at 32/26 °C, with older leaves developing necrotic lesions. Comparisons of physiological performance (photosynthetic rate, night respiration and biomass), flower production (including flower number, pollen production and pollen viability) and fruit set will be presented.

CERAMIC POWDER PROCESSING
Sarah Meyer, Megan Buczkowski, Chelsea House, Kaitlin Tyler
Location: Gold Room, 1:30 PM - 3:30 PM
Category: Engineering, Computer Sci, and Math-Section 2, Poster
Mentor(s): Melissa Baumann (Chemical Engineering and Materials Science)
By optimizing the parameters of powder manufacturing and sintering procedures, ceramic hydroxyapatite samples can be prepared to possess properties ideal for use in biomedical applications. Hydroxyapatite is typically used as a synthetic bone replacement material and can be studied by performing cell studies. However in order to perform these studies, dense samples with small grain sizes are needed. Manufacturing parameters that will produce these desired properties were investigated. In order to prepare the samples, the powder was massed and uniaxially pressed at various pressures to determine which parameters will give a high green density. The samples were then sintered at various temperatures and times to optimize the final density while minimizing the grain size. From these trials, the powder manufacturing procedure was determined to use 2.5g of Hydroxyapatite powder and under uniaxially pressure for 1 minute under a force of 5000lbs. It was found that the sintering process should have a holding temperature of 1360°C for 4 hours, with a ramp rate of 10°C/min. This gave samples with densities that were on average 94% of the ideal density (3.16 g/cm3), and the grain sizes as small as possible since they were the same size given by the vendor (4-6 µm). Through optical microscopy and SEM, the samples were proven to have spherical pores with a uniform distribution. This study emphasizes the importance of the parameters of powder manufacturing and sintering processes so that optimal density and grain sizes can be obtained to use the samples in further studies.

TALENT IN THE NEW ECONOMY
Anthony Mianecki, Erika Huber, Nicholas Laverty, Jennifer Seager
Location: Lake Erie Room, 9:45 AM
Category: Social Science: General-Section 1, Oral
Mentor(s): Bryan Ritchie (International Relations)
Retaining smart, innovative young people is critical to the creation and maintenance of an innovative and entrepreneurial economy. We are attempting to understand what keeps or draws graduates to a city after graduation. Why have some cities been able to do this better than others? We hypothesize that local innovation systems are critical to keeping innovative 18-25 year olds in an area. An innovation system is comprised of institutions that facilitate the flow of technology and ideas between people. Innovation systems must extend to include that demographic as 18-25 year olds and be focused on keeping those individuals around to ensure the vitality of the network for the next generation. The components of our research are listed below:1.Survey analysis: Will discern what 18-25 year olds are looking for in place. Survey designed by the target audience, gets at exactly what new graduates want and what would keep them in Michigan. 2.Comparative SWOT (strengths, weaknesses, opportunities, threats) analysis: Provides a structural analysis of 9 cities similar to Lansing. 3.Qualitative research (5 cases): We will be traveling to other college towns in the Midwest to see how Lansing compares. This report will explain how to focus innovation systems on college graduates. The results garnered from these research projects will allow for a series of recommendations that will provide a starting point for the Lansing area and Michigan as a whole. The results, however, will be applicable to any city in the country.

MOLTEN LIGHT: THE INTERTWINED HISTORY OF STEEL AND PHOTOGRAPHY
Julie Mianecki, Kelly Caldwell, Josh Rickert
Location: Lake Superior Room, 1:45 PM
Category: Communication Arts and Sciences, Oral
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 and death of the industry has been chronicled by many talented photographers, and their images have allowed steel's prominence to live on through images. The planned exhibition, Molten Light: The Intertwined History of Steel and Photography, is a comprehensive examination of the work of photographers who have shaped the way steel is envisioned by the public in aesthetic, social, political and historical terms. In addition to the photographic exhibition, the project includes two books, development of curricular material and Web content. As the project has taken shape, our responsibilities have undergone a series of parallel transformations. While we were previously involved in preliminary research, bibliographic and database development, organizational tasks and image selection, our team of research assistants is currently transitioning to involvement in the shaping of the final exhibition. This involves researching specific photographs and photographers, assisting in preparations for grant applications, working with submissions to journals and other publications and overall contributions to the thematic development of

the project. Our goal as a team is to help put a set of photographs into perspective for an audience. Our presentation will discuss several of the diverse tasks we have been involved with as research assistants and how these tasks have contributed to the project as a whole.

COMPARISON OF ELECTRICALLY ACTIVE POLYANLINE MAGNETIC NANOPARTICLES TO COMMERCIALLY AVAILABLE BEADS FOR CONCENTRATION OF BACTERIA FROM FOOD

Hanna Miller

Location: Gold Room, 9:30 AM - 11:30 AM

Category: Engineering, Computer Sci, and Math- Section 1, Poster

Mentor(s): Evangelyn Alocilja (Biosystems Engineering)

Electrically active polyaniline magnetic (EAPM) nanoparticles consist of an iron oxide core with a polymerized aniline outer shell. Antigen specific antibodies are then bound to the polyaniline. The magnetic properties of the nanoparticles and target-capturing capabilities of the antibodies allow for the removal of the EAPM nanoparticles and antibody bound bacteria from the food matrix. In this research EAPM nanoparticles were synthesized and used for the capture of bacterial cells from food matrices. Specifically, the capture efficiency of the nanoparticles for Bacillus cereus, Bacillus anthracis, and Escherichia coli were analyzed from lettuce, ground beef, and whole milk. The capture efficiency of E. coli by the EAPM nanoparticles was then compared to that of commercially available immunomagnetic beads specific to E. coli. The EAPM nanoparticles were found to have higher capture efficiencies from lettuce and whole milk when compared to the commercially available beads for all bacterial strains tested. The two capture methods preformed similarly with contaminated ground beef. These results show the EAPM nanoparticles have the potential of being an improved alternative to commercially available immunomagnetic beads.

PRONUNCIATION VARIATION IN CONSONANTS IN INFANT-DIRECTED SPEECH

Amanda Millett

Location: Ballroom, 9:30 AM - 11:30 AM

Category: Communication Arts and Sciences, Poster

Mentor(s): Laura Dilley (Communicative Sciences and Disorders)

The process by which children learn language is a puzzle; knowledge of the acoustic details of speech to which children are exposed early in life can shed light on this process. Assimilation is one type of variation where the pronunciation of words ending with the consonants /t/, /d/, or /n/ changes, depending on the following word, so that "green ball" can be pronounced "greem ball." While consonant pronunciation variability has been studied rather extensively in speech directed to adults, little work exists on the variability in speech to infants. In two studies, we examined pronunciation variation in mothers' speech to her infant and an adult. First, eight trained phonetic analysts classified tokens of word-final /t, d, n/ as having their normal canonical pronunciation or a variant pronunciation (assimilation, deletion, or glottalization) to determine whether infants receive the same acoustic input as adults or if consonants are more carefully articulated in infant-directed speech. The frequency of assimilation was estimated in contexts where it theoretically could occur (i.e., before word-initial /b, p, m, g, k/ sounds). In the second study, changes in the acoustic speech signal were analyzed. Preliminary findings indicate low frequency of assimilation but a substantial degree of pronunciation variation in speech to infants. Understanding early speech exposure provides information relevant to the development of normal and disordered speech and language. Future work will examine speech to infants with hearing loss and the impact on a hearing-impaired child's later speech-language skills.

IDENTIFICATION OF A TOMATO SESQUITERPENE SYNTHASE IN LEAF TYPE VI TRICHOMES

Dennis Miner

Location: Gold Room, 9:30 AM - 11:30 AM

Category: Biochemistry and Molecular Biology-Section 1, Poster

Mentor(s): Robert Last (Biochemistry), Anthony Schilmiller (Biochemistry)

Trichomes are hair-like appendages that protrude from the epidermis of many plant species and are involved in the biosynthesis of specialized metabolites. These metabolites can serve to protect plants from insect infestation, but also contribute to the scent of flowers that can attract pollinators. Tomato trichomes produce significant amounts specialized metabolites of the terpene class including three sesquiterpenes: germacrene C, β-caryophyllene, and α-humulene. GC-MS analysis of type VI leaf trichomes compared to stem showed significant amounts of β-caryophyllene and α-humulene produced in leaf type VI glands, but not in trichomes from the stem. The amount of δ-elemene (the thermal degradation product of germacrene C from the inlet injection of the GC) remained the same in glands from both tissues. Searching the trichome EST database for sesquiterpene synthases revealed two highly expressed genes. The first, *SSTLE1*, encodes a protein that was previously shown to catalyze production of germacrene C *in vitro*, and was originally suggested to also produce β-caryophyllene and α-humulene (van der Hoeven et al., 2000; Besser et al., 2009). Another contig, that we named *CAHS* (for β-caryophyllene/α-humulene synthase), was found that is 91% identical at the nucleotide level to *SSTLE1*. EST counts for *CAHS* from leaf vs. stem trichomes showed an expression pattern matching that of β-caryophyllene and α-humulene production. From these observations, we hypothesized that CAHS is responsible for β-caryophyllene and α-humulene production in leaf. Activity assays using recombinant CAHS expressed in *E. coli* demonstrated that this enzyme produces β-caryophyllene and α-humulene using farnesyl diphosphate as substrate.

STABLE COMMUNITIES AND SHIFTING VOWELS

Autumn Mitchell

Location: Gold Room, 1:30 PM - 3:30 PM

Category: Social Science: General-Section 3, Poster

Mentor(s): Suzanne Evans Wagner (Linguistics)

The Northern Cities Shift (NCS) is the name for an accent change that affects the pronunciation of vowels in the English spoken in the Inland North Region. In particular, NCS is most common in urban, white communities; ethnic minorities and rural populations are less affected by the change. No previous studies have looked at NCS within American Indian communities. The current study examines whether English speakers from the tribal community in Mt. Pleasant, MI are affected by the NCS. Both American Indians and non-indigenous people recognize a difference in speech between these two groups. The goal of this project is to see if the NCS is a factor in this sociolinguistic pattern. Based on

established sociolinguistic principles, we hypothesize that American Indians will have minimal or no signs of NCS participation whereas white men from Mt Pleasant will have moderate involvement and white women will be fully shifted. We analyzed the speech of four American Indian and four white Mt. Pleasant residents. Results showed that white women are participating in NCS whereas all other subjects have minimal participation. This result is surprising as it shows that white men are more linguistically similar to American Indians than to white women. Therefore, the speech discrepancies between these ethnic groups are independent of NCS participation, motivated instead by another sociolinguistic factor. Further investigation is needed to establish what sociolinguistic variable distinguishes these two communities.

HOW DO THEY FEEL ABOUT ME?
Erik Mitchell
Location: Ballroom, 9:30 AM - 11:30 AM
Category: Psychology-Section 1, Poster
Mentor(s): Norbert Kerr (Psychology)
My experiment showcases how people are able to integrate facial cues, specifically in a social setting, to form an overall impression of how they are perceived. I also look at possible gender effects, determining if certain combinations of gender and face type produce more robust results. 100 participants took an online survey which depicted different combinations of faces in a spectrum of happy to disgusted in order to understand how the faces were processed.

APPAREL AND TEXTILE DESIGN
Shelly Moher
Location: Lake Huron Room, 1:15 PM
Category: Humanities and Peforming Arts-Section 2, Oral
Mentor(s): Theresa Winge (Apparel and Textile Design)
I am entering a dress that I have designed for my special topics in design class. It is a dress constructed using a subtraction patterning technique. With this technique every dress design comes out completely unique. I have adopted this technique and gave it my own twist by adding piping into the seams. There is a cape that goes along with the dress that has been French seamed which I can also explain the process. I am excited to explain the concept of my dress and to better educate people about a fashion designer's design process.

EFFECTS OF THE (S)PARTNERS FOR HEART HEALTH INTERVENTION ON DIET, PHYSICAL ACTIVITY, AND CVD RISK FACTORS AMONG 9-12 YEAR OLD OBESE CHILDREN
Kelly Montgomery
Location: Parlor A, 1:00 PM
Category: Health, Food, and Wellness, Oral
Mentor(s): Joey Eisenmann (Kinesiology)
To examine the effects of a school- and web-based intervention on diet, physical activity (PA), and cardiovascular disease (CVD) risk factors among 9-12 year old obese children. Subjects included 34 (11 intervention and 23 comparison) obese (body mass index, BMI $\geq 95^{th}$ centile) 5^{th} grade students. The (S)partners for Heart Health intervention is designed to promote healthy nutrition and PA behaviors using the Jump Into Foods and Fitness (JIFF) curriculum and engaging MSU students (Spartners) to case mentor via a web-based protocol. The comparison schools only receive JIFF. Pre- and post-intervention measures included the following: dietary behavior evaluated using the Block Food Frequency Questionnaire for Kids; self-reported PA and screen time; and a CVD risk factor profile (percent body fat, non-fasting blood cholesterol, C-reactive protein, blood pressure, and aerobic fitness). In total, 19% of all subjects in the study were obese. At baseline, % fat approximated 37% and a majority of subjects did not meet PA, screen time, or dietary recommendations. There were no significant differences in PA, screen time, dietary behaviors or CVD risk factors between groups following the intervention. From a clinical perspective, BMI centile was maintained in the experimental group. A majority of obese children in this study are not meeting recommendations for nutrition, PA behaviors and CVD risk factors. The results indicate a lack of effectiveness of the (S)partners for Heart Health intervention in obese children; thus intensive, clinically-based programs should be recommended for obese children.

POWER MASTER
Jonathan Moore
Location: Lake Superior Room, 3:00 PM
Category: Communication Arts and Sciences, Oral
Mentor(s): Brian Winn (Department of Telecommunication, Information Studies, and Media)
Power Master is a serious game aimed at helping engineering students learn about power plant and resource management. In the game, the student controls several power plants, and must meet expanding bases of demand, as well as maintaining a budget and meeting pollution standards. Furthermore, the player is responsible for doing maintenance on plants, and the construction of new plants to meet those rising demands. It was developed by several MSU students in the Games for Entertainment and Learning Lab under the direction of Associate Professor Brian Winn and Associate Dean for Special Initiatives Ronald Rosenberg. The game was first used in EGR 29 during the Fall 2009 semester.

BIOSHOCK PINBALL
Jonathan Moore
Location: Ballroom, 9:30 AM - 11:30 AM
Category: Communication Arts and Sciences, Poster
Mentor(s): Brian Winn (Department of Telecommunication, Information Studies, and Media)
Bioshock Pinball is a 3D video game created by several students during the Fall 2009 and Spring 2010 academic semesters. The project started as an attempt to make a next-generation game into a retro format, essentially a new game in old spirit. From this, the idea came to transform Bioshock, an award winning game developed by 2K Boston, into a virtual pinball table, a truly traditional format of gameplay. The development

team, consisting of five students, worked to create an experience that was true to traditional pinball machines, but captured many of the themes and mechanics of the original Bioshock. Additionally, making the game as polished as possible was a high priority for the team to both learn new techniques in game development using the Unity 3D game engine and to use it as a means of showcasing student work.

SEQUENCING ASSAYS EXCLUDE COMPOUND HETEROZYGOSITY FOR KCNJ10 AND SLC26A4 AS MAJOR CAUSE OF AUTOSOMAL RECESSIVE HEARING LOSS IN RELATED DEAF PATIENTS

Robert Moore

Location: Parlor B, 10:30 AM

Category: Cell Biology, Genetics, and Genomics, Oral

Mentor(s): Karen Friderici (Microbiology and Molecular Genetics)

Mutations in the SLC26A4 gene are primarily responsible for autosomal recessive non-syndromic hearing loss and Pendred Syndrome. Pendred Syndrome is a genetic disorder characterized by bilateral hearing loss at an early stage in childhood development. Here we sequenced the coding region of SLC26A4 in three related individuals, all of which may have nonsyndromic hearing loss. Genotyping using sequencing assays and restriction enzyme digests showed a monoallelic mutation of SLC26A4 in our three subjects. In general, novel mutations related to SLC26A4 have only been located on one chromosome. Non-syndromic deafness due to mutation of SLC26A4 is recessive and requires mutations on both alleles. Previous research has suggested that compound heterozygosity for KCNJ10 and SLC26A4 can cause recessive nonsyndromic deafness. We tested this hypothesis in our three subjects by sequencing the coding region of KCNJ10. Through haplotype analysis we were able to exclude digenic inheritance of KCNJ10 for one of these subjects. After analyzing the coding region of the Pendred gene for these individuals we have found no other candidate coding region mutations. Further haplotype analysis involving more relatives of the three related subjects will further assist in identifying the complex polymorphisms associated with this disorder.

RESEARCH ON MARS: LIMITATIONS IN A MARTIAN ANALOG ENVIRONMENT

Mike Moran

Location: Ballroom, 9:30 AM - 11:30 AM

Category: Physical Sciences, Poster

Mentor(s): Horace Smith (Physics and Astronomy)

Future Martian astronauts will encounter numerous obstacles during their multi-year mission, ranging from the hazards of interplanetary travel to interpersonal disputes. With the changes in both NASA's budget and their plan of planetary exploration, the need to develop strategies to work around these obstacles is more pressing than ever. The Mars Desert Research Station (MDRS), located near Hanksville, Utah, and managed by The Mars Society, aims to simulate a future Mars mission once the astronauts have already landed by imposing similar restrictions on the participants in order to test these strategies as well as experimental equipment. As a member of the eighty-ninth expedition to the MDRS, acting as crew astronomer, I encountered many of these potential challenges during my two weeks at the station. The radio telescope repairs and alterations were hampered by the restrictions imposed by the space suits and other extra-vehicular activity (EVA) limitations, while my actual research using the telescope was restricted by the relative location of Jupiter and the Earth's own ionosphere. Taking these variables into account, future Martian-based astronomers will have both an easier and more difficult time performing the same activities, based on the current NASA plans for Mars mission architecture and the differences between the two planetary dynamics.

TOXICITY AND PERSISTENCE OF BOTANICAL INSECTICIDES

Shannon Morey

Location: Parlor C, 9:45 AM

Category: Environmental and Natural Resources, Oral

Mentor(s): Dawn Reinhold (Biosystems Engineering)

As organic food continues to grow in popularity, research into the processes used to produce organic food grows in importance. This research studies the prevalence, persistence, and toxicity in the environment of insecticides that are approved for use on organic farms. Methods for detection of these compounds are being developed using liquid chromatography mass spectrometry (LCMS). Toxicity tests using Lemna minor (common duckweed) have been performed for one compound (tetracycline) with plans to conduct tests on more compounds in the near future. These toxicity tests have shown that duckweed can tolerate relatively high concentrations of tetracycline. However, observations during these tests indicate that over the course of the experiment tetracycline degrades into other compounds. Studies are currently being planned that will test how duckweed removes the insecticides of interest from aquatic ecosystems.

THE STATE BUDGET: COMPARATIVE ANALYSIS

Gennafer Musial

Location: Gold Room, 1:30 PM - 3:30 PM

Category: Social Science: General-Section 2, Poster

Mentor(s): Matthew Grossman (Political Science)

I will be examining Michigan's state budget along with the budgets of its neighboring states, Illinois and Indiana. Michigan's budget deficit falls in between that of these two states, making them good comparisons. I will be focusing on the expenditures and revenues of each state, and how much is put towards each person. I will also be outlining the pros and cons of each state's budget process and tax system, researching how each system has helped and harmed the state.

MOLECULAR CHANGES IN RIPENING BANANAS
Sara Muszynski
Location: Gold Room, 9:30 AM - 11:30 AM
Category: Biochemistry and Molecular Biology-Section 1, Poster
Mentor(s): Carl Boehlert (Materials Science and Engineering)
Bananas experience the ripening process in different stages. To the common eye this is seen as changes in color, ranging from green, yellow, and brown. Similarly, as ripening visually occurs, the cells of the banana experience biochemical changes. Among these changes include the deterioration of the cell wall and chlorophyll. This experiment chose to investigate those changes in the pulp and peel of ripening bananas using scanning electron microscopy. The most extreme stages of ripening were investigated as samples to exemplify the molecular changes associated with the apparent changes in color.

MICHIGAN STRAIGHT EDGE: THE CULTURE AND IDEOLOGY OF DRUG FREE YOUTH
Ahmad Naboulsi
Location: Lake Erie Room, 10:15 AM
Category: Social Science: General-Section 1, Oral
Mentor(s): Louise Jezierski (James Madison College)
Straight edge traces its origins back to the early 1980s as a response to the self-destructive and over indulgent lifestyle in the hardcore punk music scene. Today straight edge has become an international phenomenon with members in every country where punk music exists. While the original Washington D.C. straight edge scene is no longer the center of straight edge activity, membership still exists across the United States in varying numbers. Different groups of members have supplemented the basic straight edge creed of abstinence from drugs, alcohol, and promiscuous sex with additional philosophical and political tenets including vegetarianism, political activism, etc. Although the growth of underground or non-commercial music in Michigan has been sparse, straight edge continues to resonate with a number of Michiganders in different areas including members that were too young to ever experience the first wave of straight edge. This study analyzes the demographic, ideological, and cultural variations of straight edge membership in the state of Michigan and its prospects for future growth relative to Michigan's socioeconomic development.

NON-SPECIFIC HERBICIDES GENERATE REACTIVE OXYGEN, BUT DO NOT DAMAGE CHLOROPLAST DNA
Ashita Nagori
Location: Gold Room, 9:30 AM - 11:30 AM
Category: Cell Biology, Genetics, and Genomics-Section 2, Poster
Mentor(s): Barbara Sears (Plant Biology)
Photosynthetic organisms generate several reactive oxygen species (ROS) as byproducts of photosynthesis. ROS can interact with lipids, carbohydrates and proteins, causing oxidative damage to the chloroplast. Some non-specific herbicides also produce ROS and divert electrons from photosynthesis. Although ROS is capable of damaging DNA, the impact of photo-oxidation on chloroplast DNA (cpDNA) has not been carefully investigated. To examine this, we cultured the unicellular green alga Chlamydomonas reinhardtii in the presence of the herbicides Rose Bengal and Methyl Viologen (paraquat), which generate singlet oxygen and superoxide radicals respectively in the presence of light, and are known to cause damage to the photosynthetic apparatus. We sought to determine if cpDNA was damaged by these ROS insults by determining if spectinomycin resistance mutations were induced. Mutations to spectinomycin-resistance are due to base substitutions in the 16S rRNA gene, which is encoded in the cpDNA. When the cells were exposed to higher concentrations of Rose Bengal or Methyl Viologen, we observed that the chemicals are extremely lethal to algal cells but they are not mutagenic. Our interpretation is that the photosynthetic apparatus is much more susceptible to damage caused by reactive oxygen, than is the chloroplast DNA.

MICHIGAN RESIDENTS OPINIONS ON GLOBAL WARMING
Timothy Nance, Brendan Lammers
Location: Ballroom, 9:30 AM - 11:30 AM
Category: Environmental and Natural Resources-Section 1, Poster
Mentor(s): Frank Lupi (Agricultural, Food, and Resource Economics)
Global Warming and climate change are major topics in media coverage, and are commonly debated political talking points. Last year, the US House of Representatives passed a clean energy bill, and Michigan has several energy and global warming related bills that have recently been introduced. To inform these issues, our research focuses on the opinions of Michiganders concerning Global Warming, and their willingness to pay for Global Warming improvements. The data was collected via a mail survey that consisted of a pre-notice letter, a first round of surveys,and reminder postcards and a second round of surveys to those who had not responded. The sample size was 6,000 randomly selected Michigan residents. The final response was 41%. The survey had 55 questions. There were both quantitative and qualitative questions. In particular, respondents were asked to state their opinions on Global Warming in different questions, one of which was "How concerned are you about Global Warming?", of which 33% of respondents marked "Very Concerned", and 40% marked "Somewhat Concerned". There were also 4 open ended questions. The open ended questions asked the respondents to write their top two reasons for voting their respective ways. We are using these open ended questions to qualitatively analyze why people responded the way they did. We will combine that analysis along-side quantitative data, to better our understanding of how Michiganders feel about Global Warming.

HIGHBROW COMICS AND HISTORICAL TRAUMA
Samara Napolitan
Location: Ballroom, 1:30 PM - 3:30 PM
Category: Humanities and Peforming Arts, Poster
Mentor(s): Stephen Rachman (English)
This project investigates the acceptance of comics as a medium and as a serious art form. In 1985, Will Eisner, a leading advocate of comics, said, "[Unless] comics address subjects of greater moment how can they hope for serious intellectual review? Great artwork alone is not

enough."Twenty-five years later, comics are praised among intellectual institutions as high culture works. Several of these comics, commonly known as "graphic novels," concern historical and personal trauma. Since comics function as transmitters of memory due to their narrative techniques and tools, they are particularly well-suited to convey the powerful effects and emotions associated with trauma. In attempting to communicate the subject of trauma, how have comics elevated the form? The project explores the correlation between the representation of traumatic memory in comics and the rise of comics in high culture. This is done through the analysis of three comic narratives: In the Shadow of No Towers by Art Spiegelman, Persepolis by Marjane Satrapi, and Fun Home by Alison Bechdel.

QUANTIFYING POLYHYDROXYBUTYRATE IN HUMAN PLASMA
Khalil Nasser
Location: Ballroom, 9:30 AM - 11:30 AM
Category: Microbiology, Immunology, and Infectious Disease-Section 1, Poster
Mentor(s): Rosetta Reusch (Microbiology and Molecular Genetics)
Of the many molecules present in human plasma this work focuses on polyhydroxybutyrate (PHB). The breakthrough presented here consists of a clinical assay designed to encourage further research on PHB and its effects on the human body in varying concentrations. This is the first method designed to quantify the ketone body in human plasma. The chosen method of PHB quantification begins with the chemical hydrolysis of polyhydroxybutyrate into B-hydroxybutyrate requiring a 1:1 ratio of 0.4 N sodium hydroxide (NaOH) and a human plasma sample. The solution must be heated at 42°F for exactly 30 minutes then put directly on ice. A 10µl sample of the treated solution is added to a 200µl solution of a purchased reagent mix designed to bind to B-hydroxybutyrate which is then left to sit at room temperature for 5 minutes before measuring its absorbance with a spectrophotometer at a wavelength of 505nm. This absorbance is then used to subtract the initial concentration of B-hydroxybutyrate from the plasma sample to produce the total PHB concentration. From this design, investigators can now use this method as a resource to formulate further correlations between plasma PHB concentrations and chronic diseases such as diabetes mellitus and atherosclerosis.

DEHUMANIZING DESIRE: EUROPE'S SUBJUGATION OF THE JAMAICAN FEMALE SLAVE
Jasmine Newby
Location: Tower Room, 10:30 AM
Category: History, Political Science, and Economics, Oral
Mentor(s): Austin Jackson (RCAH)
The purpose of this research project is to examine the sexual nature of the presentations of the enslaved Black women in Jamaica. In the British West Indies there were two different, almost paradoxical representations of Black women that chiefly emerged from slave owners and other Europeans from the 17th to 19th century. On the one hand, European men described and saw African women as subhuman, akin to animals. At the same time, however, enslaved African women were portrayed as the object of European sexual desire. What accounts for these contradictory perceptions? A look at the literature and images of the era surrounding Black women suggests that the sexual exploitation of African slave women in Jamaica created a new sexualized aesthetic. It is this aesthetic that allowed for the Black female body to be venerated and dehumanized, seen as both an uncivilized African Hottentot and an erotically desirable Sable Venus. The most significant part of this perception was how it shaped the entire existence of a Jamaican female slave. In this study I will examine a wide range of primary and secondary sources to describe how these women were sexually envisioned in the psyche of European men. These sources -- travel narratives, diaries of slave owners and other texts -- offer insight towards a more complete representation of Black women's experiences in Jamaica, while also giving voice to a largely neglected experience within the African Diaspora in the Caribbean.

MANUMISSION WITHIN THE MATRIX: JAMAICAN SLAVE WOMEN OF THE EARLY 19TH CENTURY AND THE MATRIX OF DOMINATION
Jessica Newby
Location: Tower Room, 11:45 AM
Category: History, Political Science, and Economics, Oral
Mentor(s): Austin Jackson (Arts and Humanities)
The purpose of this research project is to explore the psychosocial impact of 19th century Jamaican slavery upon Jamaican mulatto slave women through their lived experiences. Current historical research is limited, as it fails to address the uniqueness of the mulatto slave woman's life in Jamaican society. A closer study of these women's experiences is important for a more critical understanding of slavery in the Caribbean. This research project explores the interaction of psychosocial conditions that were responsible for the oppression and resistance of mulatto slave women. The use of Patricia Hill Collins' "matrix of domination" theory will enable an analysis of 19th century historical and cultural texts in order to reveal the ways in which mulatto slave women exercised their own means of agency, formulated resistance cultures, and found means of organizing community in the midst of their own oppression. This Black Feminist perspective challenges current Eurocentric, masculinist scholarship of this time period by placing the experience of the mulatto slave woman at the center of analysis. Collins' framework provides a useful means of understanding the complexities of the psychological impacts of slavery for those female slaves of "mixed-race" in Jamaica. It reveals the ways in which these women discovered their own means of exercising their own agency, and affected the greater spectrum of Jamaican slave society itself. Understanding these dynamics allows for an improved understanding of themes of accommodation and resistance that are largely left neglected within existing research of this topic.

EFFECTS OF PALMITIC ACID ON THE UNFOLDED PROTEIN RESPONSE IN HEPG2 CELLS
Catherine Nezich
Location: Gold Room, 9:30 AM - 11:30 AM
Category: Biochemistry and Molecular Biology-Section 1, Poster
Mentor(s): Christina Chan (Biochemistry and Molecular Biology; Chemical Engineering and Materials Science; Computer Science and Engineering)
The Unfolded Protein Response (UPR) is a set of signal transduction pathways initiated in the endoplasmic reticulum (ER stress) and used by eukaryotic cells to adapt to perturbations in protein folding. It is thought to be activated in diseases like Alzheimer's Disease, cancer, and

diabetes. Past research shows that ER stress can be induced by saturated free fatty acids such as palmitate (PA), modulating calcium homeostasis. Our lab has demonstrated that PA inhibits the phosphorylation of PKR and other cytosolic kinases by binding to the conserved ATP binding site. The purpose of this study is to determine whether PA also binds directly to UPR transmembrane kinases, PERK and IRE1, to activate its signaling. Human hepatoblastoma (HepG2) cells were treated with various PA concentrations (0-0.4 mM) for 0-48 hr and analyzed by western blot for IRE1, PERK, and BiP (UPR misfolded protein sensor protein). Preliminary results show that palmitate may induce the expression of BiP and phosphorylated PERK and IRE1. However, the effect of PA on the transmembrane kinases is opposite to what was observed with PKR, suggesting that PA may have different interactions with cytosolic versus transmembrane kinases. These results also raise the possibility that PA may have implications on the efficacy of current drug therapies that target kinases. We are currently working to determine the effects of PA on the protein expression levels of several downstream signaling molecules in the UPR, as well as isolating and purifying IRE1 for PA- and ATP- binding studies, as previously performed with PKR.

HORMONAL CONTROL OF PROGESTERONE RECEPTOR A EXPRESSION IN POSTMENOPAUSAL BREAST TISSUE

Kim Nguyen

Location: Gold Room, 9:30 AM - 11:30 AM

Category: Cell Biology, Genetics, and Genomics-Section 1, Poster

Mentor(s): Mark D. Aupperlee (Physiology), Sandra Z. Haslam (Physiology)

Hormone replacement therapy (HRT) is used to ease menopausal symptoms in postmenopausal women. However, studies have shown that HRT increases the risk of breast cancer. Specifically, estrogen (E) and progesterone (P) HRT increases breast cancer risk above the risk with E alone. In addition, E+P HRT increases proliferation compared to E alone HRT further establishing the importance of P in impacting breast cancer risk. P acts through two isoforms of the progesterone receptor (PR), PRA and PRB. Changes in the expression of PRA and PRB have been linked to early breast cancer development. This study focuses on the effects of HRT on the expression of PRA in archival postmenopausal human breast tissue. The tissue was collected from women who were categorized into three HRT treatment groups: no HRT, E alone HRT, or E+P HRT. Immunohistochemistry was performed using a mouse monoclonal anti-PRA antibody to examine PRA expression and localization. We found that E HRT increased the expression of PRA relative to no HRT. E+P HRT also increased PRA expression compared to no HRT but decreased expression compared to E-alone HRT. PRA expression was more prevalent in the ducts compared to the terminal duct lobular unit. These results suggest that similar to studies in the mouse and rat, PRA expression in the human breast is hormonally regulated and that PRA expression is significantly increased in the presence of E. Future studies are necessary to further examine the relationship between HRT, PRA expression and PRB expression in the human breast tissue.

THE EFFECT OF TGF-B1 ON THE MYOEPITHELIAL: EPITHELIAL CELL RATIO IN THE BOVINE MAMMARY GLAND AT ONE WEEK FOLLOWING THE CESSATION OF MILK REMOVAL

Aisling Nolan

Location: Ballroom, 1:30 PM - 3:30 PM

Category: Agriculture and Animal Science, Poster

Mentor(s): Karen Plaut (Animal Science)

Mammary alveoli consist of secretory epithelial cells and contractile myoepithelial cells. When milk removal ceases, the mammary gland involutes, causing epithelial cell death (apoptosis) and the alveoli to collapse. It is not known if only epithelial cells die during involution. Transforming growth factor-beta 1 (TGF-β1) inhibits epithelial cell growth and stimulates apoptosis. Its expression changes throughout mammary development, the highest levels being expressed during mammogenesis and involution. The purpose of this study was to determine if TGF-β1changes the ratio of myoepithelial to epithelial cells in the mammary tissue 1 week following milking cessation. Our hypothesis was that TGF-β1would increase the ratio of myoepithelial to epithelial cells. A mammary biopsy was taken from 7 Holstein cows 1 week following milking cessation. Biopsied tissue was incubated for 2 hours in Waymouth's media with insulin, hydrocortisone, and either 0 or 10ng of TGF-β1. Expression of smooth-muscle alpha actin (SMA), which is expressed by myoepithelial cells, was detected using immunohistochemical staining. Images were captured at 200x, and Image Pro Plus software was used to manually tag epithelial and myoepithelial cells stained with SMA. Results from a paired t-test indicated that TGF-β1 had no effect on the myoepithelial to epithelial cell ratio. There were 87±5% epithelial and 13±5% myoepithelial cells in tissues treated with 10ng TGF-β1, and 87±4% epithelial and 13±4% myoepithelial cells in tissues treated with 0ng TGF-β1. TGF-β1 may not have acted as expected because the biopsy was taken when active involution may have ended.

HANDWASHING IN CHILDCARE CENTERS

Paul Nowinski, Robert Koke

Location: Ballroom, 9:30 AM - 11:30 AM

Category: Communication Arts and Sciences, Poster

Mentor(s): Maria Lapinski (Communication)

Handwashing prevents the spread of disease, and the world has recently been reminded of the importance of handwashing with the spread of viruses like H1N1. This study is concerned with the handwashing behavior of childcare center workers, because their handwashing behavior can reduce the spread of illness among young children with weak immune systems. This study uses the theory of reasoned action (Azjen & Fishbein, 1980) to explain how childcare center workers make decisions about handwashing in response to different situations in their workplace. The theory of reasoned action suggests that a person makes a decision on the basis of three components: one's attitude towards a behavior, the subjective norms about the behavior, and the percieved behavioral control one has over that behavior. This study tests the relationships between those components and reported handwashing behavior among childcare workers. Results suggest that attitudes, subjective norms, and percieved behavioral control are all significantly related to handwashing behavior. Implications of this study for health communication campaigns are discussed.

ACCESS TO EDUCATION
Caitlin O'Neill
Location: Gold Room, 1:30 PM - 3:30 PM
Category: Social Science: General-Section 2, Poster
Mentor(s): Marya Sosulski (Social Work)
The student will further research the results of the Access to Education Project, associated with the Illinois Families conducted by Dr. Marya Sosulski. This project is focused on women who are on welfare and trying to maintain a job and/or receive an education. This government program had good intentions; however, there is some debate on whether it was truly successful. By using an extended case method, the student will analyze and present why so few participants in the study were successful in maintaining a job or receiving an educational. Furthermore, barriers to jobs and education will also be analyzed as contributing factors. The most successful woman maintained a job where she was trained in modules. Thus, leading the student to believe that jobs that train in educational units are the most successful.

INSIDE THE BIOS AND PROCESSOR
Hector Orozcomurillo
Location: Gold Room, 9:30 AM - 11:30 AM
Category: Engineering, Computer Sci, and Math- Section 1, Poster
Mentor(s): Carl Boehlert (Chemical Engineering and Materials Science)
Now is an era where computers are part of day-to-day life. It is rare to find someone who doesn't know how one looks like. Today's youth operates computers with natural ease. However, few are familiar with the interior of their computer. The obvious parts are simple to name, computers have chips and hard drives, etc. What they are made of is a mystery and why they are made with the materials they are composed of is just as unknown. This project's purpose is to show the inside of a computer in an up-close and personal form. With the aide of a scanning electron microscope, images of the distinct parts that make up a computer, particularly the BIOS chip and the processor, can be analyzed in great detail. These images will show the different components that make these crucial parts of the computer and how the materials and arrangement of the micro-components affect the computer. Also to be discussed are the materials themselves.

REGULATION OF NOVEL VIRULENCE GENES BY HRPL IN ERWINIA AMYLOVORA
David Ottarson
Location: Ballroom, 1:30 PM - 3:30 PM
Category: Microbiology, Immunology, and Infectious Disease-Section 4, Poster
Mentor(s): George Sundin (Plant Pathology)
Erwinia amylovora is the causal agent of fire blight, a devastating disease of rosaceous plants, most importantly of apple. E. amylovora expresses a type III secretion system (T3SS) that is required for pathogenicity, and is regulated by the transcription factor HrpL. DNA microarray analysis has shown that a number of genes also regulated by HrpL have unknown functions. By inactivating these novel genes, we will determine if they are involved in E. amylovora pathogenicity. Null mutants were created via the λ Red recombinase system. Mutants were inoculated into immature pears, and virulence factors were identified via changes in lesion size and pathogen population in planta. We also tested for changes in bacterial motility and exopolysaccharide production, since they are involved in the infectious process. Further experimental analysis will determine how these genes are involved with the T3SS or a broader network of regulation for virulence factors in E. amylovora. By better understanding the hrp regulon, we hope to find new methods of control for fire blight and other plant pathogenic bacteria.

TRANSPOSON MUTAGENESIS OF GEOBACTER SULFURREDUCENS
Anne Otwell
Location: Ballroom, 1:30 PM - 3:30 PM
Category: Microbiology, Immunology, and Infectious Disease-Section 4, Poster
Mentor(s): Gemma Reguera (Microbiology and Molecular Genetics)
Geobacter sulfurreducens has the capability to fully oxidize organic compounds using an assortment of metals as electron acceptors. This ability has been harnessed for the bioremediation of toxic and radioactive metals including uranium. G. sulfurreducens is able to precipitate uranium out of ground water by reducing soluble uranium(VI) to its insoluble form, uranium(IV). Important to this process are conductive pili nanowires. Previous studies in our lab have shown that nanowires play a vital role in precipitating uranium, as well as in biofilm development. In addition, biofilms exhibit a greater tolerance to uranium toxicity, as well as a greater ability to immobilize and reduce uranium. In order to better understand both biofilm formation and uranium reduction in G. sulfurreducens, a transposon mutagenesis system is being utilized. A biofilm screening is then performed on all mutants, identifying both biofilm deficient and superbiofilm forming mutants. Once mutants are selected, the interrupted gene is identified using a rescue cloning method. So far, the library consists of 4,000 mutants, of which all have been screened. The transposon mutagenesis system has been optimized, and genes have been identified including a pili-biogenesis gene, PilC. The completion of a 15,000 member mutant library will allow us to identify genes involved in biofilm formation and pili function, which will provide important insight into the physiological basis of subsurface bioremediation. Better understanding the mechanism of uranium reduction will allow us to improve the facilitation of bioremediation techniques.

RELATIONSHIP BETWEEN MOLECULAR MECHANISM AND MODE OF INHERITANCE
Loren Palmeri
Location: Gold Room, 9:30 AM - 11:30 AM
Category: Cell Biology, Genetics, and Genomics-Section 1, Poster
Mentor(s): Patrick Venta (Microbiology and Molecular Genetics)
The relationship between modes of inheritance and molecular modes of action is partly understood. However, no concrete classification scheme exists that will allow researchers to find general patterns among various molecular mechanisms that underlie inheritance. One potential scheme that may help establish the relationship between inheritance and action is to first classify genes according to a quantitative

scale (non-essential, haplosufficient, haploinsufficient) and then further classify them qualitatively. Using this scheme, we have developed the hypothesis that most genes that show both recessive and dominant inheritance patterns are quantitatively haplosufficient and that the dominant mode is due to gain-of-function mutations that have adverse effects on normal molecular activity. This hypothesis is based on the concept that most genes have a built in "safety margin"; they produce more protein than is necessary in a non-stressful environment. Using prior research we developed data supporting this hypothesis for a set of genes tabulated by Andrew Wilkie in 2005. For 72% of genes in his table, the dominant mode of inheritance was caused by gain-of-function mutations, 82% of which had dominant-negative effects. Interestingly, there are many haplosufficient genes in the mouse that appear to be haploinsufficient in the human. One evolutionary hypothesis is that since mice have a greater effective population size they are better able to build in safety margins over time. Ultimately, this quantitative classification of genes will allow researchers to more closely examine links between molecular mechanism and mode of inheritance.

GENETIC MAPPING OF THE GREEN-STRIPE LOCUS
Priyanka Pandey
Location: Parlor A, 9:30 AM
Category: Agriculture and Animal Science, Oral
Mentor(s): Cornelius Barry (Horticulture)
Color is a key determinant of fruit quality and color variants in horticultural crops can attract premiums. The green-stripe (gs) mutant specifically alters fruit color in the skin of tomato fruits. Developing gs fruits are characterized by irregular longitudinal dark green stripes on the epidermis that eventually turn golden during ripening resulting in ripe fruits that are bi-colored. The gs mutation has been incorporated into several tomato cultivars including the heirloom varieties Green Zebra and Tigerella. The physiological and molecular basis of the gs mutation is unknown but classical linkage mapping has placed the gs locus on long arm of chromosome 7. As a starting point to isolating the gs locus, an interspecific F2 population segregating for the gs mutant allele was generated from a cross between S. lycopersicum (gs/gs) X S. pimpinellifolium (GS/GS). Initially, linkage to a 2 cM interval on chromosome 7 was established using a population of 160 F2 individuals. The map position was further refined to a 160 kb interval utilizing a population of 759 F2 individuals and newly available tomato genome resources. This 160 kb interval contains 12 predicted genes. Progress on identifying a candidate gene for the gs locus will be presented.

EXCLUSION ANALYSIS OF CANDIDATE GENES HYPOTHESIZED TO UNDERLIE DOBERMAN PINSCHER DILATED CARDIOMYOPATHY
Rachel Parent
Location: Gold Room, 9:30 AM - 11:30 AM
Category: Cell Biology, Genetics, and Genomics-Section 1, Poster
Mentor(s): Patrick Venta (Microbiology and Molecular Genetics)
Dilated Cardiomyopathy (DCM) is a type of heart disease that leads to congestive heart failure. It is believed that between 10%-50% of Doberman Pinschers die from DCM but we do not currently know which gene causes the disease. DCM in Dobermans is late in onset, generally seen between ages five and eight. With dogs often producing many generations before being affected, they often pass on the causative gene to many of their offspring before they are known to carry it. In order to eradicate the disease from the population, the causative gene must be found in order to produce a genetic test that can be used before a dog is used for breeding. We are utilizing exclusion analysis to test genes that are already known to cause DCM in humans.

NAMES FOR LIFE SEMANTIC RESOLUTION SERVICES FOR THE LIFE SCIENCES
Charles Parker
Location: Ballroom, 1:30 PM - 3:30 PM
Category: Microbiology, Immunology, and Infectious Disease-Section 3, Poster
Mentor(s): George Garrity (Microbiology and Molecular Genetics)
Within the Genomes-to-Life Roadmap, the DOE states that a significant barrier to effective communication in the life sciences is a lack of standardized semantics that accurately describe data objects and persistently express knowledge change over time. As research methods and biological concepts evolve, certainty about correct interpretation of prior data and published results decreases because both become overloaded with synonymous and polysemous terms. Ambiguity in rapidly evolving terminology is a common and chronic problem in science and technology. N4L is a novel technology designed to solve this problem.

MSU'S URBAN TREE CARBON SEQUESTRATION OFFSETS
Lisa Parker
Location: Ballroom, 1:30 PM - 3:30 PM
Category: Agriculture and Animal Science, Poster
Mentor(s): David MacFarlane (Forestry)
Michigan State University (MSU) holds voluntary membership in the Chicago Climate Exchange (CCX). This has necessitated a detailed analysis of the university's carbon footprint and the potential for reduction of carbon emissions. Here, research is presented which contributes to this effort through quantification of carbon sequestered in MSU-owned lands and forests. Two phases of the project are discussed: The first phase of research was the expansion of the annual carbon sequestration formulas to include the vast diversity of woody plant species found on the campus; currently the CCX's urban tree carbon offset protocols provide for only 100 common tree species, while the MSU campus contains over 2,300 plant species. This highlights a general problem in plant carbon sequestration estimation: that many more species are sequestering carbon than have been studied. The second phase involved estimation of the potential magnitude of annual offsets to MSU power plant emissions provided by the campus plantings, with consideration of the CCX's eligibility requirements and carbon offset accounting rules. This research culminated in the acceptance by the CCX of MSU's proposed protocol revisions titled "Carbon Emission Offsets from Urban Forests at Michigan State University", thus establishing us as "the first CCX urban forestry project to be validated."

GEOGRAPHIC RACIAL EQUALITY BETWEEN ASIANS AND WHITES IN RAMSEY COUNTY, MINNESOTA
Sara Parten
Location: Gold Room, 9:30 AM - 11:30 AM
Category: Social Science: General-Section 1, Poster
Mentor(s): Joseph Darden (Geography)
This paper examines the extent of Asian geographic racial equality in Ramsey County, Minnesota. Geographic racial equality refers to Asians reaching equal levels to Whites in educational attainment, occupational status, and median household income while maintaining low levels of residential segregation. I hypothesize that at least 4 of the 17 municipalities in Ramsey County, Minnesota would be areas of geographic racial equality. The data was obtained from the 2000 U.S. Census Summary File 4, and is measured at the municipal level. The difference in median household income was done by merely subtracting the Asian median household income from the White median household income. The difference in the percent of Asians and Whites aged 25 and older with a bachelor's degree or higher was also compared along with the difference between the percent of the population of Asians and Whites age 16 and older with a managerial or professional occupation. The level of residential segregation was determined by computing an index of dissimilarity by census tract. When all the municipalities were compared, the results show that Asians have attained geographic racial equality with Whites in over 20% of the municipalities in Ramsey County. Thus the hypothesis is accepted. The percent of all Asians living in areas of geographic racial equality in Ramsey County is 8.6%, while the percent of all Whites living in areas of geographic racial equality in Ramsey County is 20.9%.

BIOSYNTHEIS OF GOLD GLYCONANOPARTICLES (AUGLYNP) USING A GREEN CHEMISTRY APPROACH
Ryan Pawloski
Location: Gold Room, 1:30 PM - 3:30 PM
Category: Engineering, Computer Sci, and Math-Section 2, Poster
Mentor(s): Evangelyn Alocilja (Biosystems Engineering), Edith Torres-Chavola (Biosystems Engineering)
Glyconanoparticles are an innovative area of study that has just recently emerged. These carbohydrate-coated particles are useful in areas ranging from the study of carbohydrate-protein interaction, biosensors, cell imaging, and drug delivery. The main drawback to the use of these particles, however, is the labor and time intensive nature of their synthesis. Using the most current methods of chemical synthesis, gold nanoparticles must first be synthesized via a sodium-citrate reduction, and then use a second chemical step to enable carbohydrate capping. Overall, this method contains several toxic chemical reagents and bi-products, all of which required special protocols for handling and disposal in order to avoid environment contamination. The main goal of the present research project is to develop a “greener” alternative to biosynthesize glyconanoparticles in one single step using different carbohydrates. Three main experimental variables in the reaction (pH, temperature and carbohydrate concentration) were optimized. Optimal synthesis conditions for particle size and monodispersity were determined. The obtained biogenic glyconanoparticles can potentially be used for nanodiagnostics and nanomedicine applications

CHARLES HENRY STOKES
Cameron Paxton
Location: Lake Erie Room, 11:45 AM
Category: Social Science: General-Section 1, Oral
Mentor(s): Benjamin Smith (History)
Imperialism has long been defined as the subjugation of lands by a home country. This implies that a hostile force must be present in order to “help the natives improve their lives” put more simply, this means to destroy their native structure of life and enslave their people. However, in areas were there was not a strong military presence another form of Imperialism is needed. A go between, someone who can work with the natives with in their system yet gain material wealth for the colonizing country. In Eastern Africa, this was Charles Henry Stokes. He first came to Africa as a missionary for the Church Missionary Society, then for the Germans, and eventually working simply for himself. All the while improving his trade connections, and after leaving the CMS (Church Missionary Society) he began trading in Ivory and other goods, leading caravans from the coast at Zanzibar inland. Eventually going even so far as the Belgian Congo, amassing money as his caravan moved back and forth across the continent. All of his relations with the natives keeping him safe at this time, even going so far as to marry a native. Conclusively pointing to his ability to transcend the boundaries of imperialism at the time.

MODELING THE BIRD POPULATIONS
Amanda Pham, Quinn Foley, Matthew Herman, Franklin Luchini, Katelyn Prieskorn
Location: Ballroom, 1:30 PM - 3:30 PM
Category: Environmental and Natural Resources-Section 2, Poster
Mentor(s): Igor Nazarov (Mathematics)
We would like to present a project demonstrating effects of different factors on dynamics of the bird populations. Mathematical modeling of various phenomena, such as human impact on bird populations as well as the impact of the birds on humans, seasonal migration are the primary focus in this poster.

PROOF IS IN THE EYE OF THE BEHOLDER: MIDDLE SCHOOL STUDENTS' CONCEPTIONS OF MATHEMATICAL PROOF
Andrew Picard, Justin Drwencke
Location: Gold Room, 9:30 AM - 11:30 AM
Category: Education-Section 1, Poster
Mentor(s): Kristen Bieda (Teacher Education)
Students' preparation to study mathematical proof is becoming more important as reasoning and proving continue to receive attention in initiatives to reform school mathematics. Although instruction in formal proof typically begins in the high school geometry course, students can develop a conceptual foundation needed to understand and generate mathematical proof by arguing the logical implications of arguments and justifications as early as the elementary grade levels. This poster presents findings from a study examining middle grades students' evaluations of justifications from interview responses to tasks in both number theory and geometry. During the interview, reviewed a statement to be true

and evaluated two justifications, one proof and one non-proof, for each task. Data analysis determined the frequency that students chose a justification as more convincing than the other justification for each task, as well as the reasons students provided to explain their choice. The results show that students tended to choose a non-proof argument as more convincing for the number theory task than for the geometry task. Analyses of students' explanations for the choices they made indicated that students view examples as an acceptable way of proving something is true for number theory statements, while examples may not be as convincing when proving something true in geometry. Implications for the use of proof evaluation tasks to develop students' abilities to reason and prove are discussed.

ELECTROPORATION OF LINEAR DNA IN CHICKEN
Tasneem Pierce
Location: Gold Room, 1:30 PM - 3:30 PM
Category: Cell Biology, Genetics, and Genomics-Section 3, Poster
Mentor(s): Titus Brown (CSE/MMG)
Fox d3 marks premigratory and migrating neural crest cells in chickens. If the neural crest cells are sequenced, the genes functioning at that time could be discovered as well as their enhancers. In order to find the neural crest cells, we electroporated to find the cells that express Fox d3. PCR was then used to manipulate the DNA used in electroporation, making linear DNA constructs. These linear DNA constructs with a Fox d3 promoter failed to express green florescent protein in the same areas as the plasmid Fox d3 DNA. DNA cloning can be used instead to manipulate the DNA that is electroporated in the chicken embryos.

STERIC-INDUCED TOPOLOGICAL DIVERSITY IN ZINC BIS(4-PYRIDYLMETHYL)PIPERAZINE COORDINATION POLYMERS WITH SUBSTITUTED ISOPHTHALATE LIGANDS
Amy Pochodylo
Location: Ballroom, 9:30 AM - 11:30 AM
Category: Physical Sciences, Poster
Mentor(s): Robert LaDuca (Lyman Briggs/Chemistry)
The structures of divalent zinc coordination polymers containing a 5-substituted isophthalate ligand and the long-spanning hydrogen-bonding capable tethering ligand bis(4-pyridylmethyl)piperazine (bpmp) depend greatly on the steric hindrance imparted by the substituent. $\{[Zn(NO2ip)(Hbpmp)][ZnCl(H2O)(NO2ip)]\}_n$ (1, NO2ip = 5- nitroisophthalate) possesses parallel two-fold interpenetrated cationic (4,4) coordination polymer grids and anionic one-dimensional (1-D) chain motifs. The chloride-free derivative $\{[Zn5(NO2ip)6(Hbpmp)2(bpmp)]\bullet 2H2O\}_n$ (2) manifests trinuclear {Zn3} units linked into a complex doubly interpenetrated 4,8-connected binodal 3-D lattice with $\{(4^5 6)_2(4^{14}6^{16})\}$ topology. $\{[Zn(OHip)(bpmp)]\bullet H2O\}_n$ (3, OHip = 5-hydroxyisophthalate) has a five-fold interpenetrated diamondoid topology with a self-penetrated supramolecular lattice, $[Zn2(tBuip)2(bpmp)]_n$ (4, tBuip = 5-tert-butylisophthalate) shows a two-fold interpenetrated primitive cubic net based on {Zn2} dimeric units, and $\{[Zn(OMeip)(bpmp)]\bullet 8H2O\}_n$ (5, OMeip = 5-methoxy-isophthalate) adopts an undulating (4,4) single-grid 2-D topology. Luminescent properties of these materials are also reported.

ESTRADIOL BINDING TO INSULIN AND INSULIN RESISTANCE MAY EXPLAIN INSULIN RESISTANCE IN HYPERESTROGENEMIA SYNDROMES
Abigail Podufaly
Location: Ballroom, 9:30 AM - 11:30 AM
Category: Microbiology, Immunology, and Infectious Disease-Section 1, Poster
Mentor(s): Robert Root-Bernstein (Physiology)
Excess steroid hormones are associated with insulin resistance in many clinical conditions but the cause of the insulin resistance is unclear. We hypothesize that steroid hormones might bind directly to insulin and the insulin receptor interfering with insulin activity. Ultraviolet spectrophotometry was utilized to determine whether steroid hormones bound to insulin and the insulin receptor (IR). Estradiol (E₂) bound to insulin with a Kd of 4.9 x 10-9 M, a concentration well above normal concentrations of E₂, but surpassed in a variety of conditions including pregnancy, in vitro fertilization (IVF) treatment, ovarian hyperstimulation syndrome (OHSS), estrogen therapy treatments for post-menopausal women, and people undergoing sex changes, all of which are associated with insulin resistance. Estradiol also bound to various peptides derived from the IR that are associated with insulin binding. Insulin conjugated to horse radish peroxidase was used to determine the effect of estradiol on insulin binding to the IR. Estradiol decreased insulin binding to its receptor 5.12-fold when E₂ was bound to both the IR and insulin. The impact of decreased insulin binding to the IR and estrogen-estrogen receptor binding would be decreased negative feedback regulation of these hormones resulting in higher levels of the production or secretion of both hormones, resulting in a vicious cycle of interference.

SICKLE-CELL: CURE OR DISEASE?
Jason Portis
Location: Gold Room, 9:30 AM - 11:30 AM
Category: Cell Biology, Genetics, and Genomics-Section 1, Poster
Mentor(s): Carl Boehlert (Chemical and Material Science Engineering)
Sickle-cell anemia is a genetic disease that is present in 300,000 new babies every year. The main effect of this disease is to distort the shape red blood cells to the point where they do not easily bind with oxygen. An important question about sickle-cell, as with every genetic disease, is how did evolution favor those with such a trait to the point where it reaches a high prevalence? The fact that a higher number of sickle-cell cases around the Mediterranean and Sahara regions reveals that something in that region causes a higher survival rate for carriers of the Sickle-Cell gene. This proves to be true as sickle-cell carriers are virtually immune to Malaria, a disease with a high fatality rate in the Sahara region. This causes us to consider what sickle-cell Anemia is, a cure or a disease?

EFFECTS OF CONDITIONER ON HAIR CUTICLE MORPHOLOGY
Nicole Pytel
Location: Gold Room, 1:30 PM - 3:30 PM
Category: Cell Biology, Genetics, and Genomics-Section 3, Poster
Mentor(s): Carl Boehlert (Chemical Engineering and Materials Science)
The hair care industry markets a wide variety of hair conditioners supposedly designed to achieve specific results such as greater moisture, greater volume or decreased tendency of hair to tangle (manageability). However, hair at the shaft is non-living and therefore chemically inert. In truth, conditioners simply coat hair in order to smooth the cuticle of the shaft; they cannot penetrate the hair or reconstruct the hair's internal fiber structure. Claims of a specific effect of a conditioner are based on whether the conditioner coats hair with essential fatty acids (EFAs), coats hair with protein, or acidifies the hair. Using an environmental scanning electron microscope (ESEM), I will observe the effects of each of the three fundamental types of conditioners on the morphology of the hair cuticle in order to determine the extent to which their differentiated purposes provide unique effects. Samples of hair will be exposed to each conditioner once according to their respective directions and then observed from multiple angles under the ESEM.

OPTIMAL FORAGING IN ESCHERICHIA COLI
Ryan Quick
Location: Ballroom, 1:30 PM - 3:30 PM
Category: Microbiology, Immunology, and Infectious Disease-Section 3, Poster
Mentor(s): Richard Lenski (MMG)
Escherichia coli has evolved complex networks for regulation of its metabolic genes. Presumably, these networks arose through natural selection for specialized gene regulation; however, sometimes the regulation seems non-adaptive. For instance, one may expect that E. coli would consume all available resources, or the most abundant resources; however this is not the case. Instead, E. coli will often only express genes to metabolize a single resource, such as glucose, even if there are other, more abundant sugars around. This regulatory strategy appears to have evolved to maximize individual cell growth-rates by only consuming high value foods (glucose) at the cost of long-term population growth. This ecological explanation is often suggested to explain why such networks have evolved, however never tested. I will present results testing predictions for how E. coli should select different sugars to maximize their growth rates. These predictions are interpretations of a classic ecological theory; Optimal Foraging Theory. I have found strong support for this theory; when E. coli is given a choice, it always consumes the resource that maximizes its growth. Once that resource is consumed E. coli switches to the next most profitable resource. I will also present work I have done while observing these gene networks evolve in real time in the lab. Altogether this project is the first step in testing the role competition plays in shaping metabolic gene regulatory systems.

IS THERE A MUNICIPALITY OF GEOGRAPHIC RACIAL EQUALITY BETWEEN WHITES AND AMERICAN INDIANS IN YAKIMA COUNTY, WASHINGTON?
Elizabeth Raczkowski
Location: Gold Room, 9:30 AM - 11:30 AM
Category: Social Science: General-Section 1, Poster
Mentor(s): Joe Darden (Geography)
The research question was to determine whether there was geographic racial equality between Whites and American Indians in Yakima County, Washington. I hypothesized that there would be at least one area of geographic racial equality in Yakima County, Washington, but that no more than 25% of the municipalities within the county would qualify. The data was obtained from the 2000 United States Bureau of Census, Summary File 4 (SF4) and Summary File 1 (SF1). To compare the status of American Indians and Whites in relation to median household income, educational attainment, and occupational status, a simple ratio was used to compare the median incomes and the percentage of bachelor degrees and professional status occupations held by each group. In order to measure the degree of residential segregation between the two groups, an index of dissimilarity was calculated using block groups, a subdivision of census tracts. Low levels of residential segregation were indicated by a score of less than 50. One municipality in Yakima County qualified as a place of geographic racial equality. The ratios for educational attainment, occupational status, and median income all favored Native Americans. In addition, the index of dissimilarity was 30.5. The hypothesis was accepted. There was one place of geographic racial equality in Yakima County and this single place accounts for less than 25% of the county's municipalities. Only 3.5% of American Indians and just .82% of Whites in Yakima County live in a place of geographic racial equality.

MSU IS BEING SPARTAN GREEN
Adam Rademacher
Location: Green Room, 2:00 PM
Category: Digital Media-Section 2, Oral
Mentor(s): Amol Pavangadkar (Telecommunications)
The Be Spartan Green campaign at MSU talks the talk of being environmentally responsible, but what does it actually do? We sat down with key members of the green initiatives on campus from Physical Plant, the Office for Campus Sustainability, and the Be Spartan Green campaign to ask them how responsible MSU really is. Then we compiled a series of short-length general interest television spots to air on WKAR and feature prominently on the official Be Spartan Green website. Topics include Hybrid Vehicle use on campus, efforts to reduce energy consumption by older buildings on campus, planting trees, and fair trade coffee.

MOUNT OLYMPUS

Adam Rademacher, Daniel Alexander II, Marie Lazar, Adam Starks

Location: Green Room, 11:15 AM

Category: Digital Media-Section 1, Oral

Mentor(s): Brian Winn (Telecom, Information Studies and Media)

Mount Olympus is an attempt to breach the walls between "serious" games and "entertainment" games, by merging what is typically considered an exercise game and an entertaining action-adventure game set in ancient Greece and rich in Greek Mythology. The game uses a wii-mote and dance pad to track body motion which translates to in-game character movement. By using these inputs and creating a rich and engaging experience, we hope to invoke enough interest in the player that they do not realize they are exercising--what we refer to as "stealth" exercising. The goal of this game is to study the effectiveness of "stealth" exercising for inactive college-aged players, and ultimately, it will be used in connection with a study to determine the viability of using the entertainment present in games to create incentives to exercise for people who live a more sedentary lifestyle.

CHARACTERIZATION OF A NOVEL MUTATION IN THE RPS5 GENE OF SYNECHOCYTIS SP PCC6803

Kevin Raehtz

Location: Ballroom, 9:30 AM - 11:30 AM

Category: Microbiology, Immunology, and Infectious Disease-Section 2, Poster

Mentor(s): Barbara Sears (Plant Biology)

Modern cyanobacteria and chloroplasts exhibit many orthologous characteristics, as chloroplasts are the descendents of cyanobacteria that formed an endosymbiotic relationship with eukaryotic cells billions of years ago. In particular, chloroplasts ribosomal proteins have been highly conserved, to the point that they are vulnerable to the action of some antibiotics that normally target bacterial ribosomes. One such antibiotic is spectinomycin, which binds to the 30S subunit of the ribosome, inhibiting protein synthesis. We have discovered a novel mutation conferring resistance to spectinomycin in a gene of the freshwater cyanobacterium Synechocytis sp PCC6803. This gene, rps5, encodes a protein domain (ribosomal protein S5) that is orthologous to a domain in chloroplast ribosomes. By characterizing this mutation in Synechocytis, we hope to gain a better understanding of spectinomycin resistance in the chloroplast. The novel mutation was identified by sequencing a region of the rps5 genes from three related spectinomycin-resistant lines of Synechocystis. We chose this region for examination because it is often the site of resistance mutations in E. coli. We discovered that all three Synechocytis lines exhibited an identical missense mutation. We hypothesize that this missense mutation alters the interaction of spectinomycin with the S5 protein, conferring resistance. To investigate this hypothesis, we are currently trying to isolate independent spectinomycin-resistant lines of Synechocytsis. The new mutants will be examined to determine if they exhibit the same missense mutation or other mutations that confer resistance to spectinomycin.

DOES NON-SPEECH TONAL CONTEXT AFFECT WORD SEGMENTATION?

Prashanth Rajarajan, Krista Bur

Location: Ballroom, 1:30 PM - 3:30 PM

Category: Psychology-Section 3, Poster

Mentor(s): Laura Dilley (Communicative Sciences and Disorders), Devin McAuley (Psychology)

Previous research has shown that pitch and rhythmic characteristics of speech syllables in initial portions of spoken word lists (a speech precursor) influence how listeners perceptually segment subsequent lexically ambiguous syllables into words (e.g., note bookworm, notebook worm) by affecting the rate with which participants heard a disyllabic final word (e.g., bookworm), although identical acoustic material was judged. The present study extended this work by considering the effects of a non-speech precursor (i.e., a tone sequence) on segmentation of lexically ambiguous syllable sequences. Participants heard a tonal precursor consisting of a four -tone sequence (rather than a four-syllable sequence) which was followed by four speech syllables (e.g., foot note book worm). The pitch and/or rhythmic characteristics of tones in tonal precursors were manipulated to create two types of precursor context --monosyllabic and disyllabic; these were predicted to generate perception of either a monosyllabic final word (e.g., worm) or a disyllabic final word (e.g., bookworm), respectively. Participants' task was to report the final word they heard. Consistent with previous research involving variations in pitch and rhythmic characteristics of speech precursors, non-speech tonal precursors also influenced participants' judgments about the final word they heard. In disyllabic tonal contexts, participants generally reported more disyllabic final words than in monosyllabic tonal contexts. The magnitude of these effects was generally smaller than previously observed with speech precursors.

FUNCTIONALIZATION OF BIOSYNTHETIC GOLD NANOPARTICLES FOR NANODIAGNOSTICS APPLICATIONS
Romali Ranasinghe
Location: Gold Room, 1:30 PM - 3:30 PM
Category: Engineering, Computer Sci, and Math-Section 2, Poster
Mentor(s): Evangelyn Alocilja (Biosystems and Agricultural Engineering)
Nanodiagnostics is defined as the use of particles, wires and tubes on the scale of 10-9 m, in molecular diagnostics. A large variety of technologies are being researched that exploit the unusual optical, electrical and electrochemical properties that arise from the size and structure of nanomaterials. Current research in biomedical technology includes the use of nanomaterials in cancer detection, clinical lab diagnostics, and detection of microbial pathogens and bioterrorism agents. Gold nanoparticles in the 20-60nm range are of particular interest when coupled to biological molecules such as DNA, antibodies and carbohydrates, for their use as signal transducers in biosensors and bioprobes. When functionalized with ssDNA, gold nanoparticles have the potential to provide highly improved sensitivity and specificity in detecting complementary DNA and RNA sequences. At present, gold nanoparticles are synthesized using chemical methods. However, these methods are cost-restrictive, and have negative environmental impacts. In an effort to produce sustainable, non-toxic gold nanoparticles, a 'Green' synthesis method was developed, using carbohydrates. The obtained AuNPs were then functionalized with DNA-probes, successfully creating a transducer-system for DNA-based nano-biosensor platforms.

DEVELOPMENT OF A CULTURALLY RELEVANT CURRICULUM FOR AMERICAN INDIAN HEAD START PROGRAMS IN MICHIGAN
Linda Rau, Mallory Gignac
Location: Gold Room, 1:30 PM - 3:30 PM
Category: Education-Section 2, Poster
Mentor(s): Hope Gerde (Family and Child Ecology)
Children of the American Indian Head Start programs of Michigan are at risk for school failure due to low socio-economic status, low teacher education, and poor educational environments (GAO, 2003). For example, these children scored significantly lower than the national Head Start average in cognitive, language and social skills (Barnes, Belleau, Farrell, & Fitzgerald, 2009). One hypothesis for narrowing the achievement gap for these children is to develop a culturally relevant curriculum; to support children's positive identity as Indian, engage children in cognitive and social development through culturally relevant content, and establish clear home-school connections. Also, using a research-based curriculum supports teachers with limited education. A focus group, using Kreuger's methodology (1998), was conducted with eight American Indian language and cultural experts. This work yielded data identifying valuable cultural content for young Indian children. Throughout the focus group session we used member checking to make sure no meaning was lost from the participants' discussion. Then our team analyzed the focus group data using text analysis (Ryan & Bernard, 2000), creating a thematic inventory of key cultural concepts. Results indicated that there was a common group of cultural themes for which experts thought young children should know. We expanded and triangulated these data with additional information from other texts (many written by American Indian writers), Internet sites (from tribes and others), and team discussions. This scientifically rigorous method was successful in securing the necessary content and process information to develop a culturally and developmentally appropriate curriculum for American Indian children.

TOOLS FOR THINKING IN TEXTBOOKS
Meghan Raycraft, Megan Courtley, Meghan Miotto, Amber Peruski
Location: Gold Room, 1:30 PM - 3:30 PM
Category: Education-Section 2, Poster
Mentor(s): Michele Root-Bernstein (Theatre)
Professors Root-Bernstein propose that creative scientists use thirteen "thinking tools": observing, imaging, abstracting, pattern recognition, pattern forming, analogizing, body thinking, empathizing, dimensional thinking, modeling, playing, transforming, and synthesizing. But Professors Lownds and Poff find few of these "thinking tools" in science textbooks. The focus of this presentation is four of these tools: observing, imaging, abstracting, and pattern recognition. Science textbooks used in third, fourth, fifth, seventh, and tenth grades were read by the group and analyzed by consensus evaluation for use of these "thinking tools in text, illustrations, captions, exercises and activities, problem sets, and indexes. Total instances of each tool in each category was compiled and compared. A weighted value for each "tool" was produced according to the number of categories a tool appeared in. The data were also adjusted by dividing the number of uses of each tool (or its weighted value) by the number of pages evaluated. Unlike most of the other thinking tools, these four were more prevalent across all textbooks; however, they were still found more heavily in books targeted towards younger students.

GIGANTEA ISSUES IN ARABIDOPSIS: DEFECTS IN STARCH ACCUMULATION AND CIRCADIAN RHYTHM
Jesica Reemmer
Location: Gold Room, 1:30 PM - 3:30 PM
Category: Biochemistry and Molecular Biology-Section 2, Poster
Mentor(s): Eva Farre (Plant Biology)
Mutations of the Gigantea (GI)gene are known to have a number of novel effects on Arabidopsis plants, including excess starch accumulation, late floral initiation, and disruptions in normal circadian rhythms. However, the biochemical interactions that bring about these changes are not well defined. My research is focused on observing the differences in phenotype of several different GI alleles with the intent of determining which steps in the starch and circadian clock pathways have affected regulation. This is a particularly intriguing question as a more complete understanding of the players in the circadian clock pathway could allow for more effective manipulations of carbohydrate compositions and timing of maturation in agricultural plants. In order to describe the GI mutants, I conducted an extraction and absorption assay to determine differences in starch accumulation levels. I also performed another absorption assay that employed a series of enzymatic reactions to ascertain the composition of leaf sugars. Circadian rhythm pattern alterations were observed by using time-lapse photography to track the cotyledon movements of seedlings. Delays in flowering time will be determined by counting the rosette leaves of mature plants. I anticipate that the combination of these experiments will provide insight into the structure and operation of the circadian pathways present in plants.

THE INVISIBLE REFUGEES: A HISTORY OF THE MESKHETIAN TURKS AND THEIR GROUP IDENTITY
Bailey Reidinger
Location: Lake Superior Room, 10:15 AM
Category: Social Science: General-Section 3, Oral
Mentor(s): Laura Delind (Anthropology)
The problem my research addresses is one of identity. Specifically, it explores the development and maintenance of a refugee's identity, who have had most of their lives stripped away from them. To understand this problem, it is essential that we consider all of the factors that contribute to and complicate a people's identity. I am particularly interested in the formation of a new group identity, especially where one did not exist prior to the deportation or exodus from the area. My research therefore focuses on the Meskhetian Turks, who are one of the many groups deported from Georgia in 1944 by Stalin. To date, they are still one of the only ethnic groups not allowed to return to Georgia. They have been forced out of several secondary locations, including Azerbaijan and Uzbekistan, and several family groups have moved as far as the United States. It is therefore very interesting that they have managed to keep a cultural identity throughout political hardships and over such a broad span of time and distance. In my presentation, I will present the obstacles faced by refugees as a whole and the Meskhetian Turks in particular, as well as the identity developed by the Meskhetian Turks during their exile. I will also explore their different adaptation techniques and how those techniques affected their interactions with their new communities. The conclusions drawn from this research may have widespread implications for understanding refugees and their identities, as well as how best to serve them.

A FOCUS GROUP STUDY INVOLVING MOTHERS TO DEVELOP EFFECTIVE MESSAGES FOR BREAST CANCER RISK REDUCTION AMONG PRE-ADOLESCENT AND ADOLESCENT GIRLS
Allison Repp, Greg Hall
Location: Ballroom, 9:30 AM - 11:30 AM
Category: Communication Arts and Sciences, Poster
Mentor(s): Kami Silk (Health Communications)
Researchers from the The Breast Cancer and the Environment Research Centers (BCERC) have been investigating environmental risk factors that can contribute to young girls' risk for developing breast cancer later in life. The Community Outreach and Translation Core (COTC) of the BCERC has developed a series of messages targeting mothers with daughters. These messages suggest preventative measures, such as maintaining a health body weight and limiting exposures to certain chemicals (BPA and PFOA), as strategies to reduce breast cancer risk later in life. For this project, focus groups comprised of female participants with young daughters (N=47), were conducted to assess the effectiveness and understanding of initial drafts of the breast cancer risk reduction messages. The goal of this study is to utilize the information gathered from the focus groups to create new, more effective and understandable messages targeted to mothers to protect their daughters from possible breast cancer risk factors.

IMMIGRANT COMMUNITY CONTRIBUTIONS THROUGH THE LENS OF IMMIGRANT GARDENING IN THE LANSING AREA
Rebecca Richart
Location: Lake Superior Room, 9:45 AM
Category: Social Science: General-Section 3, Oral
Mentor(s): Laura Delind (Anthropology)
Traditionally, the idea of progress in the United States has been based on infrastructure and concrete economic development, however, a recent trend has emerged, which focuses on culture and new connections as a measure of progress. In alliance with this new direction, communities have begun to have an increasing focus on the arts, urban gardening, cultural connections and community. My objective is to explore the role of refugees within this context, specifically through the lens of refugee gardening. Due to the new paradigm of progress, refugee gardening has been on the rise with the refugees themselves playing a critical role in the development of community assets. I have interviewed refugees and those involved in refugee gardening projects, visited gardens, and examined pro and con arguments for the integration of refugees in American communities. Through this research I have found that refugees significantly contribute to the community, especially considering the new tendencies of progress measurement. I have also sought to disprove traditional anti-refugee arguments which devalue the significance of refugee's contributions to the society in which they live.

EFFECT OF PULSED INJECTION PROCEDURES ON THE ANALYSIS OF GASOLINE USING GAS CHROMATOGRAPHY-MASS SPECTROMETRY AND CHEMOMETRIC PROCEDURES
Emily Riddell
Location: Ballroom, 9:30 AM - 11:30 AM
Category: Physical Sciences, Poster
Mentor(s): Ruth Smith (Forensic Chemistry)
The purpose of this research is to understand the importance of a pulsed pressure injection on the precision of gas chromatography-mass spectrometry (GC-MS) data and the effect on subsequent chemometric procedures used in data analysis. Gasoline will be used as an example to illustrate these effects. Optimizing injection parameters is essential to minimize non-chemical sources of variation prior to applying chemometric procedures. For optimization studies, a standard mixture of five alkanes was prepared and analyzed by GC-MS with an automatic liquid sampler (ALS), using an oven temperature program available in the literature. The optimal pulsed pressure method was chosen based on the combination that offered the lowest relative standard deviations. The alkane standard was then analyzed using the optimal pulsed pressure injection and the non-optimized injection. Relative standard deviations of the alkane components based on peak height, peak area, and retention time were compared among all combinations of injection parameters to determine the optimal injection mode. To demonstrate the effect of injection mode on principal component analysis (PCA), five gasoline samples were collected and analyzed using both the optimal pulsed pressure injection as well as an unpulsed injection. Principal components analysis was then applied to the entire data set to assess the effect of injection mode on the precision of the analysis which has consequences for the association of replicates and discrimination of different gasoline samples. Results of these studies will be presented and discussed along with the implications for forensic analyses using chromatographic data and chemometric procedures.

POTENTIAL INVOLVEMENT OF ARABIDOPSIS UPF2 IN REGULATION OF FLOWERING TIMING
I Rin
Location: Gold Room, 9:30 AM - 11:30 AM
Category: Cell Biology, Genetics, and Genomics-Section 1, Poster
Mentor(s): Steven Vannocker (Horticulture)
For many plants, flowering is strongly influenced by seasonal environmental cues superimposed on an endogenous developmental mechanism. Vernalization is the process by which exposure to a long period of cold establishes the ability to flower. In the plant Arabidopsis thaliana, the FLOWERING LOCUS C (FLC) gene acts as a strong flowering repressor. Stable repression of FLC associated with prolonged growth in the cold is a major mechanism of vernalization, and involves an epigenetic mechanism. We previously identified several genes required to maintain FLC expression in the absence of cold, and that when dysfunctional, result in cold-independent flowering. We subjected a mutant for one of these genes, VIP4, to a suppressor screening to identify mutations that would restore normal flowering. A mutation called svp4 was identified, which mapped to a small region of chromosome II containing a gene homologous to the nonsense-mediated decay (NMD) gene UPF2. A mutation was identified within the transcribed region of this gene that would cause abnormal splicing and premature translation termination. The objective of this project is to evaluate the hypothesis that the UPF2 mutation is responsible for the svp4 phenotype. This was addressed through two approaches: (1)Evaluating the ability of transgenic suppression of UPF2 to phenocopy the svp4 phenotype and (2)Evaluating the ability of a wild-type copy of UPF2 to complement the svp4 mutation.

SPATIAL AND TEMPORAL ACCUMULATION RECORD OF POLYCYCLIC AROMATIC HYDROCARBON LOADINGS IN THE UPPER GREAT LAKES REGION
Amanda Robinson
Location: Parlor C, 10:45 AM
Category: Environmental and Natural Resources, Oral
Mentor(s): David Long (Geological Sciences)
The sediment record of PAH accumulation in Lake Michigan have been interpreted to indicate production of PAHs in the Chicago-Gary industrial complex, atmospheric deposition, and within lake mixing that tends to homogenize the south to north record of PAH loadings. Underlying this observation is the hypothesis of a south to north depositional gradient for PAHs. Sediments from several inland lakes throughout Michigan were analyzed for PAHs and ²¹⁰Pb to obtain both inventories and accumulation rates of PAHs over time. The accumulation rates and inventories of the PAHs were corrected to determine the aerial accumulation of each watershed, and the Upper Great Lakes Region as a whole. The corrected inventories in fact show a depositional gradient trend decreasing from the industrious south to the north. The correlating dates of initial appearance of PAHs also follow this hypothesized gradient trend. This suggests northern migration of PAH onset over the Upper Great Lakes Region that is more influenced by the local atmosphere of each lake, rather than a steady atmospheric deposition of PAHs over the region. Accumulation rate, concentration, and peak historical date trends of PAHs do not correlate with the gradient trend, indicating local watershed influence within each lake. Unexpectedly, an inland lake is exhibiting a current increase in PAH concentration and accumulation rates, which is unknown as to why this is occurring at this time.

ENERGY EFFICIENT LAUNDRY ROOMS
Sarah Robinson, Poorni Menon, Clayton Stiffler
Location: Ballroom, 1:30 PM - 3:30 PM
Category: Environmental and Natural Resources-Section 2, Poster
Mentor(s): Steven Safferman (Biosystems and Agricultural Engineering)
Our group researched energy and water efficient laundry rooms, focusing on the washing machines. Our objective is to recommend the most practical and economically efficient washing machines for the University housing based off of the data collected. Our report will help Michigan State University to renegotiate a contract for upgraded washing machines. Our project is designed to save the University money by converting the current top-loading washing machines to front-loading machines. We will also consider making small additional changes to the laundry room as a whole including updating the dryers. We researched the most energy and water efficient washing machines and then continued to narrow down our prospects by price and availability. It was important for us to recommend purchase from a distributor that would stimulate the mid-Michigan economy.

VARIABILITY IN THE INPUT AND ACQUISITION OF SECOND-PERSON MORPHOLOGY IN TWO DIALECTS OF SPANISH
Carol Ross
Location: Ballroom, 1:30 PM - 3:30 PM
Category: Psychology-Section 3, Poster
Mentor(s): Cristina Schmitt (Linguistics)
Language is a very complex system, and processes that alter the pronunciation of particular forms (phonology) may have consequences for other components, such as the morphological or syntactic components. In Chilean Spanish, a lenition process weakens all syllable-final [s] to [h] or [ ]. This apparent small change has consequences not only for the acquisition of the plural morphology as seen in Miller 2007, but also for any morphology with syllable-final [s]. For example, deletion of [s] to [h] or [ ] in a 2nd-person conjugated verb comes (to eat), can be interpreted instead as come, the 3rd-person singular conjugation. The weakening causes ambiguity in the input (3rd person=2nd person), and may cause difficulty in acquiring 2nd/3rd person. Preliminary comprehension studies suggest that they do not have problems with second person as they do with plural. Does the deletion of syllable-final [s] occur more in adults in instances of plural than in 2nd person? This study examines the realization of 2nd-person in 4 Chilean children and adult dyads free speech production. We compare the rate of plural omissions with the rate of 2nd person omissions in different contexts, sentence final, and sentence non-final, to determine precisely the rate of omission and its impact on acquisition.

CHILDRENS EXPERIENCE WITH THE INTERNET AND TASK PERSISTENCE
James Rossi, Celeste Roosien
Location: Ballroom, 9:30 AM - 11:30 AM
Category: Psychology-Section 2, Poster
Mentor(s): Judith Danovitch (Psychology)
There is little research on the effect Internet use has on children, but there is evidence that Internet experience influences children's perception of how quickly and accurately information can be attained. This study examines Internet use and its relationship with task persistence in children ages 10 and 11 years. We hypothesize that children who use the internet frequently and have quick access to information (via internet search engines) may be less persistent in seeking out difficult to obtain information. To measure this, we developed two persistence tasks: a 10 questions game and a visual search game. During the 10 questions game, children are asked to guess what the experimenter is thinking of based on ambiguous clues they are given. A point incentive encourages the children to use as few clues as possible while still guessing correctly. During the visual search game, children are asked to circle as many white cowboy hats as possible in a large, complex picture. Again, there is a point incentive to finish quickly while still being accurate. Each child's performance on these tasks was compared to Lufi and Cohen's (1979) measure of self-reported persistence and to Yan's (2006) measure of Internet experience. Results showed no correlation between internet score and the persistence tasks, although the tasks were highly correlated with each other. We will discuss possible reasons for this relationship. This study raises many questions applicable to domains such as education and technology that should be addressed by future research.

WIAR EVENT HISTORY CALENDARS
Lindsay Rothwell, Katelynn Brookshire
Location: Gold Room, 1:30 PM - 3:30 PM
Category: Social Science: General-Section 3, Poster
Mentor(s): Natalie Kasiborski (Social Work), Sheryl Kubiak (Social Work)
The data used to construct these event history calendars was collected over a ten year period on pregnant, incarcerated women who took part in the Women and Infants at Risk (WIAR) project. The event history calendars simultaneously outline the mother's criminal justice recidivism path as well as the child's involvement with foster care and child protective services. The construction of the calendars provided a new way to look at the relationship and overlap between the mother's criminal justice involvement and a child's involvement in the child welfare system, individual women in the system and the circumstances that follow their incarceration. The women in the WIAR project were separated into two different groups- the experimental group received parenting classes, access to resources, and the opportunity to live in a group home where the mother could continue to care for the child after birth. The control group followed typical protocol of the prison system and their child was removed after birth. The event history calendars are intended to give a more in depth view of the lives of the mother and child in the 10 years following their birth. The poster and presentation will focus around the data that was collected with the compilation of the ten year follow up with the women who participated in the initial data collection by referencing administrative data collected during that time and the event history calendars that were created. Information collected from the Department of Human Services records, as well as judicial records, were compiled into a large database. Then the information for a small sample of the women was put into event history calendars to provide a descriptive, easily understood projection of these particular participant's lives.

WOMEN AND ROMAN RELIGION
Jessica Russell
Location: Ballroom, 1:30 PM - 3:30 PM
Category: History, Political Science, and Economics, Poster
Mentor(s): Jon Frey (Art History, Classics)
This research project explores the use of religion as an element of social control over the lives of women in the Roman world. First I will explore the popular perception of women as a dangerous element in the male-dominated Roman society which resulted in their exclusion from many practices and institutions. Next I will discuss the important procreative aspect of women and the way in which the regenerative needs of Roman society created a conflict for men who would seek to completely exclude women. I will then argue that Roman religious institutions offered an effective solution to this conflict inasmuch as specific cult activities provided an outlet for Roman women while still keeping their activities strictly regulated and controlled. In the end, I believe that the evidence of specific religious festivals shows that a sexual categorization of women as virgin, matron, or prostitute developed as the most effective way to control women within Roman society.

HOCKEY STICK STRUCTURE
Derek Sabiston
Location: Gold Room A, 9:30 AM - 11:30 AM
Category: Engineering, Computer Sci, and Math- Section 1, Poster
Mentor(s): Carl Boehlert (Materials Science)
The experiment that was conducted was used for the purpose of finding out information about hockey sticks: why they break, how they break, how they flex and the differences in flex. To find out this information, the different hockey sticks were cut into small pieces that were viewed in an electron microscope to see its internal structure. The microscope was also used to determine exactly what materials the sticks were made out of. The materials used in the sticks and how these materials are structured in the sticks provide useful information on how and why hockey sticks work. The highly magnified pictures provide valuable information that is impossible to acquire with the naked eye. The common materials used in hockey sticks are wood, aluminum, and composite designs that include fiberglass, carbon fiber, and even kevlar.

FEMTOSECOND LASER INDUCED IONIZATION DISSOCIATION (FS-LID) TANDEM MASS SPECTROMETRY FOR THE ENHANCED CHARACTERIZATION OF SINGLY PROTONATED PHOSPHOPEPTIDE PRECURSOR IONS

Kyle Safran

Location: Gold Room, 9:30 AM - 11:30 AM

Category: Biochemistry and Molecular Biology-Section 1, Poster

Mentor(s): Gavin Reid (Chemistry), Scott Smith (Chemistry)

Phosphorylation is an important protein post-translational modification (PTM) involved in a wide variety of biological functions. These functions are dependent on the location at which proteins are phosphorylated. Currently, phosphorylation sites are identified by tandem mass spectrometry (MS/MS) methods, typically employing collision induced dissociation (CID) or electron transfer dissociation (ETD) as the activation technique. CID-MS/MS is often unable to unambiguously determine the positions of phosphate groups on peptides with multiple phosphorylation sites, due to the facile loss of the PTM, or intramolecular phosphate group rearrangements. ETD is a fragmentation technique that has the ability to accurately localize phosphate groups (the PTM is not cleaved during the activation process), but it is limited in that it requires a precursor ion that is multiply-charged. A new activation technique, femtosecond laser induced-ionization/dissociation (fs-LID), has been observed to provide unequivocal sequencing of low charge state phosphopeptide ions. Notably, fs-LID results in the observation of 'sequence' ion types resulting from fragmentation along the peptide backbone, with no loss or rearrangement of the phosphate group, allowing unambiguous characterization of the peptide sequence and localization of the modification. An interesting aspect of fsLID is that it is most amenable to the analysis of singly-charged species, making this method ideal for coupling with matrix-assisted laser desorption/ionization (MALDI), a widely-used ionization technique which produces primarily singly-charged ions.

IDENTIFICATION OF THE PROTEASE RESPONSIBLE FOR THE DEGRADATION OF MUTATED PROTEINS OF THE T2SS

Derek Samarian

Location: Gold Room, 1:30 PM - 3:30 PM

Category: Cell Biology, Genetics, and Genomics-Section 3, Poster

Mentor(s): Michael Bagdasarian (Microbiology and Molecular Genetics)

In Vibrio cholerae, EpsG is an essential protein that plays a role in the Type II secretion system. Strains of Vibrio cholera with the epsG gene mutated by one amino acid have resulted in both functional and non-functional secretion systems. In mutations that result in a non-functional secretion system, the mutated EpsG protein is not found when using immunoblot techniques. This indicates that the mutated protein is being degraded by a protease in the periplasmic space. A possible protease identified as DO is suspected of this degradation because of its genetic similarity to a periplasmic protease found in E. coli known as DegP. By inactivating the gene that encodes DO by insertion of a gentamicin resistance gene, we are able to see if DO is in fact a protease in the periplasmic space of Vibrio cholerae that is responsible for degrading misfolded or denatured proteins. The gene that encodes DO was cloned in a plasmid and inactivated in E. coli. Through conjugation, a strain of Vibrio cholarae already containing the mutated epsG gene was introduced to the vector and recombination of the inactive DO gene occured in the chromosome. Using the sacB gene on the vector, selection was done for cells that had only the mutated version of the gene encoding DO by plating on sucrose agar. Colonies suspected of containing only the inactive gene for DO have been purified and await verification via DNA electrophoresis.

THE ANATOMY AND PHYSIOLOGY OF THE COMMON HOUSEFLY (FANNIA CANICULARIA)

Aaron Sayfie

Location: Gold Room, 9:30 AM - 11:30 AM

Category: Engineering, Computer Sci, and Math- Section 1, Poster

Mentor(s): Carl Boehlert (Engineering)

The household fly is seldom given much interest or consideration, and rarely viewed as more than a menace to society and nuisance to picnickers. This research study investigates the anatomy and physiology of a common housefly (Fannia canicularia) in an effort to shed light upon the some of its truly intriguing qualities. It is intended to provide comprehensive information of the flies anatomy and physiology in order to enlighten others of the many interesting qualities of the fly that make it unique and interesting. The project will present information of how the highly adapted qualities of the fly are key to its survival, and why this matters to the human population. Supplementing the details of the flies anatomy and physiology will be images taken through environmental scanning electron microscopy (ESEM). The goal of the research topic is to highlight the crucial parts of the fly's anatomy, describe the mechanisms and functions that make it a crucial part of the flies physiology, and to clearly show these specific examples through ESEM images. This is important because a fly is one of the more simple creatures of the animal kingdom, and understanding the complexities of even the simplest of creatures can illuminate the immense biological and physiological scale in which other, larger creatures operate on. It provides a first step towards the further understanding of more complex organisms.

THE BUILDING BLOCKS OF BEAUTY

Alyssa Schafer

Location: Ballroom, 9:30 AM - 11:30 AM

Category: Physical Sciences, Poster

Mentor(s): Carl Boehlert (Chemical Engineering and Materials Science)

My research focuses on the microscopic structure of butterfly, moth, and dragon fly wing scales, and how the physical color, species, wing function, and wing size affect the structure. This research is important not only for sake of increased knowledge and understanding, but by looking at these structures, replications can possibly be made in which that information and design may be applied to build stronger and better structures and materials in society. My findings will show the differences in wing structures for butterflies, moths, and dragonflies and how these structures vary due to species differences, wing size variation, wing function, and physical color differences. My findings will also show what inner wing structures are the strongest and most durable and what contributes to the most ideal structure or for what wing structure is best suited for various functions.

ENVIRONMENTALLY FRIENDLY BUILDINGS ON THE CAMPUS OF MICHIGAN STATE UNIVERSITY: LEED CERTIFICATION
Alison Schuitema
Location: Ballroom, 9:30 AM - 11:30 AM
Category: Environmental and Natural Resources-Section 1, Poster
Mentor(s): April Allen (School of Planning, Design, and Construction), Michael Velbel (Geological Sciences)
According to the United States Green Building Council (USGBC), buildings in the United States are responsible for 39% of CO2 emissions, 40% of energy consumption, and 13% of the water consumption per year. Because of this, the USGBC has developed a program called the Leadership in Energy and Environmental Design Green Building System, commonly referred to as LEED. This program is a third-party certification system that determines if a building was designed and built using environmentally friendly strategies across several categories: energy savings, water efficiency, CO2 emissions reduction, improved indoor environmental quality, and stewardship of resources and sensitivity to their impacts. If a building meets enough of the requirements specified in these categories, it can become LEED certified, demonstrating "leadership, innovation, and environmental stewardship" by the building's facilitators. Since being environmentally friendly is especially important in the 21st century, a group of students is studying the Human Ecology building on the campus of Michigan State University. The goal is to prove that the building is environmentally friendly enough to become certified, and then to suggest additional improvements that could be made on the building to make it more sustainable for the future. This is being done by researching the building's renovation history and present use, including water efficiency and energy usage. This analysis will also provide a valuable framework for future sustainable campus construction and renovation projects.

PEOPLE AND THE ABSTRACT: A STUDY OF THE RELATIONSHIP BETWEEN IMAGES AND EMOTIONAL RESPONSE
Makena Schultz
Location: Gold Room, 1:30 PM - 3:30 PM
Category: Social Science: General-Section 3, Poster
Mentor(s): Carl Boehlert (chemical Engineering and Materials Science)
My research focuses on how different demographics of people react to abstract images of everyday objects. The demographics to be studied will include age, hometown location population, and gender. The abstract images will be taken using a Scanning Electron Microscope. The objects to be photographed will include but not be limited to: diamond, insect, ceramics, and metals. This research is important in the understanding of "nature and nurture" in relation to the emotional response toward the abstract and creative expression outlets. This information could be valuable in selecting exhibitions in museums to be directed toward a specific demographic or in the advertising industry when trying to understand a specific audience. This research is also important to my personal understanding of the Scanning Electron Microscope and alternative uses of technology in science. My findings will show how separated groupings of each demographic category feel in response to each photograph they observe. This will provide insight to any variation in these specified demographic categories and if said variation elicits any alternative emotional reaction. The objective of this poster is to focus on the data collected through surveying randomly selected subjects and the analysis of the data to deduct if there is any variation amongst groups. The poster will conclude with the rejection or support of the hypothesis, and additional information on the translation of images into emotional feelings within a subject.

DAUGHTERS OF KHADIJAH: PERSEPOLIS AS AN ALLEGORY
Lynette Score
Location: Ballroom, 1:30 PM - 3:30 PM
Category: Humanities and Peforming Arts, Poster
Mentor(s): Kim Cohen (English)
"Persepolis", a graphic novel by Marjane Satrapi, is the bildungsroman of a young woman in Iran during the Islamic revolution. When read closely, the text functions as an allegory for occurrences in the Islamic holy scriptures, particularly those pertaining to the female members of Muhammad's family. In this allegory, "Persepolis"' protagonist represents Zainab, Muhammad's granddaughter, while her mother represents Fatima, Muhammad's daughter, and her grandmother represents Khadijah, Muhammad's first wife. "Daughters of Khadijah: Persepolis as an Allegory" explores the implications of Satrapi's allegory, linking it with studies on women's roles in Iran and how they are drawn from those of women in the Koran. The project concludes that "Persepolis" is a uniquely feminist work that calls to attention the vitality of the women in Muhammad's family as role models and as key players in the rise of Islam.

BEHAVIOR OF CANINE BONE MARROW DERIVED MESENCHYMAL STEM CELLS IN COMMERCIALLY AVAILABLE BONE GRAFT AND SCAFFOLDING PRODUCTS
Katelynn Shaw
Location: Gold Room, 1:30 PM - 3:30 PM
Category: Cell Biology, Genetics, and Genomics-Section 3, Poster
Mentor(s): Terri Zachos (Orthopaedic Surgery)
Fractures in veterinary patients are common, with incidence of impaired fracture healing reported to be as high as 8%. Autogenous cancellous bone graft has been used to augment bone healing however a limitation of autogenous bone graft that can be obtained from the patient has led to the development of commercial products for use in fractures and non-unions. Commercial forms of freeze-dried corticancellous bone graft (Osteo-Allograft ®), Calcium phosphate scaffolding (BD 3D Scaffolds ®), and beta-tricalcium phosphate (Cerasorb ®) have been developed to enhance bone healing in both canine and feline patients. While all have been used to encourage union, there has been little research done as to how effective they are at stimulating the cells involved in bone production. Bone marrow derived mesenchymal stem cells (BMDMSC) are multipotent, being able to differentiate into multiple cell lines --including osteoblasts. Osteoblasts are responsible for bone production. This project looked at BMDMSC behavior with each of the commercial bone regeneration products. The cell-graft substitutes were then incubated for nine days. Samples of media and BMDMSC-graft substitutes were collected on days 0, 3, 6, and 9. Evaluation of differentiation factors via ELISA testing, observations using SEM and light microscopy, and RNA analysis were utilized to show growth and effectiveness of each of the products in producing pre-osteoblasts in vitro.

EVALUATION OF THE EFFECTIVENESS OF DIFFERENT FORMULATIONS OF THE ANTI-TUMOR DRUG CISPLATIN
Kelly Shaw
Location: Parlor B, 10:45 AM
Category: Cell Biology, Genetics, and Genomics, Oral
Mentor(s): Vilma Yuzbasiyan-Gurkan (MMG/CVM)
Cisplatin is a drug originally developed at MSU and is commonly used in the treatment of a variety of human and canine cancers. It consists of a central platinum atom with two cis amine groups and chlorine groups. It is administered intravenously in a saline solution. Novel methods of "packaging" the drug in a slow release mode are being developed to increase exposure of the tumor tissue to the drug. One such method under development by our colleagues involves the use of a hydrogel scaffold. The major focus of the current study is to determine whether the scaffold-encased drug, when released, will exhibit similar properties to the normal drug with regard to inhibition of cell proliferation. The proliferation rates of the cells with each of the drug formulations will be tested by the MTS assay, which reflects the level of metabolic activity of the cells. Effects will be assessed on the mammary tumor cell line MDA-MB23, the mouse fibroblast cell line NIH3T3, and the canine osteosarcoma cell line D17. Our preliminary findings show that using the normal formulation of cisplatin, the concentration required to kill 50% of the cells (LD50) is 10 ug/mL for NIH3T3 and 3.8 ug/mL for D17, respective86ly. We will compare these findings with the LD50s obtained from the cisplatin released from the scaffold.

AMBIGUITIES IN NUMBER MORPHOLOGY: COPING WITH INCONSISTENT PHONOLOGICAL VARIATION
Ashlee Silva
Location: Ballroom, 9:30 AM - 11:30 AM
Category: Psychology-Section 1, Poster
Mentor(s): Cristina Schmitt (Linguistics)
In Spanish, plural morphology is overtly marked in the noun phrasse by adding /s/ to nouns, adjectives and determiners, while the singular morphology is not overtly marked. Only the absence of the plural marker signifies singular morphology. Mexican Spanish is systematic in marking plural morphology; the pronunciation of the syllable final [s] is obligatory. However, in Chilean Spanish, a process known as lenition causes the syllable final [s] to be weakened. The plural becomes pronounced as an aspiration [h] or is omitted [Ø]. This process conceals the overt realization of the number morphology, causing singular and plural to have the same form. In this case, how is quantity information encoded in Chilean versus Mexican children and adults? Do Chileans use more quantity words than Mexicans to make up for the lack of systematic plural markings? If so, do the Chileans also show less subject agreement because they rely on quantity words? The hypothesis is that the variation produced by lenition in Chilean Spanish causes the plural marker to be unreliable and, therefore, the children rely on and use more quantity words to distinguish plurality. This study will examine the Miller-Schmitt (2008-2009) Corpus to analyze speech from Chilean and Mexican children and mothers. A regression analysis using the GOLDVARB program will be used to examine the variation of tokens within the speech. The results of the study may highlight subtle dialectal differences previously unnoticed and/or different strategies used to cope with ambiguities in the realization of number morphology.

OSIMS AND THE 2008 ELECTION
Kristin Skaggs, Erin O'Connor
Location: Lake Superior Room, 1:30 PM
Category: Communication Arts and Sciences, Oral
Mentor(s): Geri Alumit-Zeldes (Journalism)
Legacy media --namely ABC, CBS, NBC, CNN, FOX News Channel and National Public Radio faced Facebook and other Online Social-Interactive Media (OSIMs) during the 2008 presidential race on two levels. One was as a source in news stories and the other was as a resource for furthering their news products. The purpose of this paper was to probe the former. Overall, results showed that the legacy news media had minimal coverage of OSIMs's impact on the election. An analysis of news coverage yielded distinct frames: Obama's use of OSIMs as superior to McCain's; OSIMs encouraged more dynamic political involvement; and OSIMs as a resource for election coverage.

THE HIV/AIDS VACCINE: HARMFUL OR HELPFUL
David Skutt, Elizabeth Bukovick
Location: Gold Room, 1:30 PM - 3:30 PM
Category: Social Science: General-Section 2, Poster
Mentor(s): Mark Largent (History)
Our research examines whether the HIV/AIDS vaccine is harmful or helpful to those it has been tested on and whether it should continue to be tested. We will analyze whether HIV/AIDS vaccine testing is hurting those who are given the vaccine as well as whether techniques to limit the virus's influence, including some techniques already used in the United States, should be implemented worldwide. We became interested in discovering the motives that pharmaceutical companies have for testing vaccines in other countries. Many times these companies outsource testing to bypass U.S. safety procedures that protect those being tested. We have researched the HIV/AIDS virus and its vaccine testing protocols to determine whether or not a vaccine is the best answer to the AIDS epidemic. We will analyze the laws that are set up for vaccine testing and how the AIDS vaccine lines up with those guidelines. We will also discuss the efficacy of vaccines should one be developed in the near future. This research will help us gain a better understanding of the AIDS virus and how it can best be treated.

RACE AND GENDER IN THE 2008 PRESIDENTIAL ELECTION
Eric Slenk, Seth Beifel, Elizabeth Dunham
Location: Lake Superior Room, 2:45 PM
Category: Communication Arts and Sciences, Oral
Mentor(s): Fred Fico (Journalism), Geri Alumit-Zeldes (Journalism)
Television news coverage has become increasingly prevalent in today's society, especially in regards to presidential elections. The larger research project addresses the relationship between race and gender of reporters during media coverage of the 2008 presidential election and

the race and gender of the non-candidate sources used. This particular research examines the difference in the total number of non-candidate sources between the six television stations studied: PBS, NBC, CNN, CBS, ABC, and FOX. In order to determine the results, quantitative data was utilized to calculate the percentage of stories that used non-candidate sources. The figures collected were used to establish the percentage of stories that failed to use non-candidate sources and subsequently, the results of each station was compared and analyzed. The gathered information is important because the number of non-candidate sources could suggest how reliable or unreliable a television station is considered. This could be important for viewers to understand future presidential elections and the possible bias undertones of news stations.

EXPLORING THE MECHANISMS BEHIND INTRATASK CHANGE IN WORKING MEMORY
Bridget Smeekens
Location: Ballroom, 1:30 PM - 3:30 PM
Category: Psychology-Section 3, Poster
Mentor(s): Ryan Bowles (Psychology)
Several studies indicate that working memory span decreases in relation to age because of increasingly inefficient inhibition mechanisms, allowing proactive interference to accumulate. Alternatively, other findings suggest that strategy production can also account for differences in recall during working memory span tasks. Younger and older adults were tested with one of two versions of an Ospan task to determine the influence of proactive interference vs. strategy production. As expected, younger adults performed better than older adults, although both groups performed better in the descending version of the task. Results also show evidence to support both proactive interference and strategy production.

FROM LADIES FIRST TO BARBIES: THE EVOLUTION OF THE FEMALE MC
Brittany Smith
Location: Lake Erie Room, 1:45 PM
Category: Social Science: General-Section 2, Oral
Mentor(s): Pero Dagbovie (History)
After more than a 20-year span, the female MC has undergone major construction and some would even question her relevance today. Fast forward to 2010, the only female rapper with mainstream success and who receives regular airplay is newcomer Nicki Minaj. The contemporary female rapper illustrates the condition and status of the young black woman in American society. In my research paper, I will be discussing the state of the contemporary female rapper, the history of Hip Hop and the role black women played in it, the rise in popularity of female rappers in the late 1980s to late 1990s, how feminism plays a key role in this issue, historical roots to blues and jazz and how these rappers are a reflection and, at times, misrepresentation of black women. In the male-dominated arena of Hip-Hop music, female rappers could and would create their own space; using their talents and position as women to take a stance against misogyny, racism and sexism. During the late 1980s to the mid-1990s, female MCs were indeed here to stay and were successful in their own right. During this time period, the rap scene would see an abundance of female rappers from MC Lyte to Eve. It was also during this time frame, that she began to transform from the afrocentric, socially-conscious "lady" who demanded her respect as a woman to the "queen bitch," whose overt sexual lyrics and image forever changed the definition of what it meant to be a successful female rapper.

ANXIETY ATTENUATION THROUGH SPIRITUAL AFFECT IN BREAST CANCER SURVIVORS
Christian Smith
Location: Ballroom, 1:30 PM - 3:30 PM
Category: Psychology-Section 3, Poster
Mentor(s): Laura Symonds (Radiology and Human Medicine)
An increasing body of research suggests that religiosity and spirituality can positively impact both physical and mental health. One possible mechanism for this effect is that religious schema/spiritual feelings reduce anxiety, with concomitant changes in biological systems that affect health. For example, religious schemas may attenuate anxiety by providing a framework in which an individual reappraises a negative event or state. In addition, recent studies suggest that inducing or enhancing spiritual affect can attenuate the experience of pain. However in these studies it is not clear whether pain is experienced as less intense because individuals are feeling more spiritual per se, or are in a more general state of positive affect/happiness. Preliminary fMRI evidence in our lab indicates that spiritual versus general positive affect activate different brain regions which suggests that these two feeling states may be dissociable at the neural level and may also modify pain or other negative states in different ways. In the study presented here we use music to differentially induce or enhance states of spirituality and happiness, and we assess the relative effectiveness of these two states on the reduction of anxiety in women who are survivors of breast cancer. Results from the study have implications for the relationship between religion/spirituality and health, the design of intervention programs aimed at increasing quality of life in physically ill patients and the current body of spirituality and health studies.

"FACEBOOKING" THE CHICAGO SCHOOL OF ECONOMICS
Christopher Smith, Martin Fox
Location: Ballroom, 1:30 PM - 3:30 PM
Category: History, Political Science, and Economics, Poster
Mentor(s): Ross Emmett (Political Theory and Constitutional Democracy)
During the 20th century, the Chicago School of Economics utilized a model of collaboration consisting of a series of workshops. Each workshop included various members of the school's faculty separated into their areas of academic focus. As a continuation of our work from the previous year, which centered on the "web" of interrelationships that connected the various workshops, we attempted to reconstruct each workshop in order to better understand the interactions of the actors within them. Using a model based on the popular social-networking site, Facebook, we created profiles of Chicago faculty, which included assorted parts of their bodies of work, ultimately helping us see what connections appeared. Analyzing the "popularity" of each member of the faculty, that is, how often connections appeared with others, aided us in finding the critical nodes within the workshops. Knowing the most important players in the Chicago School's workshop model betters our understanding of how the model functioned.

GRETTENBERGER DAIRY WASTEWATER TREATMENT
Jason Smith
Location: Ballroom, 1:30 PM - 3:30 PM
Category: Environmental and Natural Resources-Section 2, Poster
Mentor(s): Steven Safferman (Biosystems Engineering)
The purpose of this project is to evaluate the potential of using bioretention basins, grassy filter strips, and artificial wetlands as a means of treating wastewater from dairy facilities. More specifically, this research will determine empirically whether a bioretention basin connected in series with a filter strip treats runoff from a small dairy farm economically and efficiently, as well as determining whether or not an artificial wetland can treat wastewater from milking operations. Currently, there are few options for a farmer to economically treat impacted storm water and wastewater yet the problem can result in contamination of water resources leading to nuisance complaints and regulatory fines. If the design is adopted, government subsidies under the EQIP program is likely.

DYNAMIC MOBILIZATIONS IN CERVICAL FLEXION: EFFECTS ON INTERVERTEBRAL ANGULATIONS
Kelly Smith, Emma Hill
Location: Ballroom, 1:30 PM - 3:30 PM
Category: Agriculture and Animal Science, Poster
Mentor(s): Hilary Clayton (LACS), Narelle Stubbs (LACS)
The purpose of this study was to measure flexion of the intervertebral joints in the neck and back as the horse performed dynamic mobilization exercises in which the chin was moved to three positions: chin-to-chest, chin-between-carpi, and chin-between-fore-fetlocks. Eight horses were evaluated using motion analysis technology to track reflective skin markers attached to each horse's head, transverse processes of the cervical vertebrae, and spinous processes of the thoracolumbar and sacral vertebrae. Adjacent markers were joined to form segments and angles were measured between segments on the ventral side. Segment angles were measured relative to the vertical. Intervertebral angles at end range of motion for the mobilization exercises were compared with a neutral standing position using repeated measures ANOVA ($p<0.05$). The largest angular differences were found in the cranial and caudal cervical joints. Also, joints in the thoracic region and at L1 showed significantly more flexion (3-7°) in the chin-between-carpi and chin-between-fore-fetlocks mobilizations. The results indicate that the joints at the extremities of the cervical column are primarily responsible for sagittal plane position and motion of the head and neck. Dynamic cervical flexion with a lowered neck also flexes the thoracic intervertebral joints. This information is useful in recommending exercises for performance enhancement and rehabilitative programs, for treating conditions such as cervical facet arthritis and impinging dorsal spinous processes.

UNEXPECTED GROWTH PATTERNS IN SOIL BACTERIA
Rhiannon Smith
Location: Ballroom, 1:30 PM - 3:30 PM
Category: Microbiology, Immunology, and Infectious Disease-Section 4, Poster
Mentor(s): Thomas Schmidt (Microbiology), Clive Waldron (Microbiology)
When diluting a suspension of bacterial cells, the number of colony forming units (cfu) is expected to decrease in proportion to the dilution. However, previous students in this research class found that when diluting a suspension of bacteria extracted from soil, the number of colonies decreased much more than expected. We again observed for soil bacteria that a decrease in cfus that was not proportional to the dilution. We did find a proportional decrease in cfus after successive dilutions of a pure Escherichia coli culture. Compared to the plates from a corresponding dilution of pure E coli, our soil bacteria results showed ten times fewer colonies. Our goal now is to determine why diluting soil bacteria causes this lack of cfus on our least diluted plates. One approach we are taking is to isolate and identify representative colonies from the least diluted and the most diluted plates. We are looking for environmental factors that might affect plating by changing the growth conditions for bacteria from soil extracts. This research could provide new understanding of how microbes might function in the complex communities found in nature.

EFFECT OF PACKAGING ON THE EVOLUTION OF THE AROMA COMPOUNDS IN BLACKBERRY FRUIT DURING COMMERCIALIZATION
Joe Smolarski
Location: Ballroom, 9:30 AM - 11:30 AM
Category: Health, Food, and Wellness, Poster
Mentor(s): Eva Almenar (Packaging)
Aroma plays an important role in the acceptance of the fresh produce. Aroma has been reported as a complex pattern where many compounds such as alcohols, esters, aldehydes, ketones, acids and others are involved. The extrinsic factors packaging and storage can significantly affect this quality parameter. Packaging is used to prolong the quality of the fresh produce. Different packaging designs and materials can be used to create a proper environment. In this study, the effect of four different packages on the evolution of the aroma profile of blackberry fruit was compared during storage. Different designs: open and enclosed packages, and different packaging materials: bio-based and petroleum-based ones were tested. 'Chester' blackberries were packaged in the aforementioned packages and then stored at 3oC for three weeks. The identification of the main aroma volatile compounds of blackberry fruit was performed by gas chromatograph-mass spectrometry (GC-MS) and SPME fiber. The aroma compounds ethanol, ethyl acetate, hexanal, trans-2-hexenal, 2-heptanone, ethyl hepanoate, 2-ethyl-1-hexanol, D-limonene, 1-hexanol, and nonanal were identified. The quantification of these compounds during storage was determined by gas chromatograph (GC-FID). Different aroma profiles were developed during storage and these were identified as dependent on the packaging design and on the packaging material.

ERROR ANALYSIS IN ESTIMATING TEMPERATURE-DEPENDENT THERMAL DIFFUSIVITY AND KINETIC PARAMETERS USING HEAT PENETRATION DATA

Andrew Sommerlot

Location: Gold Room, 1:30 PM - 3:30 PM

Category: Engineering, Computer Sci, and Math-Section 2, Poster

Mentor(s): Kirk Dolan (Food Science and Human Nutrition, Biosystems and Agricultural Engineering)

Growing consumer demand for nutraceuticals has stimulated interest by food companies to increase levels of these health-promoting compounds. Thermal processing of canned foods in a retort produces a unique problem: some of the nutraceuticals are highly sensitive to temperature, and require accurate parameter estimates to predict their fate during processing. Error in temperature measurement due to heat conduction through the can-mounted thermocouple assembly could potentially have significant effects on kinetic parameter estimation, especially in this study, where the rate constant (k) increases exponentially with temperatures above 100°C. The error due to heat conduction has been quantified and correction factors for time-temperature curves have been published for over fifty years. However, many of these studies used over-simplified geometries to describe the thermocouple in a computer model, or used experiments that could introduce errors other than heat conduction though the thermocouple assembly. In these studies, thermal diffusivity (κ) was calculated, it was assumed constant over the temperature range; even though it is known that κ in food varies ~10% over a 100°C range. Therefore, the purpose of this study was, for heat penetration studies in canned foods, to determine the effect of thermocouple presence on error in a) temperature measurement, b) estimation of temperature-dependent thermal diffusivity of the canned food, and c) estimation of nutraceutical kinetic degradation parameters. Experiments used to find the error in temperature measurements introduce other errors to the data, such as position of the thermocouple hot junction and moisture convection inside the can. In addition, the resolution of the thermocouple itself may not be sensitive enough to identify this conduction error. Evaluating heat conduction down the thermocouple assembly with a computer simulation model provides a faster, easier way to isolate the error. COMSOL with MATLAB was used to design two separate models for comparison. Finite element heat transfer analysis was preformed on both models to calculate can center temperatures throughout the simulated retort process. The real life geometry of a thermocouple inserted inside an arbitrary canned food product was approximated and resulting temperatures used as experimental data points. Another model without the thermocouple was made and subjected to the same boundary conditions. The resulting can center temperatures, thermal diffusivity parameters, and kinetic degradation parameters for anthocyanin (a nutraceutical) from both of these models demonstrated how much error can be expected in experimental data due specifically to heat conduction through the thermocouple assembly.

SPATIAL AND TEMPORAL PATTERNS OF POLYCHLORINATED BIPHENYL LOADINGS IN INLAND LAKE SEDIMENTS OF THE UPPER GREAT LAKES REGION

Janelle Sommerville

Location: Parlor C, 10:30 AM

Category: Environmental and Natural Resources, Oral

Mentor(s): David Long (Geological Sciences)

Sediment cores taken from large inland lakes indicate a regional atmospheric gradient of PCB deposition. Large lakes tend to integrate a large atmospheric signal and the chronostratigraphic record from large lakes subject to within lake processes such as mixing. To gain additional insight, sediment cores were taken on a north-south transect from Michigan inland lakes, that integrate signals at the watershed level and serve as an isolated record. Sediments were analyzed for ²¹⁰Pb to obtain accumulation rates and inventories of PCBs and were used to determine the role of the atmosphere in contaminant loading. If the atmosphere is the major pathway of PCBs in the Great Lakes basin, then the focus-corrected inventories of each lake will be similar in addition to similar trends in the sediment accumulation rates over time. The onset concentration of PCBs is the earliest in the southern most lake and the most recent in the northern most lake. The focus-corrected inventories from the lakes are dissimilar and peak accumulation rates vary over a span of 33 years from 1932 to 1965. The highest focus-corrected inventory is in southern Michigan, followed by the northern Lower Peninsula, and the lowest in the Upper Peninsula. In recent times, the accumulation rates of all lakes have also followed this depositional trend, decreasing from south to north. The results support the gradient observation from the large lakes, that there is not complete atmospheric mixing of PCBs, but that there are local watershed scale influences.

REGULATION OF C-SIGNAL DEPENDENT PROMOTER 4406 DURING DEVELOPMENT OF MYXOCOCCUS XANTHUS

Bongjun Son

Location: Gold Room, 1:30 PM - 3:30 PM

Category: Biochemistry and Molecular Biology-Section 2, Poster

Mentor(s): Lee Kroos (BMB)

Myxococcus xanthus is a soil bacterium that provides a model for investigating cell-cell signaling and gene regulation. Upon starvation, *M. xanthus* forms multicellular fruiting bodies and expresses genes that lead to sporulation. C-signaling, which depends on contact between cells and communicates positional information, is essential for this developmental process. Previous studies have shown the importance of C-signaling in regulation of gene expression, and the □4406 promoter region is under C-signal control. Three *cis*-regulatory elements have been identified upstream, downstream, and proximal to the □4406 promoter. The upstream element has a negative effect, whereas the downstream element has a positive effect on promoter activity. Electrophoretic mobility shift assays (EMSAs) show cooperative binding of two proteins, MrpC2 and FruA, to each of the three sites. MrpC2 is a transcription factor induced by starvation that also plays a second role in regulating programmed cell death during the developmental process. FruA is involved in the response to C-signal. Using 5' and 3' deletions, and multiple-base-pair changes, one end of the upstream element has been localized between -120 and -110, and one end of the downstream element has been localized between +93 and +116, relative to the transcriptional start site. In each case, a FruA binding site appears to define the end of the element, and binding of FruA to that site is important for regulatory function of the element.

USING NONSENSE WORDS TO INVESTIGATE CHILDREN'S UNDERSTANDING OF COMPARATIVES
Christopher Spencer, Aaron Levin, Valerie Nauta
Location: Ballroom, 9:30 AM - 11:30 AM
Category: Psychology-Section 2, Poster
Mentor(s): Alan Munn (Linguistics), Cristina Schmitt (Linguistics)
In previous studies it appears that a majority of four and five year-olds do not understand comparatives. In a study by Bishop and Bourne (1985), children were shown three different pictures; one with different colored objects of the same size, two with different colored objects of different size. Children were asked to match comparative and absolute sentences with real and nonsense size-related adjectives to these three pictures. An absolute sentence is formed in the following manner: “The blue cow is big and the green cow is big.” On the other hand comparative sentences are created in the following form: “The blue cow is bigger than the green cow.” Our experiment was based off of this study and was modified to see if using tangible objects in the experiment would have an effect on comprehension of comparatives. Using a truth value judgment task with a blindfolded puppet, children were asked to determine if a statement made by said puppet about a given comparative situation with different colored and sized animals was right or wrong. We hypothesized that children will have better comprehension of comparatives than previously shown by Bishop and Bourne.

THE MANY FACES OF FLAVIUS JOSEPHUS
Shaun Spivak
Location: Tower Room, 12:00 PM
Category: History, Political Science, and Economics, Oral
Mentor(s): Christopher Frilingos (Religious Studies)
It has become common and conventional for historians to view the actions of Flavius Josephus during the period of the Roman Jewish War as deceptive, dishonest, and traitorous. There is a misconception of Flavius Josephus spreading "roman propaganda" with his writings and being manipulative and unfaithful to the Jews during the time of the destruction of Jerusalem in 70 AD. With historical evidence, I would like to argue that Josephus had many other, often religious, prerogatives to his actions rather than strictly a regard for his own well being.

PLANT BIOLOGY
Michael Spoelstra
Location: Gold Room, 9:30 AM - 11:30 AM
Category: Cell Biology, Genetics, and Genomics-Section 1, Poster
Mentor(s): Federica Brandizzi (Plant Biology)
The Golgi Apparatus is an integral part of the Eukaryotic cell’s secretory pathway, involving an assortment of proteins for signaling and directing vesicles (small, membrane-bound, carriers of important cell components) to various parts of cell systems. Recent studies identified a novel golgin (tethering protein) in the trans-Golgi Network (TGN) identified as GDAP1 (GRIP-related ARF-binding domain containing Arabidopsis protein 1) (Matheson et al.). In order to identify the function of GDAP1 and its homologues in eukaryotes, we have begun to use live-cell imaging (using fluorescent protein markers) coupled with the use of gene-knockdown through RNAi to identify where GDAP1 affects protein trafficking, as well as what possible genes may be affected due to gene silencing and whether GDAP1 is integral to cell viability. Through the use of a variety of markers, targeting various cell components in Arabidopsis thaliana (i.e. the cell wall, the endoplasmic reticulum, the apoplast, etcâ€¦) it can be visibly shown where GDAP1 contributes to protein trafficking, as well as to what extent. Further studies regarding the affect of gene silencing of GDAP1 on the phenotypes of A. thaliana are also underway.

USE OF THE MIDDLE T PATHWAY TO UNDERSTAND THE ROLES OF AP-1 AND ETS IN TUMOR PROGRESSION
Chelsey Spriggs
Location: Ballroom, 9:30 AM - 11:30 AM
Category: Microbiology, Immunology, and Infectious Disease-Section 2, Poster
Mentor(s): Michele Fluck (Microbiology and Molecular Genetics)
Middle T protein, encoded by the mouse polyoma tumor virus, provides a good model for breast cancer progression. It induces a phosphorylation cascade which activates the Ap-1 and Ets/PEA3 transcription factors that control genes involved in progression. Ap-1 is a dimer that consists of c-fos and jun. Our lab is working to find ways of inhibiting Ap-1 and Ets with the hope of finding a way to control the onset and progression of cancer. We use tumor-derived cells. Met cells contain the wild type Middle T and are metastatic and Db cells have a mutant Middle T and are not metastatic. Western blots were performed on the cell lines and demonstrate changes in the fos + jun cellular proteins between Met and Db cells. We showed that Met cells, but not Db cells, can grow in agar and both can grow in Matrigel reflecting their differences in transformed phenotypes. We have expressed a mutant version of jun, called Tam-67, in both Met and Db cells. This mutant has a deletion in the transactivation domain and competes with wild type jun. We found that Tam67-Met cells show a total loss of the capacity to grow in agar; the potential of Tam67-Db cells to grow in Matrigel is also diminished. This reveals that both Middle T and Ap-1 are essential in this transformation pathway. We are currently working to block the activity of Ap-1 and Ets through the use of oligodeoxynucleotide decoys of the Ap-1 and Ets binding sites.

AN EXAMINATION OF ENJOYMENT IN GROUP EXERCISE UNDER VARYING TASK CONDITIONS
Matthew Steck
Location: Ballroom, 9:30 AM - 11:30 AM
Category: Health, Food, and Wellness, Poster
Mentor(s): Deborah Feltz (Kinesiology), Brandon Irwin (Kinesiology)
This study examined enjoyment of physical activity under varying degrees of interdependence within group exercise. Enjoyment is an important predictor of intention to exercise, an important factor in initiating and maintaining exercise programs (Papacharisis, Simou, Goudas, 2003). Group exercise has shown higher levels of enjoyment than individual exercise (Lox, Martin, Petruzzello, 2003). Group exercise is commonly practiced with little or no interdependence between participants. Basic social psychology research shows that higher levels of

interdependence are linked to increased motivation (Vroom 1964; Karau & Williams, 1993). The primary purpose of this study was to examine differences in enjoyment between groups with varying levels of interdependence. Ss were male (n = 65) and female (n = 93) undergraduate students (20.43 + 2.83y). Ss were randomly assigned to one of four conditions (individual, coaction, additive, and conjunctive) in a 4 (Conditions) x 2 (Gender) factorial design. Ss were tested on a series of abdominal exercises. Exercise partners (confederates) were displayed on a projection screen. Dependent measures were motivation (persistence in s), enjoyment, and intention to exercise. Regression analysis confirmed enjoyment as a predictor of intention to exercise ($p < .05$). A one-way ANOVA showed significant motivation differences between task conditions ($p < .05$). Specifically, motivation was significantly higher in all partnered conditions than the in the individual condition. No group differences in enjoyment were found. Results suggest that there are no disadvantages to interdependent group exercise with respect to enjoyment, with the added benefit of increased motivation.

TRANSIENCE, CONTROL, AND CONTEMPORARY CHINA: SONG DONG'S AESTHETIC RESPONSE
Anna Stein
Location: Lake Huron Room, 11:30 AM
Category: Humanities and Peforming Arts-Section 1, Oral
Mentor(s): Karin Zitzewitz (Art and Art History)
In this project, I investigate the performance and object art of Song Dong, a contemporary Chinese artist who is personally underrepresented in scholarly research despite his numerous exhibitions and ever-growing influence on the contemporary art scene. Through the research of interviews, exhibition reviews, institutional websites, scholarly articles, and monographs, I aim to contextualize Song Dong's work among other contemporary Chinese artists as well as against changes in contemporary Beijing, cultural traditions, and the growing power of consumerism in Chinese mass culture. How do Song Dong's themes of transience, urban changes, and attempted control translate into an aesthetic response to said changes and traditions? Where does Daoism inform his decisions on permitting transience or expressing a desire to maintain control, both aesthetically and psychologically? Have these works become a coping mechanism for the artist in post-Cultural Revolution Beijing, and if so, in what ways are his contemporaries coping with the same cultural scenarios? Song Dong's works cover a range of personal experiences and distinctly Chinese aspects of culture. However, by investigating these questions in my research, I intend to demonstrate how these works fulfill the basic human desire to understand and maintain a sense of control and reality in one's own environment.

JAPAN'S BURAKUMIN AND MINORITY LEGITIMACY IN A GLOBAL CONTEXT
Garrek Stemo
Location: Lake Erie Room, 1:30 PM
Category: Social Science: General-Section 2, Oral
Mentor(s): John Davis (Anthropology)
This project compares discrimination against Japan's burakumin minority, also known as Japan's "invisible race," and minority populations in the United States and France. The predicament of the burakumin appears to be an unusual case of marginalization due to a lack of any conspicuous markers of difference between members of this group and mainstream Japanese society. Examining how the burakumin have been defined throughout history and comparing this to other minorities reveals basic similarities in how the perception of difference takes root in human societies and becomes a basis for discrimination and prejudice. I use quantitative analysis of population data, analysis of fictional and ethnographic literature and utilize case studies. Data is collected from surveys, ethnographic material, published reports and journals. I scrutinize changes in public policy, education and social behavior to evaluate the effectiveness of these reforms in bringing the burakumin into the mainstream of Japanese society. I then assess the generalizability of policies enacted by the Japanese government in Japan by considering how these policies would play out in other national contexts such as the United States. I propose an effective solution consisting of a two-pronged approach addressing both education and community development where minorities in question reside. Educational reform can alleviate social barriers that may hinder full social participation on the part of minority populations. Development programs targeted at minority communities within a given country allow for the allocation of resources making it possible for entire groups to attain a degree upward mobility and acceptance.

CREATING AN AMERICAN PARADISE: THE HULA GIRL IN ADVERTISING ART
Christina Stone
Location: Lake Huron Room, 2:00 PM
Category: Humanities and Peforming Arts-Section 2, Oral
Mentor(s): Phylis Floyd (Art and Art History)
This presentation focuses on how the hula girl has been used in commercial advertising and influenced perceptions of the Hawaiian people. The former colonial relationships existing between the Hawaiian Islands and the U.S. mainland at the height of the travel boom shaped prevalent conceptions of an idyllic paradise and created a distorted image of this native culture. Early depictions of the hula girl within the native Hawaiian culture functioned in a different capacity than the evolved stereotype used for commercial purposes. Examining select representations of the hula girl over a span of a century in newspapers, posters, advertisements and other popular imagery, this research assesses how her likeness conveyed certain impressions of the Hawaiian culture to the U.S. mainland. This presentation demonstrates how the hula girl image has been and continues to be used commercially, not only to sell products, but in tourist advertisements and to promote a false ideal of Hawaiian life.

LOCALIZED BRAIN ACTIVATION VIA BOLD-FMRI ANALYSIS: SOLVING MATH PROBLEMS VERSUS VIEWING STILL PICTURES
Preethy Subramanian, Natasha Bhaskaran, Brad Lichota
Location: Parlor C, 11:45 AM
Category: Psychology, Oral
Mentor(s): Jie Huang (Radiology)
The purpose of this experiment was to find out how the brain activates differently when solving math problems than when viewing still pictures. Six right-handed, neurologically healthy individuals (3 male, 3 female), participated in a research project using the blood oxygenation

level dependent (BOLD) functional Magnetic Resonance Imaging (fMRI) technique. Neural firings deplete oxygen and cause changes to blood flow and blood volume. Oxygenated and deoxygenated hemoglobin have different magnetic properties. A local neural firing-induced blood oxygenation level change results in a local MRI signal change that is associated with the local brain activation. Each subject had four functional scans and one anatomical scan. The functional scans involved two different cognitive tasks: solving math problems and viewing still pictures. The stimulus paradigm for the functional scans consisted of twelve task periods alternated with twelve rest periods. Each period, both task and resting, lasted eighteen seconds. Using AFNI, an image-processing program, the signal intensity time courses of the functional scans were correlated with an ideal brain response function resembling the task paradigm, and activated voxels were defined to be at or above a certain threshold value for the correlation coefficients. Our results support the hypothesis that overall brain activation is different between solving math problems and viewing pictures. A preliminary comparison of brain activation showed that solving math problems exhibited overall more brain activation than viewing pictures. Additionally, different local activities were observed between the two tasks.

VIRAL COMMUNICATION IN THE THEATRICAL PERFORMING ARTS
Kris Sundberg
Location: Green Room, 9:30 AM
Category: Digital Media-Section 1, Oral
Mentor(s): Kirk Domer (Theatre)
Viral Communication in the Theatrical Performing Arts explored the influence of creativity in the Department of Theatre and its immediate impact on recruitment and marketing endeavors. The research assistant has a dual interest in Theatre and Telecommunications and this duality complimented the research and creation of theatre-related video projects. Research surrounded current trends in theatre-related documentaries, promotional videos and online theatrical dramaturgical projects on the academic and professional level. Research analyzed successes and failings of current available data which resulted in several unique video works through consultation with professors in the Department of Theatre. Final videos documented casting, research, rehearsal, and the design process including performance footage which was ultimately compiled into a series of dramaturgical commercials capturing the creative process. These commercials serve as recruitment and publicity tools for the Department of Theatre and the College of Arts and Letters and will also be used to enhance online and blended teaching components.

THE TARRED GARDEN: DESCRIPTIONS OF LANDSCAPE IN 19TH CENTURY SOUTHERN LITERATURE
Katharine Anne Symanow
Location: Lake Huron Room, 11:45 AM
Category: Humanities and Peforming Arts-Section 1, Oral
Mentor(s): Lloyd Pratt (English)
My presentation will begin with a brief history and definition of African American literature and the importance of the slave narrative in the context of that history. I will then compare descriptions of landscape in slave narratives to the descriptions of the Southern landscape of their Anglo counter parts, specifically that which glorifies the "Old South." This examination will reveal the differing attachments, and political relationships, to physical region of the South and the implications of that relationship in contemporary literature.

PERCEPTION, BEAUTY, AND CORRECTNESS
Emily Syrja
Location: Ballroom, 1:30 PM - 3:30 PM
Category: Psychology-Section 3, Poster
Mentor(s): Carl Boehlert (Chemical Engineering and Materials Science)
Because photographs taken with scanning electron microscopy (SEM) are taken at such a high magnification, they are not usually recognizable, especially to those who are unfamiliar with SEM imaging. Exposure to microscopic images can, then, be confusing, and the discovery that such images actually depict familiar objects and materials can evoke strong emotions. These emotions tend to be even stronger when the familiar object is depicted in such a way that the observer's perceptions about that object are forced to change. This study focused on participants' attitudes toward common objects before and after exposure to SEM images of those objects. Some of these objects were mundane items that the participants likely see on a daily basis; others were chosen because they are typically conceived as beautiful or ugly. At the end of the study, the participants were told whether their perceptions of the objects' beauty or ugliness matched their perceptions of the SEM images', then asked to discuss their feelings on this new knowledge. Results were mixed; some participants' perceptions were, of course, significantly more closely matched than others', and reactions to the matched results were diverse. Rather than a conclusive study, this has been, as it was intended, a project that sheds some light on human beliefs about beauty as well as a cultural preoccupation with correctness.

MIRNA DETECTION
Travis Tagami
Location: Ballroom, 9:30 AM - 11:30 AM
Category: Microbiology, Immunology, and Infectious Disease-Section 1, Poster
Mentor(s): Yong-Hui Zheng (Microbiology and Molecular Genetics)
MicroRNAs are ~22 nucleotide non-coding RNA sequences that play a role in regulation of genes in both plants and animals. They were initially discovered in the nematode species C. elegans. MicroRNAs work by downregulating the expression of mRNA. They can do this by either binding to mRNA in the 3`UTR and disrupting translation, or by cleaving the mRNA at specific sites complementary to the microRNA. Since their initial discovery, they have been found in abundance in both plants and animals, playing various roles in regulating several genes. I will be performing a quantitative assay using PCR to detect levels of human microRNA let-7g. This microRNA was chosen on the basis of recent findings connecting this molecule with the life cycle of Human Immunodeficiency Virus, HIV-1. This mature microRNA will first be isolated from two different samples of T-cell lines using an RNA purification kit. Then it will be transcribed into DNA using a stem loop primer and reverse transcriptase. PCR will then be conducted in order to amplify the target sequence, and the final product will be validated by gel electrophoresis.

EXAMINING IMMIGRATION REFORM IN THE 2008 PRESIDENTIAL CAMPAIGN
Lauren Talley
Location: Lake Superior Room, 1:00 PM
Category: Communication Arts and Sciences, Oral
Mentor(s): Geri Alumit-Zeldes (Journalism)
A Scripps wire service article published on Feb. 16, 2010 revisited the issue of immigration reform, stating that the polarizing topic remains the country's third most important issue behind health care reform and the economy. Just two years ago, then presidential candidate Barack Obama campaigned on a platform to establish amnesty or a pathway to citizenship for illegal immigrants. This study investigates coverage of immigration debate during the 2008 presidential campaign by arguably the most influential news outlet: National Public Radio. I will measure the amount of coverage as well as examine the sources interviewed. Finally, I will determine the outlet's framing of the immigration issue, parsing out the Democrat and Republican sides.

TRANSCRIPT PROFILE OF HEXOSE TRANSPORTERS ALONG THE HORSE GASTROINTESTINAL TRACT
Nathanael Taylor
Location: Parlor A, 11:30 AM
Category: Agriculture and Animal Science, Oral
Mentor(s): Nathalie Trottier (Animal Science)
Dietary carbohydrate imbalances and hexose mal-absorption in horses have been implicated in the etiology of many metabolic disorders such as laminitis and colic. To test the hypothesis that glucose and fructose transporter transcripts are in lower abundance in the large intestine compared to the small intestine of the horse, the gene expression of glucose transporters GLUT1(SLC2A1), GLUT2(SLC2A2), GLUT5(SLC2A5), and SGLT1(SLC5A1) was assessed by measuring mRNA abundance using relative quantitative PCR. Four adult horses euthanized due to illness unrelated to gastric disturbances were used. Mucosal samples were taken from two segments of the small intestine, i.e., distal jejunum and ileum, and three segments of the large intestine, i.e., cecum, left ventral colon and left dorsal colon. The 2delta-delta CT method was used to compare the segments to that of the jejunum, using GAPDH and B-actin as housekeeping genes. Relative to the jejunum, GLUT1 abundance was not different in the ileum and left ventral colon and increased in the cecum ($P = 0.02$) and left dorsal colon ($P \leq 0.01$). Tra nsporters GLUT2, GLUT5 and SGLT1 mRNA abundances were not different in the ileum and decreased in the cecum ($P \leq 0.01$), left ventral colon ($P \leq 0.001$) and left dorsal colon ($P \leq 0.01$) relative to the jejunum. The low abundance of GLUT2, GLUT5 and SGLT1 in the large intestine, indicates that there is no significant glucose, galactose or fructose absorption across the large intestine of the horse. The physiological relevance of increased GLUT1 abundance in the equine large intestine is unclear.

A SELF-STRUCTURING TWO-PORT NETWORK
Andrew Temme
Location: Gold Room, 9:30 AM - 11:30 AM
Category: Engineering, Computer Sci, and Math- Section 1, Poster
Mentor(s): Edward Rothwell (Electrical Engineering)
A self-structuring two-port network has been proposed that consists of a large patch etched over a ground plane with several conducting wires used to short the patch to the ground plane via thirty-two computer-controlled switches. By changing which pins are shorted to ground, each port's transmission and reflection characteristics can be altered. The thirty-two switches present a very large number of possible configurations, 2^32. Due to this large number of configurations, this work makes use of computer simulations, random search techniques, and genetic algorithms in order to explore and study the characteristics of the two-port network. The characteristics of these various configurations were statistically analyzed by measuring the transmission and reflection coefficients for each configuration tested. This analysis showed that there exist significant differences between states such that the two-port may be configured as an adjustable attenuator, phase shifter, or filter. Further testing demonstrates that the two-port has the potential to be used as a matching network to transfer the maximum possible power from one device to another, such as from a radio transmitter to an antenna.

FAMILIAL NEEDS OF PARENTS LIVING WITH A MENTAL ILLNESS
Claire Thams, Irda Kape
Location: Gold Room, 9:30 AM - 11:30 AM
Category: Social Science: General-Section 1, Poster
Mentor(s): Joanne Riebschleger (School of Social Work)
One of five Americans has a mental illness. Children living with a parent with a mental illness are at high risk for separations from parent/s, living in poverty, poor school performance, parent-child role reversal, and poor self-esteem. Despite these environmental, plus genetic predispositions to inherit the mental illness, the children remain “invisible.” Mental health providers rarely collect information about the prevalence of parenting, basic needs of the parents, or needs of the children. The research questions for this descriptive study ask: How frequently do adults presenting for public mental health services have minor children?; What do parent consumers say about their basic needs?; and What resources and information are requested by consumer parents to meet the needs of their children and families? Survey data are drawn from intake forms completed by all adults with children; the adults are presenting for public mental health services at a mental health agency in southeast Michigan. This is one of the few agencies in the nation that routinely collects information from consumer parents. The survey data asks about basic needs, mental health issues, family social support, child characteristics/behaviors, resource needs of children, parenting challenges, and life stressors. Parent survey data (parent n = 109) were coded into SPSS, a statistical program for social sciences. Data were analyzed using frequency analyses for parenting prevalence, parent basic needs, and resources/information for children. Implications for practice, policy, and research are offered. This study builds knowledge for increasing attention to consumer parents and their children.

THE ROLE OF OBESITY-RELATED INFLAMMATION ON THE HEPATIC IRON REGULATORY PROTEIN HEPCIDIN
Andrew Thompson
Location: Parlor A, 1:45 PM
Category: Health, Food, and Wellness, Oral
Mentor(s): Kate Claycombe (Food Science and Human Nutrition)
Iron deficiency remains the most common nutrient deficiency in the world and is currently the number one cause of clinical anemia in adults. This deficiency of iron has serious long-term and irreversible effects on kidney functions and also fetal development in children born of iron-deficient mothers. Recent studies have shown that obese humans and animals have significantly higher risks for developing anemia. Obese individuals also have increased inflammatory factor levels in blood which can possibly stimulate hepatic iron absorption blocking factor (hepcidin). To date, no studies have addressed whether increased inflammatory factor production in obesity causes increased hepatic hepcidin production in animal models of obesity. Thus, the aim of this research project was to investigate the interconnected nature of obesity and effects of obesity-associated increases in inflammation on iron nutriture. Specifically, I hypothesized that increased liver production of hepcidin (iron absorption blocker) in obese animal models causes anemia by increasing inflammatory factor interleukin-6 (IL-6). Using the Western Blot and ELISA assays, I tested hepatic hepcidin protein levels and showed that expressions were highest in liver samples of ob/ob mice followed by high-fat fed diet induced obese mice compared to control mice. I also showed that these hepcidin protein expression levels correlate to serum inflammatory cytokine IL-6 levels that were measured in the same animals. Taken together these preliminary data indicate that obesity associated increases in hepatic hepcidin expression (that can potentially lead to pre-anemic and anemic states) occur via activation of IL-6 secretion in obese animals.

WHAT'S THE MEANING BEHIND ALL THIS? A CONTENT ANALYSIS OF ANGLER SURVEY COMMENTS
Patricia Thompson
Location: Ballroom, 1:30 PM - 3:30 PM
Category: Environmental and Natural Resources-Section 2, Poster
Mentor(s): Frank Lupi (Fisheries and Wildlife)
Fisheries management agencies are mandated to protect, restore, and enhance the societal benefits provided by our fishery resources. Understanding angler needs, preferences and behaviors is vital for focusing management efforts. The Michigan recreational angler survey is a state-wide, monthly mail survey developed and sponsored by the Michigan Department of Natural Resources and Environment (MDNRE) Fisheries Divison, the MDNRE Institute of Fisheries Research and Michigan State University faculty. The survey collects demographic and fishing behavior information and includes ample space for anglers to leave comments. The principle objective of this research is to conduct a content analysis of angler comments to improve our understanding of angler attitudes, preferences, and uses of the State's fisheries. Thousands of anglers offered a wide range of open-ended comments. The comments were entered by a research technician into Microsoft Access and imported into Nvivo8.0, a content analysis program to assist with coding the comments and assigning themes. Several dominant themes were identified, and statistical tests were conducted to examine relationships between angler comment themes, various fishing behaviors, and demographic variables. By combining both qualitative and quantitative survey data, the results provide managers with additional insight into the types of anglers that express certain opinions, attitudes, and needs. The enhanced understanding of anglers opinions can help managers communicate with anglers and provide the information they need to effectively manage and provide angling opportunities for the diverse groups fishing in Michigan.

VACCINATION AND THE PREMATURE INFANT
Sara Tischler
Location: Ballroom, 9:30 AM - 11:30 AM
Category: Health, Food, and Wellness, Poster
Mentor(s): Mark Largent (James Madison)
The past several years have seen an increase in rates of autism spectrum disorders among young children. This struck fear in the hearts of parents for obvious reasons. Desperately seeking answers, many cling to the belief that autism is due to the immunization of our children. While this argument is debatable, it struck me as odd that the focus has been more on the immunizations themselves rather than the age of the child upon receiving them. It is perhaps common knowledge that infants born pre-term are often considered high-risk due to their vulnerability and weakened immune systems. These infants have not had the proper amount of time to develop in the womb. Yet physicians across the United States are insistent upon immunizing these children at the same time as their peers, based on chronological age rather than gestational age. Based on extensive research on the vulnerability of premature infants and the effects immunizations can have on weakened immune systems, I believe it is crucial to begin discussing an immunization system based on gestational age so as to eliminate potential risks and narrow our focus when studying vaccines and the issues surrounding them.

EXPLORING GEOGRAPHIC RACIAL EQUALITY IN THE UNITED STATES
Berlinda Tolsma
Location: Gold Room, 9:30 AM - 11:30 AM
Category: Social Science: General-Section 1, Poster
Mentor(s): Joe Darden (Geography)
This paper determines to what extent geographic racial equality exists between Asians and Whites in Miami Dade County, Florida. I hypothesize that less than 10 percent of the 35 municipalities of Miami Dade County would be areas of geographic racial equality. Data were obtained from the 2000 U.S. Census Summary File 4 and Summary File 3. A ratio was computed to analyze the data for Asian and White median household income. The percent of Asians and Whites aged 25 and older with a bachelor's degree or higher was also compared along with the percent of the population age 16 and older with a managerial or professional occupation. The level of residential segregation was determined by computing an index of dissimilarity by census tract for each of the municipalities in Miami Dade County which confirmed that in some municipalities in Miami Dade County, the Asians had achieved geographic racial equality with Whites. In conclusion, there are 2 municipalities of the total of 35 municipalities in Miami Dade County that have attained geographic racial equality. Of the entire population of Miami Dade

County, 0.12 percent of the Asians and 19.5 percent of the Whites live in places of geographic racial equality. The hypothesis was accepted, due to the fact that 5.7 percent of the 35 municipalities of Miami Dade County were areas of geographic racial equality.

THE PERFORMANCE PROCESS WITH SPECIAL NEEDS STUDENTS
Sarah Tomek
Location: Lake Huron Room, 1:45 PM
Category: Humanities and Peforming Arts-Section 2, Oral
Mentor(s): Joni Starr (Theatre)
Theatre can be a safe an effective way to bring about positive change in an individual. Though it takes great personal risk to take the stage, there are benefits to completing a rehearsal and performance process. Communication and connection are typically difficult among special needs students, but through dramatic practices can be made more accessible. By writing, rehearsing, and performing a theatrical play, a group of special needs students at Heartwood School has seen improvements in these areas and thus have felt a great sense of personal accomplishment. This year the students have had input in every aspect of the musical production, Heartwood Circus. By grouping the students together in smaller performance groups, practicing improvisation before beginning the rehearsal process, and allowing the students freedom in designing costumes, props, and set pieces for the production, there have been great improvements in student interaction. Students have found an ease in communicating amongst themselves and with Heartwood staff members and in connecting to the work that is assigned to them.

CAMPUS ARCHAEOLOGY PROGRAM: GARBAGE OF THE PAST AND DORMS OF THE PRESENT
Daniel Tooman
Location: Gold Room, 1:30 PM - 3:30 PM
Category: Social Science: General-Section 3, Poster
Mentor(s): Lynne Goldstein (Anthropology)
The Michigan State University Campus Archaeology Program (CAP) is responsible for the preservation and mitigation of archaeological resources on the MSU campus. In early May 2009, CAP was contacted by the MSU Physical Plant to monitor a discovery made while renovating the Brody Hall dormitory complex. A large trash deposit was discovered by construction workers at the site, facilitated by the digging of a deep trench for the installation of a water main. Before the discovery of this deep deposit, shovel testing by the CAP had been attempted. The depth of the trash deposit was beyond CAP's standard survey techniques. Given time constraints, the extent of the deposits, and the apparent origin of the deposits, CAP removed an artifact sampling from the site. Investigation of the deep trench uncovered by construction revealed refuse composed primarily of local and regional bottles. This serves as physical evidence of a City of East Lansing landfill that occupied the site from approximately the 1920s to the 1950s. The contents of this deposit provide insight into the economic relationships and refuse habits at the campus, local, and regional levels. Monitoring of the site continued throughout construction, turning up notable artifacts linking to the site's additional use as an MSU horse facility in the 1940's.

ANTI-VACCINE SENTIMENT IN THE PRESENT DAY
Travis Tully
Location: Lake Erie Room, 1:15 PM
Category: Social Science: General-Section 2, Oral
Mentor(s): Mark Largent (History)
Vaccines have evolved from their basal beginnings to become something that many parents feel are a necessity for the health of their children. However, the presence of skeptics has increased dramatically in recent years. With the advancements of vaccine research and technology, one would think that there would be fewer items of which to be leery. Skeptics of vaccines have found many aspects of vaccination practices that disagree with what they feel is safe for individuals. My research focuses on the problems that anti-vaccine groups find with vaccine administration and the vaccines themselves. In particular, I will study the web sites of the Global Vaccine Awareness League and ThinkTwice Global Vaccine Institute. The statements on these websites give a solid picture of what people fret about with regards to vaccines. I will also look into studies and reviews that have already been conducted regarding the websites of anti-vaccine groups.

TECHNOLOGY AND AGING PROJECT: A TECHNOLOGY TRAINING PROGRAM FOR OLDER ADULTS
Caitlin Tupper
Location: Gold Room, 1:30 PM - 3:30 PM
Category: Social Science: General-Section 2, Poster
Mentor(s): Amanda Woodward (Social Work)
The use of Information and Communication Technologies (ICTs), such as the Internet, has become crucial to broadening social connections and strengthening bonds between individuals. These bonds can be linked with a decrease in feelings of loneliness and depression, while also promoting greater mental health. Only thirty-five percent of older adults in the U.S. currently use ICTs which is less than any other age group (Pew Internet and American Life Project, 2008). One reason for lower ICT use among older adults is lack of appropriate training. Technology and Aging Project was developed to provide older adults with ICT training and investigate if increased ICT efficacy was correlated with aspects of mental health, such as increased social support. The study involved 83 participants from a rural Michigan county, all aged sixty years and older. Forty-five participants were randomly assigned to receive training, while the remaining thirty-eight were assigned to a control group. Data collection occurred at baseline, 3 months, 6 months, and a follow up at 9 months. Measures of loneliness, depression, perceived social support, social networks, computer self-efficacy, and ICT use and ownership were included in data collection. By the three month period, members of the experimental group reported increased frequency of using ICTs (e.g., the use of email increased from 44% to 67%). In comparison to the control group, the experimental group had higher scores in perceived social support and computer self-efficacy. Additionally, greater confidence in ICT use was linked to increased frequency of using ICTs.

PREFERENTIAL FEEDING OF FRESHWATER SNAILS BASED ON BACTERIAL AND ALGAL AVAILABILITY
Lauren Tuski, Karen Beatty, Ryan Hayes
Location: Ballroom, 9:30 AM - 11:30 AM
Category: Environmental and Natural Resources-Section 1, Poster
Mentor(s): Allison Rober (Zoology)
Many studies have been done to determine the feeding habits of benthic consumers such as snails, which depend on nutrients obtained from periphyton. Periphyton covers most substrates in aquatic ecosystems and is composed of algae and heterotrophic bacteria. Previous studies showed that snails prefer algae to other periphyton components and ingest it at high rates. However, bacteria are commonly ingested as well, either purposely or inadvertently. The aim of our study was to determine if snails would preferentially feed on either algae or bacteria when both were available. We colonized 5 x 5 cm ceramic tiles in two aquariums with periphyton from the Red Cedar River in East Lansing, Michigan. We placed one aquarium in full sunlight and added nitrogen and phosphorous to facilitate algal colonization while the other aquarium was placed in the dark to encourage bacterial colonization without algal growth. After three weeks of colonization, we performed our food choice experiment using three treatments (1) algae only tiles, (2) bacteria only tiles, and (3) a mix of algae and bacteria tiles. For a control, we covered four tiles in each treatment with a cage to prohibit grazing. Snails were allowed to graze the tiles (eight snails per treatment) for a period of seven days. Algal biomass stayed the same or decreased in grazed treatments, whereas bacteria biomass increased to levels greater than the control in all treatments. Our results indicate that the snails prefer algae over bacteria.

SYNOSIA AND AESTHETICS IN THE SCIENTIFIC METHOD
Lauren Tuski, Laura Blanton, Erica Shekell
Location: Gold Room, 1:30 PM - 3:30 PM
Category: Education-Section 2, Poster
Mentor(s): Robert Bernstein (Physiology, Natural Science), Norman Lownds (Horticulture)
As a global job market emerges, and financial hardships force schools to cut funds for new textbooks and other education aids, it has become increasingly important for teachers to teach in the most efficient and effective way possible so that the education levels of American students remain competitive with other nations. Professors Michele and Robert Root-Bernstein propose that successful scientists use the following 13 creative thinking tools to make discoveries: observing, imaging, abstracting, pattern recognition, pattern forming, analogizing, body thinking, empathizing, dimensional thinking, modeling, playing, transforming, and synthesizing. Professor Lownds and Poff have found that few of these thinking tools exist in scientific textbooks ranging from preschool to high school, and when they are present, they are the objective ones consistent with the scientific method. However, true appreciation for the scientific method requires the use of subjective tools as well. We set out to determine how frequently synosia, the combination of emotion, senses, and objective knowledge and aesthetic applications, such as beauty, elegance, wonder, and excitement, are used to teach the scientific method in textbooks. Textbooks from third, fourth, fifth, seventh, and tenth grades were read and analyzed for use of these tools. The results were consistent with Professor Lownds' findings, although the seventh grade textbook had a surprising number of aesthetic and synosia tools along with the preschool teaching aids.

A CONVENIENT COMPUTER-BASED METHOD TO PREDICT HETEROZYGOSITY OF CANINE MICROSATELLITE MARKERS
Scott Urquhart
Location: Gold Room, 9:30 AM - 11:30 AM
Category: Cell Biology, Genetics, and Genomics-Section 2, Poster
Mentor(s): Patrick Venta (Microbiology, Molecular Genetics)
An otherwise rare genetic disease can become common because of Founder events within any given breed of dog. Most of these high frequency diseases are recessively inherited, and so a breeder cannot easily know which dogs are carriers of the mutant gene. One goal of our lab is to develop methods to more quickly identify mutant genes so that DNA-based diagnostic tests can make it easy for breeders to distinguish carriers from homozygous normal dogs among potential breeding stock. An important method used to identify mutant genes is the candidate gene approach, which only works efficiently when combined with genetic markers that have high heterozygosity. Previous work has shown that, for human dinucleotide microsatellite markers, the number of perfect repeats is correlated with heterozygosity through a logistic curve. Based upon a preliminary observation, the hypothesis was tested that Smith-Waterman (SW) DNA alignment scores are correlated with perfect repeat number, and that SW scores can be used directly to predict the heterozygosity of any given marker. Strong support for this hypothesis was developed using heterozygosity data from previous published studies combined with SW scores available through the UCSC Canine Genome Browser. The practical result of this work is that it is now possible to rapidly identify highly variable markers within or near candidate genes quickly and inexpensively, which should ultimately improve our ability to rid purebred dog populations of common mutant disease genes.

2009 SPARTAN MARCHING BAND HALFTIME SHOW VIDEO & THE INITIATE
Andrew Vallentine
Location: Green Room, 10:30 AM
Category: Digital Media-Section 1, Oral
Mentor(s): Robert Albers (Telecommunications)
I directed and produced this short 4 minute video that played during the Michigan State vs. Iowa halftime show. It starts with a short video with some of the MSU football players, and ends with a mock-ipod commercial that played while the marching band preformed U2's Vertigo. The Initiate is a four part horror film, shot on the campus of Michigan State University during the summer of 2009. I will be presenting the first part.

INS2 AKITA MUTATION
Andrew Vallo
Location: Gold Room, 9:30 AM - 11:30 AM
Category: Cell Biology, Genetics, and Genomics-Section 2, Poster
Mentor(s): Laura McCabe (Physiology)
Unlike that of humans, the insulin system of mice consists of two genes including preproinsulin two and preproinsulin one. Preproinsulin two, commonly reffered to as Ins2, is an orthologous insulin gene to that of other mammals. Both genes encode for the production of proinsulin in the pancreas. A spontaneous mutation in the Ins2 gene, known as the Akita mutation, causes the development of type 1 diabetes and hyperglycemia in mice. Mice transgenic for the mutation are non obese diabetics and are viable and fertile. Preliminary research suggests that, similarly to humans, the Ins2 transgenic mice display several evident secondary complications associated with T1-diabetes. One such complication that we have taken considerable investigative interest in is the bone loss caused by T1-diabetes. Our data indicates that ten week old Ins2 mice experience nearly a 50% decrease in bone volume fraction when compared to their wild type littermates, similar to that of the pharmacologically induced 40 dpi streptozotocin (STZ, a beta islet cell cytotoxin) diabetic mice. Research with the Ins2 mouse allows us to confirm the diabetic bone pathology observed in the pharmacologic model and verify that the drug we use is not the cause of the pathology. Examining the spontaneous diabetic model could provide us with beneficial research in our attempt to determine a potential mechanism for T1-diabetic bone loss.

OSTEOBLASTS' RESPONSES TO HYDROXYAPATITE
Colleen Victor
Location: Gold Room, 9:30 AM - 11:30 AM
Category: Cell Biology, Genetics, and Genomics-Section 2, Poster
Mentor(s): Eldon Case (Chemical Engineering and Materials Science), Regina Irwin (Physiology), Laura McCabe (Physiology)
Hydroxyapatite (HA) is the surface on which mature osteoblasts and osteocytes interact. Synthetic HA, which is composed of calcium and phosphate [Ca10(PO4)6(OH)2], is commonly used as an implant or implant coating in orthopedic surgeries. It is known that the synthetic HA surfaces are bone-like and increase bone formation in these implants, but the mechanisms on how HA affects osteoblasts is unknown. In this study, the gene expression profiles of osteoblasts interacting with HA surfaces versus plastic surfaces were compared in order to discover which synthetic HA surface supports the greatest osteoblast differentiation. The gene expression was measured after 21 days. In addition, comparisons were made between the gene expression profiles of various types of HA discs, between non-cracked and micro-cracked discs. Methods included isolating the total RNA from each of the surfaces and verifying the RNA using gel electrophoresis. It is hypothesized that the discs made with either HA surface will allow for greater osteoblast differentiation, as compared to the discs made simply of plastic.

CLASSIFICATION ACCURACY OF ACCELEROMETER COUNT CUT POINTS DURING FREE PLAY IN CHILDREN AND ADOLESCENTS
Laura Vielbig
Location: Gold Room, 9:30 AM - 11:30 AM
Category: Education-Section 1, Poster
Mentor(s): Karin Pfeiffer (Kinesiology)
Introduction: It is important to determine if accelerometers (physical activity evaluation tools) accurately assess energy expenditure in free-living settings in order to determine how active children and adolescents are. The purpose of this investigation is to determine if accelerometer count cut points accurately classify physical activity (PA) intensity levels in children/adolescents during free play. Methods: Participants (22 children, 5-15 years old) wore a portable metabolic analyzer and Actical accelerometer while engaging in a simulated after-school program visit. Visits included structured and unstructured activity. PA intensity levels (sedentary (SED), light (LPA), moderate (MPA), or vigorous (VPA)) were assessed using activity energy expenditure (AEE) from the portable analyzer and cut points by Evenson et al. (2008) for the accelerometer. Sensitivity, specificity, and kappa were calculated to assess classification accuracy. Results: Sensitivity, specificity, and kappa values (respectively) for each PA intensity level follow: SED=0%, 98.6%, 0; LPA=89.7%, 49.4%, 0.21; MPA=9.5%, 92.4%, 0; VPA=63.9%, 87.1%, 0.52. Kappa across categories was 0.26. Conclusion: Actical cut points did not accurately classify SED and MOD, since sensitivity was low, specificity was high, and kappa values were zero. Conversely, the Actical cut points were somewhat accurate for LPA and VPA, since sensitivity was fairly high, specificity was high (for VPA), and kappa values were low. Cut points were most accurate for assessing VPA. Previous research in a laboratory-based setting showed comparable sensitivity and specificity to the current values (with the exception of SED), suggesting that classification accuracy may be similar in laboratory versus free play settings.

DEPLETION OF TRANSLATION FACTORS ELICITS DIFFERENT MOTILITY RESPONSES IN BACILLUS SUBTILIS
Michelle Vogel
Location: Ballroom, 1:30 PM - 3:30 PM
Category: Microbiology, Immunology, and Infectious Disease-Section 3, Poster
Mentor(s): Robert Britton (Microbiology)
We were interested in investigating the cellular responses to limitation of translation factors involved in the initiation and elongation phases of protein synthesis. DNA microarrays were performed on IF2 and EF-Tu depleted Bacillus subtilis. Surprisingly, genes involved in motility were up regulated in EF-Tu depleted cells and down regulated in IF2 depleted cells. To test if these changes in gene expression cause a phenotypic effect, we measured their motility via swarming assays. These were performed on plates with low agar concentrations allowing the cells to spread more easily. The initial studies show that EF-Tu depleted cells do indeed swarm while IF2 depleted cells have less motility than compared to wildtype as predicted by the DNA microarray. To insure that differences in swarming were due to changes in expression of the motility machinery and not cell growth, growth curves of IF2 and EF-Tu depleted cells were performed. Our results showed that in order for the two cell lines to have the same doubling time, the EF-Tu depleted cells requires twice as much expression as IF2 cells. A model incorporating cellular levels of GTP and protein synthesis will be presented.

DEVELOPING LITERACY AND IDENTITY: AN ANALYSIS OF ITEC AFTER SCHOOL PROGRAM AT PATTENGILL MIDDLE SCHOOL
Ryan Waldron
Location: Green Room, 1:45 PM
Category: Digital Media-Section 2, Oral
Mentor(s): Jeffrey Grabill (Writing, Rhetoric and American Cultures)
The purpose of my research is to explore the development in literacy skills and identity through making digital media by Pattengill Middle School students at the iTec after school program. My goal is to document the extent to which students develop new literacy skills and changes in identity as a result of project participation. I am particularly interested in whether students report satisfaction with the program's experience, whether participants develop identities as "makers," and whether or not they develop new literacy skills as a function of this experience. To answer my questions and achieve the goals of this project, I will use a structured interview of students to get at issues of satisfaction and issues of composing and identity and analyze student work for issues of literacy and identity. I anticipate that the results of my work will show the students' overall satisfaction with the program's experience, whether they have developed "maker" identities, and whether they have developed new literacy skills. This analysis will tell us about the efficacy of this program in achieving its goals, and show us ways in which it can achieve further success with middle school students.

OUTCOMES NEEDED TO BE ACHIEVED BY AGRISCIENCE AND NATURAL RESOURCES EDUCATION INTERNS DURING THEIR TEACHING FIELD EXPERIENCE
Renee Wangler
Location: Tower Room, 1:15 PM
Category: Education, Oral
Mentor(s): Jennifer Rivera-Caudill (Community, Agriculture, Recreation, and Resource Studies)
Currently, the state of Michigan does not have a set requirement of tasks and outcomes that Agriscience and Natural Resources (ANR) interns need to achieve during their field experience. In addition, little research has been done to determine the preparation that interns need during their internship year, especially in the ANR field. Therefore, the key objective of the project was to determine the outcomes ANR teacher education interns need to achieve while completing their teaching field experience. The purpose of the study was to gather input from current ANR teachers regarding the ANR education internship field experience. Fifteen teachers participated in two focus groups to provide outcomes they felt needed to be achieved by the ANR education interns during their field experience. The outcomes listed by the ANR teachers individually were compared and combined in a list of 153 outcomes. The results of the focus groups were used to construct a survey that was distributed to all ANR teachers in the state of Michigan. Participating ANR teachers ranked the importance of the outcomes in best preparing the ANR education interns for their future career. The results of the survey will be used to develop a framework for the ANR education internship field experience and inform programmatic changes such as course content, curricular experiences, and student teaching responsibilities for the MSU Environmental Studies and Agriscience curriculum.

EFFECT OF ORGANIC AND INORGANIC ZINC SUPPLEMENTATION ON EXPRESSION OF KEY ANTIOXIDANT GENES IN WEANLING PIGS
Renee Wangler
Location: Parlor A, 9:45 AM
Category: Agriculture and Animal Science, Oral
Mentor(s): Gretchen Hill (Animal Science), Patty Weber (Large Animal Clinical Sciences)
Zinc (Zn) is an essential trace element that at pharmacological concentrations affects genes involved in oxidative stress and amino acid metabolism. However, it is not known if Zn supplementation at physiological levels affects gene expression similarly. Therefore, the objective of our study was to evaluate the effect of Zn supplementation at NRC levels to weanling pigs on expression of Metallothionein (MT), Peroxiredoxin 4 (PRDX4), Glyoxalase (GLO1), and Aminoacylase 1 (ACY1). At weaning, 9 pigs were allotted to 3 pens on the basis of weight, gender, and litter. Each pen was fed 1 of 3 treatment diets, which included 1) basal diet (no Zn, but other trace minerals at 100% NRC level), 2) basal diet + 100 ppm Zn Bioplex, and 3) basal diet + 100 ppm Zn sulfate. At 10 days, pigs were slaughtered and liver samples collected for subsequent RNA isolation and amplification. Expression differences were measured between treatments. MT gene expression was significantly higher ($P<0.05$) in livers from pigs fed Zn supplemented diets. MT expression in pigs fed Zn Bioplex and Zn Sulfate was > 4 fold higher than in the basal diet. Bioplex Zn and Zn Sulfate diets did not differ in MT expression. Expression of PRDX4, GLO1, and ACY1 were not different between the three diets. Supplementation of organic and inorganic Zn to pigs enhances gene expression of a key antioxidant gene and may improve the animal's ability to combat oxidative stress.

RED CEDAR STUDENT ACTIVISM
Daniel Wardle, Jacquelyn Butler, Cody Hibbs, Karthik Khajana
Location: Gold Room, 9:30 AM - 11:30 AM
Category: Education-Section 1, Poster
Mentor(s): Kristin Renn (EAD)
In this exploratory, qualitative study we examined the past and present experiences of participants. We interviewed fifteen former student activists from Michigan State University, investigating why they got involved, what influence that had on their college experience, what they learned from being involved, and influence of involvement on life after college. These participants came from diverse backgrounds; college activities included sorority leadership, racial and ethnic student organizations, and student government. Many of these activists are currently pursuing or have achieved Ph.D.'s. They represent all facets of the urban spectrum, including inner-city Detroit and the farms of central Michigan to Miami, Florida. Preliminary findings suggest that each student's experience shows patterns across leadership, activism, and post-college careers. Important themes of our questions included family support for activism, influences of activism on professional lives, friend and peer reactions, and culture on campus.

WEALTH INEQUALITY AND MONETARY POLICY
Michael Watson, Elias Scheker
Location: Lake Superior Room, 11:15 AM
Category: Social Science: General-Section 3, Oral
Mentor(s): Jeff Biddle (Economics)
Is wealth inequality sensitive to changes in monetary policy, particularly the federal funds rate? Since the early 1910's, accurate measures of wealth concentration held by the top 1% of wealth owners have been estimated using estate tax records as well as the Survey of Consumer Finances. In our presentation we explore this question by regressing wealth concentration estimates on the Federal Reserve?s federal funds rate in order to demonstrate a positive relationship between wealth inequality and monetary policy. The results of our research will speak to the long-term social implications of policy stance. Specifically we see that if monetary policy is primarily focused on price stability and full employment then we are ignoring broader externalities that may arise.

EUGLENOID PHYLOGENY BASED UPON THE EVALUATION OF PROTEIN CODING AND RIBOSOMAL GENES
Donovan Watza
Location: Gold Room, 9:30 AM - 11:30 AM
Category: Cell Biology, Genetics, and Genomics-Section 1, Poster
Mentor(s): Richard Triemer (Plant Biology)
Over the past decade molecular phylogenies have been used to determine relationships among the major genera of photosynthetic euglenoids. However, the majority of these studies have relied on the use of nuclear or chloroplast ribosomal genes. The purpose of this study was to incorporate protein coding genes into euglenoid phylogenies and compare the results with those of ribosomal genes. The psbO gene, a nuclear encoded plastid targeting gene involved in oxygen evolution, and the HSP90 gene, a nuclear encoded heat shock gene that codes for a molecular chaperone, were sequenced for 52 euglenoid taxa representing the genera Euglena, Monomorphina, Cryptoglena, Colacium, Trachelomonas, Strombomonas, Phacus, Discoplastis, and Lepocinclis. The dataset for both the psbO gene and HSP90 gene were analyzed individually and in combination with the nuclear small subunit and large subunit ribosomal rDNA genes and the chloroplast small subunit ribosomal gene. The phylogenies inferred from the psbO and HSP90 sequences resulted in trees that were congruent with previous analyses based on ribosomal genes only. Moreover, the rooted Bayesian phylogenetic tree derived from the combined five gene dataset generated trees with stronger support for many of the deeper nodes than with the ribosomal trees alone. These results suggest that the nuclear genes as well as the protein coding genes all have phylogenetic utility and combined, yield a phylogeny that is more robust than that generated by any of the genes alone.

CEBP BETA AND BONE LOSS
Dani Michele Weinman
Location: Gold Room, 9:30 AM - 11:30 AM
Category: Cell Biology, Genetics, and Genomics-Section 2, Poster
Mentor(s): Laura McCabe (Physiology)
Aging causes increased marrow adiposity, which may be at the cost of osteoblast differentiation, leading to osteoporosis. CCAAT/enhancer binding protein B (C/EBPB) is a transcription factor important for adipocyte differentiation. C/EBPB also plays a role in osteoblast and osteoclast maturation, however, the role of C/EBPB has not been characterized in aged mice. Therefore, we aged C/EBPB knockout and wild type littermates to sixteen months and characterized their bone phenotype. Aged mice without C/EBPB were found to have a significant decrease in bone mineral content, bone mineral density, bone volume fraction, trabecular thickness, and trabecular number as well as an increase in trabecular spacing when compared to wild type mice. Bone parameters were more significantly reduced in male knockout mice compared to those of females. For example, trabecular number was reduced by 20% in male knockout mice compared to wild type but only 10% in female knockout mice. Male knockout mice lost 27% bone mineral density compared to wild type while female knockout mice had a 21% loss. Differences could be attributed to altered gender hormone status and differences in osteoblast and osteoclast parameters. Given that deficiency of C/EBPB accentuates bone loss in aged mice, a plausible extension of this finding is that C/EBPB upregulation may ameliorate bone loss with aging.

INGHAM COUNTYS SYSTEM OF CARE PROGRAM: IMPACT
Elizabeth White, Jessica Jensen
Location: Gold Room, 1:30 PM - 3:30 PM
Category: Social Science: General-Section 2, Poster
Mentor(s): Marya Sosulski (Social Work)
Multiple studies have demonstrated that social support plays a significant factor in the reduction of mental health disparities. In “Toward Explaining Mental Health Disparities,” Anshensel (2009) established a positive association between declining mental health status and social context, especially concerning stress-inducing social situations. The research further supports the development of programs to create social systems of support and resources such as Ingham County’s System of Care program, called Impact. Developed in 2005, Impact is a “partnership of child and family-serving agencies working together with youth and families to provide coordinated services for children with serious emotional disturbance” (www.impactsystemofcare.org 2009). The program was designed to improve community mental health in the greater Lansing area. Our research assesses the effectiveness of certain aspects of Impact, including: family guidance home based services, wraparound services, and the Impact family advocates.
Data are drawn from “Impact System of Care Family Advocacy Support Program Assessment” study, which uses critical narrative analysis techniques to analyze face-to-face interviews with families, administrators and other program personnel. The interviews reflect participants’ experiences with the Impact program, with special focus on the Family Advocacy Support component. The goal of the analysis is to demonstrate the link between participants’ satisfaction with individual aspects of the program and participation, as well as respondents’ interpretations of how effective they believe Impact to be. The results will contribute to broader knowledge about the effectiveness of this particular program and its overall implications for further development of support services to promote community mental health.

ELECTROSPUN TIN OXIDE FIBERS FOR GAS SENSING
Sara Wiederoder
Location: Gold Room, 1:30 PM - 3:30 PM
Category: Engineering, Computer Sci, and Math-Section 2, Poster
Mentor(s): Lawrence Drzal (CMSC)
Nano-scale tin oxide fibers were produced using an electrospinning process and used as the sensing element for a conductimetric gas sensor. Tin (IV) butoxide that had been functionalized with valeric acid was polymerized and then blended with polyvinylpyrrolidone (PVP) to form a viscous polymer solution. This solution was then electrospun onto a target producing a dense randomly aligned fiber mat with an average fiber diameter of 600 nm (as determined by analysis with an Environmental Scanning Electron Microscope, ESEM). Before testing fibers were calcined to burn off the PVP leaving pure SnO2 fibers with an average diameter of 300 nm. The calcined fibers were placed into a sensor cell and changes in the resistance of the fiber mat were recorded as a function of test gas (H2, O2, and argon) at 250ï‚°C.

SCIENCE AND THE POLITICS OF TRIBAL FISHERIES
Andrew Wildbill
Location: Parlor C, 10:00 AM
Category: Environmental and Natural Resources, Oral
Mentor(s): Kyle Whyte (Philosophy)
Environmental policy toward Indian tribes in the U.S. is increasingly coming to resemble the cooperative federalism model used between federal agencies and states. Universities and other scientific organizations are also trying to expand their collaborations with tribes. These developments are especially important with respect to the continuing growth of tribally-managed fisheries, but little is known about the best ways to organize these fisheries, whether the science differs from that used in fisheries managed by others, and what the political contexts determine organizational possibilities and strategies by fisheries managers. This research project focuses on the latter issue concerning the politics of tribal fisheries. The argument advanced through this research is that good science and strong organizations are closely related to the evolution of the political relationships among tribes, states, federal agencies, and other stakeholders, and that fisheries managers must engage with these political relationships as part of their professional responsibilities. The implication of this argument is that educational programs aimed at educating future tribal fisheries employees or other environmental professionals who might work with tribal fisheries requires a curriculum that covers the key political dimensions that have been identified in this project. This research has important environmental justice dimensions because working toward the improvement of tribal fisheries management through education and political awareness will enable more meaningful participation in environmental decision-making for tribal stakeholders.

PHYLOGENETIC CLASSIFICATION OF PYTHIUM INSIDIOSUM AND EXSERHILUM ROSTRATUM ISOLATES FROM CLINICAL SAMPLES
Christopher Woelk
Location: Ballroom, 1:30 PM - 3:30 PM
Category: Microbiology, Immunology, and Infectious Disease-Section 4, Poster
Mentor(s): A Leonel Mendoza (Microbiology and Molecular Genetics)
Clinical samples from a Florida horse suspected of being infected with Pythium insidiosum on an abdominal lesion and a biopsied tissue collected from the vestibular part of a goat nose were cultured on 2% dextrose Sabouraud agar. The isolated organisms were identified using morphological characteristics as P. insidiosum (a Protist straminopilan fungal-like microbe) and Exserhilum rostratum (a black fungus). The animals are suspected of having pythiosis, which is caused by P. insidiosum and phaeohyphomycosis caused by E. rostratum. Previous investigation on the phylogeny of P. insidiosum, has shown that this straminopilan pathogen clustered into three distinct clades. Clade I contains isolates from North, Central and South America, whereas Clade II comprises isolates from Australia and Asia. Interestingly, Clade III is harbored isolates from Thailand and the USA. These studies established that the phylogenetic relationships between P. insidiosum species based on sequence analysis of the internal transcribed spacers (ITS) within the fungal ribosomal DNA could be used to identify the origin of the isolates. This sequence information provides data that can be used in the diagnosis of pythiosis and in the differentiation of P. insidiosum from other similar clinical etiologies. We will take advantage of these data to phylogenetically classify the isolate recovered from the horse and confirm the identity of the strain identified as E. rostratum (using classical phenotypic features) from the goat.

COMPARING HUMAN AND PORCINE INFANT SKULL HISTOMORPHOLOGY TO FACILITATE RESEARCH ON PEDIATRIC CRANIAL TRAUMA
Paige Wojcik
Location: Lake Superior Room, 10:00 AM
Category: Social Science: General-Section 3, Oral
Mentor(s): Todd Fenton (Anthropology)
This study will establish the baseline histomorphological properties of the human infant parietal bone and the porcine infant parietal bone, which do not currently exist. Histomorphology, the study of microscopic features of bone, is useful in determining the growth and developmental patterns of the porcine infant and human infant skulls. This information is essential to understand the manifestations of cranial injury on a histomorphological as well as biomechanical level. The main goal of this research is to determine whether the porcine infant skull is a reasonable analog for the human infant skull in conducting research on pediatric cranial trauma. It is necessary to use the porcine skull as an animal model of the human skull due to a lack of pediatric cadaveric material. Previous research at Michigan State University suggests a correlation in cranial bone development between 1 day old porcine skulls and 1 month old human skulls based on biomechanical properties. This research tests the hypothesized correlation by comparing porcine bone histology to human bone histology. By comparing the appearance and thickness of diploë, endocranial thickness, ectocranial thickness, and secondary osteon size, number, and arrangement, I will determine if the hypothesized correlation in cranial bone development is valid in a histomorphological context.

CUSTODY BATTLES: EXPLORING SURROGACY POLICES AROUND THE UNITED STATES
Tina Wolverton
Location: Gold Room, 1:30 PM - 3:30 PM
Category: Social Science: General-Section 2, Poster
Mentor(s): Matt Grossmann (Political Science)
In the United States, surrogacy and egg donation policies vary considerably from state to state: whereas Michigan outlaws it and agreements cannot be enforced, California encourages it. Inspired by a *New York Times* article about a legal custody battle in Michigan over twins between a surrogate mother and the family who hired her, as well as similar cases, this project will look at these stories and the policies driving the court's decisions as well as explain how Michigan's surrogacy policy compares and contrasts with other states in the US.

DHA EXACERBATES EXPERIMENTALLY INDUCED COLITIS IN SMAD3 DEFICIENT MICE
Hillary Woodworth
Location: Ballroom, 9:30 AM - 11:30 AM
Category: Microbiology, Immunology, and Infectious Disease-Section 2, Poster
Mentor(s): Jenifer Fenton (Food Science and Human Nutrition)
Inflammatory bowel disease (IBD) increases the risk of developing colorectal cancer. It is hypothesized that dietary interventions can reduce inflammation and associated cancer risk. The long chain omega-3 fatty acid, docosahexaenoic acid (DHA) has potent anti-inflammatory properties. The objective of this study was to determine whether dietary DHA could reduce experimentally induced colitis and subsequent colon cancer risk. We utilized a mouse model of colitis and colon adenocarcinoma formation (SMAD3-/-). When SMAD3-/- mice are exposed to H. hepaticus, colitis is observed 4 wks post infection. Mice were fed AIN-93G powdered diets supplemented with corn oil, safflower oil, or DHA-rich fish oil (doses ranging from 0.75-6.00%) for 8 wks. Mice were then gavaged with H. hepaticus, continued on their diets and sacrificed 4 weeks post-infection. Colon and cecal tissue were collected for histopathology and scored for inflammation and dysplasia. Spleens and mesenteric lymph nodes were collected for CD4+ and CD8+ cell populations at 3,7, and 28 days post-infection. Contrary to expectation, DHA (6.00%) induced severe colitis and adenocarcinoma formation. Increased severity of colitis in DHA fed mice was associated with a attenuated FoxP3 T regulatory and CD8+ cell frequency amongst spleen and mesentery compared to mice fed the control diet. These results suggest that high levels of DHA supplementation in immune-associated diseases like IBD should be approached with caution.

CREATIVE THINKING TOOLS IN TEXTBOOKS
Kimberly Wren, Travis Jones, Ashley Sobczak
Location: Gold Room, 1:30 PM - 3:30 PM
Category: Education-Section 2, Poster
Mentor(s): Michele Root-Bernstein (theatre and dance), Robert Root-Bernstein (physiology)
Problem: Professors Root-Bernstein propose that creative scientists use thirteen "thinking tools": observing, imaging, abstracting, pattern recognition, pattern forming, analogizing, body thinking, empathizing, dimensional thinking, modeling, playing, transforming, and synthesizing. But Professors Lownds and Poff find few of these "thinking tools" in science textbooks. Hypothesis: The "Thinking Tools" assigned to our group consistent with the "scientific method" (pattern forming, dimensional thinking, modeling, analogizing) are more likely to appear than subjective ones such as playing, body thinking, and empathizing. Methods: Science textbooks used in third, fourth, fifth, seventh, and tenth grades were read by groups of three students and analyzed by consensus evaluation for use of "thinking tools" in text, illustrations, captions, exercises and activities, problem sets, and indexes. Total instances of pattern forming, analogizing, dimensional thinking, and modeling in each category were compiled and compared. A weighted value for each "tool" was produced according to the number of categories a tool appeared in. The data was also adjusted by dividing the number of uses of each tool (or its weighted value) by the number of pages evaluated. Results: Based on the preliminary tallies we expect that the use of analogizing and pattern forming in textbooks tends to decrease as the grade/age level increases while the use of dimensional thinking and modeling tends to increase with grade level.

SPATIOTEMPORAL GAIT CHARACTERISTICS OF TRANSITIONS IN HORSES
Rachel Wright
Location: Parlor A, 11:00 AM
Category: Agriculture and Animal Science, Oral
Mentor(s): Peter Aerts (Biological Sciences), Hilary Clayton (Large Animal Clinical Sciences), Sandra Nauwelaerts (Large Animal Clinical Sciences)
Gaits of quadrupedal animals are defined by the timing of their leg movements into three distinct gaits: walk, trot and canter. Walk and trot are symmetric gaits in which footfalls of the front and hind pairs are spaced evenly in time. Canter is an asymmetric gait in which footfalls of at least one pair are spaced unevenly. The objective is to evaluate spatiotemporal gait characteristics during the transition from trot to canter. Five miniature horses were outfitted with thirty-three reflective markers that were tracked by an eight camera motion analysis system in the strides before, during, and after the transition. Relative stance and stride duration, step and stride length, and duty factor were calculated and used to study the relationships between the contralateral and ipsilateral limbs and how the relationships change during the transition. Preliminary analysis suggests that the initiation of the transition is caused by extra elevation in the hind limb of the leading pair. This finding confirms the traditional viewpoint of Hildebrand that was recently challenged by Abourachid et al., whose theory predicted that any changes in locomotor patterns begin with the forelimbs.

DEVELOPMENT OF ZIPPER-ASSISTED CATALYSIS SYSTEM FACILITATING EXPRESSION AND PURIFICATION OF RECOMBINANT PROTEINS WITH POST-TRANSLATIONAL MODIFICATION

Xuemei Ye

Location: Gold Room, 1:30 PM - 3:30 PM

Category: Biochemistry and Molecular Biology-Section 2, Poster

Mentor(s): Min-Hao Kuo (Biochemistry and Molecular)

Most eukaryote proteins undergo post-translational modification (PTM) in biosynthesis. Frequently the biochemical and structural studies of such proteins are hindered by the lack of an efficient and versatile system that enables us to produce the interested proteins and their specific modifications. The zipper-assisted catalysis (ZAC) system has been developed as a means of solving this problem. Based on the high affinity and specificity of heterodimerization of leucine zipper domains, we fused the GSK-3B protein kinase (glycogen synthase kinase) to the Fos leucine zipper, and the microtubule-associating protein Tau to the Jun leucine zipper domain; both of these recombinant proteins were then expressed in E. coli. The concomitant expression of these proteins in E. coli resulted in efficient phosphorylation of Tau. We also demonstrate that the heterodimerizing capability of the Fos and Jun leucine zippers allowed co-purification of the Jun-Tau protein via affinity purification of the Fos-GSK-3B proteins. The proof-of-principle results presented herein will enable us to develop specific vector systems for other biologically and agriculturally important protein modifications. The ZAC system will be of tremendous interest to researchers in multiple fields.

JAPONISME IN WINSLOW HOMER'S GRAPHIC ILLUSTRATIONS

Janine Yorimoto

Location: Lake Huron Room, 10:00 AM

Category: Humanities and Peforming Arts-Section 1, Oral

Mentor(s): Phylis Floyd (Art and Art History)

This presentation explores the influence of Japanese art on Winslow Homer's early work, which is first apparent in his popular illustrations for 'Harper's Weekly.' My conclusion is that Homer's experience as a graphic illustrator, as well as the flexibility of the graphic medium, fostered the development of an original style incorporating aesthetic qualities adopted from Japanese art. Homer's personal interests suggest a natural affinity for Japanese aesthetics. For evidence, I look at some of the earliest writings available about Homer's life and art, his illustrations, and Japanese art that was accessible to Homer at the time. Homer later transferred his artistic skills and styles to painting, for which he is best remembered.

GRAPHICS BOOK PROJECT

Andrea Zagata

Location: Ballroom, 9:30 AM - 11:30 AM

Category: Communication Arts and Sciences, Poster

Mentor(s): Karl Gude (Journalism)

The Graphics Book Project was an effort to chronicle the best of Newspaper graphics from 1975-2005. It was also an introduction to the art of book design. Over the course of one summer, I researched the art of book design, looking at the work of others, especially Chip Kidd, for inspiration. The book needed a cover first in order to be pitched to possible publishers. I learned, through many iterations, to incorporate a graphic, title, and author into a comprehensive poster-like cover designed to interest readers as well as publishers. I also worked on inside pages, exploring ways to carry the design of the cover into typographic system throughout the book.

PROPRIOCEPTIVE STIMULATION OF THE HIND PASTERN IN WALKING HORSES

Lila Zarski

Location: Parlor A, 11:45 AM

Category: Agriculture and Animal Science, Oral

Mentor(s): Hilary Clayton (Large Animal Clinical Sciences), LeeAnn Kaiser (Large Animal Clinical Sciences), Narelle Stubbs (Large Animal Clinical Sciences)

Previous studies have shown that tactile stimulation of or the addition of weights to the hind pastern of trotting horses increases the flexion of the joints resulting in a higher flight arc of the hoof. As a continuation of these studies, we investigate and compare the effects of tactile stimulation versus weight added around the pastern on the flight arc of the hoof during the walk. The study used 7 Arabian horses. Devices were applied to both hindlimbs to either stimulate or add weight. Each horse was walked in-hand through 3 conditions: a lightweight tactile stimulator (55 g), a weighted strap (700 g), or neither (the control). The tactile stimulator consists of a strap placed around the pastern with 7 lightweight chain-links that hang over the hoof, and brush against the pastern and coronet. A weighted strap with no chains is attached around the pastern to increase the inertia. Using a motion analysis system, data were collected for a total of 15 trials per horse: 5 trials of each condition, in a randomized order. After data analysis, the maximal hoof height in the swing phase will be compared between conditions. This will allow us to compare the effects of tactile stimulation versus the inertial effect of additional weight on the flight arc of the hoof. This information will be applied in developing rehabilitation strategies that target an increase in range of motion of the joints.

SENSITIVITY OF SUGAR BEET (BETA VULGARIS L) TO TEMBOTRIONE AND MESOTRIONE

Nathaniel Zeitler

Location: Ballroom, 1:30 PM - 3:30 PM

Category: Agriculture and Animal Science, Poster

Mentor(s): Karen Renner (Crop and Soil Sciences)

Weed control is the number one production cost to cropping systems in the United States, with herbicides being used on 90% of farmland acres. Some herbicides are non-persistent in the soil due to rapid microbial degradation or hydrolysis, whereas other herbicides may persist in soils and injure sensitive crop species planted the following year. Extensive research has been done on the persistence of many classes of herbicides, however there is limited information on the persistence of the triketone class of herbicides, including tembotrione and mesotrione (sold under the trade names of Laudis® and Callisto®, respectively). To further the understanding of the persistence of these herbicides in soil

and the sensitivity of sugar beet, two experiments were conducted. In the initial experiment, titration curves were established to elucidate sugar beet sensitivity to these herbicides when grown in clay loam and sandy loam soils. Mesotrione was more injurious to sugar beets compared to tembotrione, and clay loam soils provided greater buffering capacity compared to sandy loam soils. Sugar beets were grown hydroponically in a second experiment to determine if the difference in sugar beet sensitivity is due to differences in sugar beet uptake and metabolism or to greater adsorption of mesotrione in soil. If tembotrione is more injurious than mesotrione in the hydroponic experiment, we will conclude soil adsorption is an important factor in reducing sugar beet sensitivity to tembotrione.

Faculty Mentors

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Gerry Adams, *Plant Biology*
Peter Aerts, *Biological Sciences*
Katherine Alaimo, *Food Science and Human Nutrition*
Robert Albers, *TISM*
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Richard Allison, *Plant Biology*
Eva Almenar, *Packaging*
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David Arnosti, *Biochemistry*
Cindy Arvidson, *Microbiology and Molecular Genetics*
Dennis Arvidson, *Microbiology*
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Yong-Hui Zheng, *Microbiology and Molecular Genetics*
Karin Zitzewitz, *Art and Art History*

Index of Presenters

Student participants are listed alphabetically by last name.

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MICHIGAN STATE UNIVERSITY

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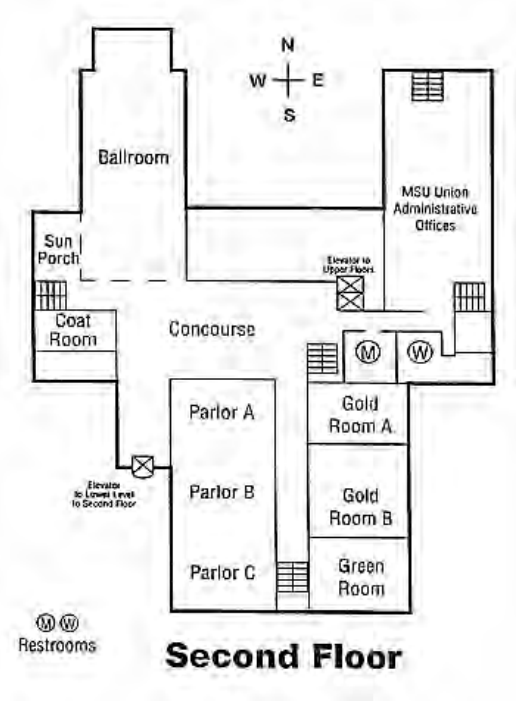
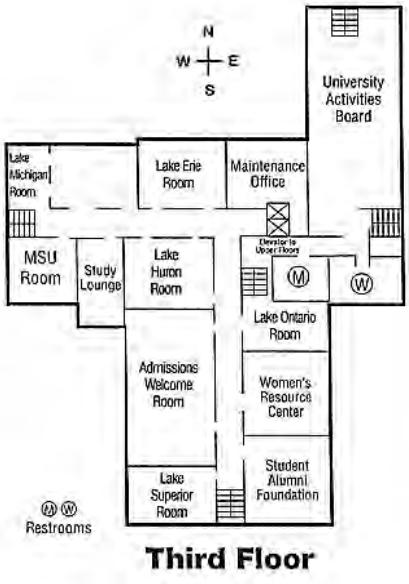
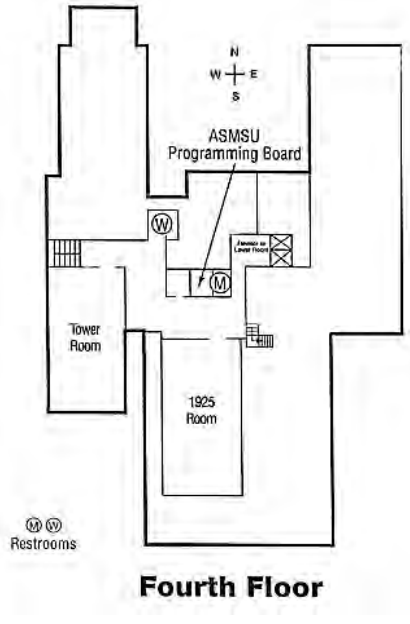
Red Cedar Image by J. Auchtung

Map of MSU Union







Note: The Tower Room, located on the 4th floor, is accessible only by the west staircase on the 3rd floor.