



UNIVERSITY
UNDERGRADUATE

**RESEARCH
& ARTS**

FORUM

Michigan State University
APRIL 16, 2009



Michigan State University
April 16, 2009

Welcome to the eleventh 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 615 students from 14 different colleges are participating in today's event—it is the largest student research forum in MSU history.

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—Lindsey Oehmen and Eric Jessup-Anger from the Associate Provost for Undergraduate Education's Office—for assisting with the coordination of this event and to the 50 staff members from across campus who volunteered their time to help make today run smoothly. Thank you.

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 to 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.

Table of Contents

Acknowledgements.....	2
Schedule of Events	4
Performance Demonstration Schedule	5
Oral Presentation Schedule	5
Poster Presentation Schedule.....	13
Abstracts	14
Faculty Mentors	90
Student Index.....	93
Map	125

2009 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	2 nd 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 Room A & B
Break to Reset Rooms for Afternoon Sessions 12:00 PM – 1:00 PM	
AFTERNOON REGISTRATION, 12:00 PM – 3:00 PM 12:00 PM – 12:30 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	2 nd 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 Room A & B
PERFORMANCE DEMONSTRATIONS, 1:00 PM – 3:30 PM 1:00 PM – 3:30 PM – Performances throughout afternoon	Parlor C
AWARD CEREMONY, 4:00 PM All UURAF participants, faculty, & guests are encouraged to return for the awards ceremony.	Parlors A,B, & C

Performance Demonstrations

Each performance demonstration is allotted 15 minutes and is followed by a 5 minute question and answer period. All Performance Demonstrations will be held in Parlor C.

TIME	PRESENTER(S)	TITLE
1:00 PM	Jeromy Hunt, Lauren Glinke, Daniel Kring, Jessie Neilson, Jordan Starks	PERFORMANCE GENEALOGY: ARTS THROUGH THE AGES
1:30 PM	Sigal Hemy, Borah Han, Laura Rasmussen	VARIATIONS ON AMERICA
2:00 PM	Megan Holycross	IN SEARCH OF THE ARTHROPHYCUS MAKER
2:30 PM	Nicolas Lira	<i>THE INFLUENCE OF SHAKUHACHI MUSIC ON MAI BY RYO NODA</i>
3:00 PM	Michelle Ryba, Mary McGorey, Krysta Michorczyk, Shayna Reedy	CHOREOGRAPHY AS RESEARCH-RESEARCH AS CHOREOGRAPHY

Oral Presentations

Each oral presentation is allotted 10 minutes followed by a 5 minute question and answer period. Each session has a faculty judge who is assisted by a room moderator who will monitor the times of each presentation. Participation and guests are asked not to enter or leave a room during a presentation.

Agriculture and Animal Science – Lake Huron Room

TIME	PRESENTER(S)	TITLE
1:00 PM	Lori Babcock	FIELD VALIDATION OF THE FISHXING MODEL
1:15 PM	Phillip Kurzeja	ARE ROOT PROBLEMS INVOLVED IN LEAF SCORCH?
1:30 PM	Katherine O'Connor	ANALYZING DIFFERENCES IN SADDLE PRESSURE IN EQUINES
1:45 PM	Natalie Cousin	MECHANICS TRANSITIONS IN HORSES
2:00 PM	Martha McCoy	FUNCTIONAL TRAITS UNDERLYING MATING SYSTEM EVOLUTION IN THE WILD RELATIVES OF RICE
2:15 PM	William Holdsworth	TOWARD MAP-BASED CLONING OF THE UNIFORM GRAY-GREEN GENE IN TOMATO
2:30 PM	Virginia Heinen	MIGRATORY RESTLESSNESS IN WILD-LIVING PASSERINES
2:45 PM	Kyla Amey	EFFECTIVE POPULATION SIZE IN THE LANDRACE BREED
3:00 PM	Lisa Parker	QUANTIFYING CARBON SEQUESTERED IN MSU-OWNED FORESTS

Cell Biology, Genetics, and Genomics – Lake Huron Room

TIME	PRESENTER(S)	TITLE
9:30 AM	Charlene Hopkins	FEMALE ATTRIBUTES CORRELATED WITH THE INCIDENCE OF MULTIPLE PATERNITY IN THE SNAPPING TURTLE (CHELYDRA SERPENTINA)
9:45 AM	Jacqueline Lapp	THE ROLE OF THE JUMONJIC-DOMAIN CONTAINING PROTEINS IN ARABIDOPSIS THALIANA
10:00 AM	James Poteracki, Karen Bates, Madison Chomsky, Shannon McCarthy, Zach Steffes, Andrew Worden	FUNCTIONAL MRI USING VASCULAR SPACE OCCUPANCY (VASO) AND VASCULAR SPACE OCCUPANCY WITH TISSUE SUPPRESSION (VAST)
10:15 AM	Lawrence Lee	HAPLOTYPE ANALYSIS OF THE OTOF GENE REGION AS A POSSIBLE CAUSE OF DEAFNESS IN AN INDIVIDUAL
10:30 AM	Angela Shrestha	GENETIC MAPPING OF A GENE CONTROLLING FLOWERING IN PLANTS
10:45 AM	Xiaozhou Liu	CIS REGULATORY GRAMMAR AND SYSTEMS BIOLOGY
11:00 AM	Virginia Cook	EXPRESSION OF ATP BINDING CASSETTE TRANSPORTERS IN CANINE OSTEOSARCOMAS
11:15 AM	Alexander Brown	COMPARING AP-1 AND ETS ACTIVATION LEVELS IN MAMMARY CELLS TRANSFORMED WITH THE MIDDLE T ONCOPROTEIN AND KEY MUTANTS
11:30 AM	Christopher Sinkler	CHARACTERIZATION OF THE GUN201 GENE FAMILY, A NOVEL DOMAIN INVOLVED IN PLASTID SIGNALING IN ARABIDOPSIS THALIANA
11:45 AM	Edita Klimyte	ALTERNATIVE HYPOTHESIS CONCERNING HUMAN DISEASE AND MODELS OF COMPENSATORY EVOLUTION IN TRNAS VIA EXPERIMENTS IN SACCHAROMYCES CEREVISIAE
12:00 PM	Joshua Bilsborrow	DKR: ENHANCED CONVERSION OF ALPHA-ARYLALANINES TO BETA-ARYLALANINES VIA COUPLED RACEMASE-PAM REACTION
12:15 PM	Andrew Riedy	MUTATIONAL EFFECTS OF MYOSIN 15A: THE CORRELATION OF MYOSIN 15A AND HEARING LOSS

Communication Arts and Sciences – Lake Superior Room

Group 1

TIME	PRESENTER(S)	TITLE
9:30 AM	Jennifer Kudsin	LONG-TERM IMPACT OF AN OVERSEAS STUDY PROGRAM
9:45 AM	Matt Ortlieb	MY LONDON
10:00 AM	John Lauckner	THE WRITING CENTER AND DIGITAL LITERACIES
10:15 AM	Kristin Wild, Mallory Root	FARE CHANCE
10:30 AM	Ellen Meeuwsen, Erin Campbell, Jeremy Davis, Brittany Diamantoni, Katie Guikema	EVOLUTION FOR EVERYONE
10:45 AM	Valerie Inwald	ANXIETY AND ACHIEVEMENT: INVESTIGATING THE IMPACT OF TEST ANXIETY ON COLLEGE-LEVEL STUDENTS
11:00 AM	Michelle Crechiolo, David Dowgiell, Reed Kalso, Kate Kolenda	ENTERTAINMENT AND CULTURE IN JAPAN AND ZAMBIA
11:15 AM	Kristen Daum, Adrian Kikes, Jenni Lewis, Meredith Skrzypczak, Nicquel Terry	DIVERSITY OF ETHNICITY IN ENTERTAINMENT AND CULTURE BETWEEN THE UNITED STATES AND JAPAN
11:30 AM	Jessica Lipowski, Jennifer Orlando	ARABS, JEWS AND THE NEWS DOCUMENTARY

Group 2

1:00 PM	Adam Rademacher	A NEW GREEN ECONOMY
1:15 PM	Elizabeth Marzotto, Alexandra Ghaly, Julie Miannecki, Amanda Peterka	STEEL: HOT METAL, COLD REALITY
1:30 PM	Bert Wierenga, Marie Lazar, Patrick Mussell, Andrea Pollitt	JURRASIC COMMANDER POSTMORTEM
1:45 PM	Matthew Bambach, Alex Hatch, Jason Maynard	UTILIZING AUTODESK MAYA 2008 TO CREATE AN IMMERSIVE THREE-DIMENSIONAL EXPERIENCE FOR A THEATRICAL SETTING
2:00 PM	Alisha Green	USING MULTIMEDIA TO ASSIST FARMERS IN INTERACTIONS WITH THE THAI COMMUNITY THROUGH THE WEB SITE SUSTAINABLE FARMER
2:15 PM	Kelly House, Kyle Feldscher, Justin Harris, Marilyn King, Cash Kruth	GLOBALIZATION AND THE MEXICAN PRESS
2:30 PM	Jenni Lewis	CREATING MEDIA MESSAGES TO INCREASE ASIAN IMMIGRANT ACCESS TO HEALTHCARE IN METRO DETROIT
2:45 PM	Andrew Wildbill	AMERICAN INDIAN'S IN POPULAR CULTURE
3:00 PM	Andrea Pollitt, Mathew Mason, Daniel Shillair, Bruno Sommer	SPHERE - AN EXPERIMENT IN SIMPLIFYING GAMEPLAY,SCOPE AND CONTROLS IN VIDEO GAMES TO FACILITATE GREATER PLAYER IMMERSION

Digital Media – Tower Room

TIME	PRESENTER(S)	TITLE
9:30 AM	Nicholas Tootalian, Ryan Hurst, Michael Lippett, Collin Porteus, Taylor Smith	THE MATTRESS SOURCE
9:45 AM	Brad Corlett	ELDERLY INSTRUMENTS DOCUMENTARY
10:00 AM	Stephanie Sparks, Joshua Barnett, Gregg Gaddy, Rachel Hartman	COCKNEY RHYMING SLANG
10:15 AM	David Cooper, Brianna Gardner	MSU TELECASTERS THE SHOW
10:30 AM	Carolyn Baldwin, Brad Corlett	REDUCE, REUSE, BE SPARTAN GREEN
10:45 AM	Nick Schultz	SIDESHOW
11:00 AM	Anson Mulville	MSU&U
11:15 AM	Andrew Vallentine, Nick Constantine, Peter Corriveau, Carly Ludtke	HIGH STEP: A STORY OF THE SPARTAN MARCHING BAND
11:30 AM	James Semivan	WIND POWER
11:45 AM	Stephanie Sparks, Joshua Barnett, Rachel Hartman, Thomas Reilly-King	MEANTIME
12:00 PM	David Cooper	BOOK TRAILER: ASSASSINATION VACATION BY SARAH VOWELL

Environmental and Natural Resources – Parlor B

TIME	PRESENTER(S)	TITLE
9:30 AM	Kaitlin Lonc	EFFECTS OF URBANIZATION AND HUMAN ACTIVITY ON SCIURUS CAROLINENSIS BEHAVIOR: CASE STUDY AT MICHIGAN STATE UNIVERSITY
9:45 AM	Shannon Morey	BOTANICAL INSECTICIDE PERSISTENCE STUDIES
10:00 AM	David Stringer	CHANGES IN LAKE PRODUCTIVITY THROUGH SEDIMENT CHRONOLOGIES
10:15 AM	Jason Fischer	SPINE INDUCTION OF THE SPINY WATER FLEA (BYTHOTREPHES LONGIMANUS)
10:30 AM	J. Cory Connolly	RENEWABLE ENERGY FOR MICHIGAN SCHOOLS
10:45 AM	Mary Hingst	IDENTIFYING HISTORICAL STATES OF BALANCE (STEADY STATE/EQUILIBRIUM) IN LAKES USING SEDIMENT CHRONOLOGIES OF REDOX-SENSITIVE METALS
11:00 AM	Sam Rossman	HISTORICAL DECLINES IN SEAGRASS ABUNDANCE REVEALED THROUGH BOTTLENOSE DOLPHIN STABLE ISOTOPE ANALYSIS

Environmental and Natural Resources – Parlor B

(Continued)

TIME	PRESENTER(S)	TITLE
11:15 AM	Leigh Anna Beach	MANAGEMENT OF RESIDENTIAL NATURAL RESOURCES BY RECENT RURAL IN-MIGRANTS
11:30 AM	Megan Shavalier	SHEDDING AND PERSISTENCE OF VIRAL HEMORRHAGIC SEPTICEMIA VIRUS IN SURVIVING FISH
11:45 AM	Elizabeth Huber, Benjamin Winger	DEVELOPMENT OF ANTIMICROBIAL FILMS BASED ON PLA WITH IMPLICATIONS FOR FOOD PACKAGING
12:00 PM	Brittany Murphy	HABITAT QUALITY AFFECTS RATES OF GENE FLOW IN SOUTH-CENTRAL MICHIGAN WHITE-TAILED DEER

Health, Food and Wellness – Parlor C

TIME	PRESENTER(S)	TITLE
9:30 AM	Marleah Dean	CONTENT ANALYSIS OF BREAST CANCER WEBSITES
9:45 AM	Kelly Mattran	PHYSICAL ACTIVITY DURING PREGNANCY AND OFFSPRING SIZE (PAPOS): BODY COMPOSITION AT 18-24 MONTHS
10:00 AM	Daniel Miller	COMPARISON OF ECONOMY IN OVER-GROUND VERSUS TREADMILL WALKING IN CHILDREN AND ADOLESCENTS
10:15 AM	Ellen Mang, Caitlin Fisher, Stephanie Gorte, Leah Simpson, Meaghan Snowdin	UNDERSTANDING KEY COMPONENTS OF NUTRITION ENVIRONMENTS, POLICIES AND PROGRAMS IN SCHOOLS AND THEIR IMPACT ON STUDENTS DIETS
10:30 AM	Sarah Bartholomew	PHYSICAL ACTIVITY DURING PREGNANCY AND CHILD BODY SIZE AT 8-10 YEARS
10:45 AM	Tuan Nguyen	ALOE VERA-CHITOSAN BLEND AS A NEW EDIBLE COATING FOR IMPROVING THE SHELF-LIFE OF STRAWBERRY (FRAGARIA X ANANASSA) DURING REFRIGERATED STORAGE

Humanities & Performing Arts – Parlor A

Group 1

TIME	PRESENTER(S)	TITLE
9:30 AM	Julia Allen, Michael Lala	CREATIVE WRITING: WRITING CENTERS- WORKSHOPPING IN NEW WAYS
9:45 AM	Amanda Tanner, Chelsea Beck, Anna Pathak, Alexandra Siciliano	THE ESSENCE OF IMAGES
10:00 AM	Alexander Paris, Danielle Campbell, Deanna Domino	WARHOL: A CRITICAL ANALYSIS
10:15 AM	Laura Jensen	HOW DO ENGLISH SPEAKERS LEARNING FRENCH MAKE TU-VOUS DECISIONS?
10:30 AM	Jennifer Strack	PIN-UP ART FROM THE 1940'S AND 50'S
10:45 AM	Sunny Ching, Hui Wang	THE NEW IN THE OLD: STEPHEN BERKMAN
11:00 AM	Seth Morton	UNCERTAINTY PRINCIPLES: THE CHANGING DYNAMICS OF NARRATIVE AND THEORY IN THE 21ST CENTURY

Humanities & Performing Arts – Parlor A
(Continued)

Group 2

TIME	PRESENTER(S)	TITLE
1:00 PM	Jonathan Beagley	LINGUISTIC VARIATION OF THE POSITION OF OBJECT PRONOUNS IN SOUTHERN FRENCH
1:15 PM	Joseph Sbar	READING BETWEEN THE LIONS: EXPLAINING CONTINUOUS NARRATIVE IN THE LION HUNT RELIEFS FROM THE PALACE OF ASHURBANIPAL
1:30 PM	Dustin Burden	BODY THEORY, A COLLECTION OF CRITICAL AND CREATIVE RESOURCES
1:45 PM	Katherine Hedrick	ANALYZING AND TEACHING GLBT YOUNG ADULT LITERATURE FROM A QUEER PERSPECTIVE IN THE SECONDARY CLASSROOM
2:00 PM	Jessica McLean	THE SELECTION OR EXCLUSION OF THE GOLDEN COMPASS BOOKS IN SECONDARY ENGLISH CLASSES

Social Science: General – Green Room

Group 1

TIME	PRESENTER(S)	TITLE
9:30 AM	Julia Lyskawa	FROM GENERATION GI TO GENERATION Y: THE NEEDS OF RELATIVE CAREGIVERS BY AGE
9:45 AM	August Evrard, Malcom Doering, Katie Fraser, Samatha Giuffre	I PROBABLY WOULD PUT PROBABLY SECOND: PRE-AUXILIARY ADVERBS IN AMERICAN ENGLISH
10:00 AM	Kayla Jelinek, Landon Ginsberg, Emily Kramer	DIRECT-TO-CONSUMER ADVERTISING OF GARDASIL
10:15 AM	Megan O'Brien	SQUATTER SETTLEMENTS IN LATIN AMERICA: SANTA ELENA, VENEZUELA AND LIMA, PERU
10:30 AM	Kellie Owens	LIFE (UN)WORTH LIVING: ETHICAL IMPLICATIONS OF PRENATAL SCREENING
10:45 AM	Doug Schraufnagle	EXPLORING THE MICHIGAN STATE UNIVERSITY ISRAELITE SAMARITAN SCROLL COLLECTION: TRANSCULTURATION AND THE INTERNATIONAL SUNDAY SCHOOL CONVENTIONS
11:00 AM	Jacqueline LaRouere	PSYCHOLOGICAL CARE FOR RAPE VICTIMS IN AFRICAN CONFLICT SITUATIONS

Social Science: General – Green Room

(Continued)

Group 2

TIME	PRESENTER(S)	TITLE
1:00 PM	Jennifer White	ASSESSING THE ACCESS TO HEALTHCARE: THE AFRICAN-AMERICAN INFANT MORTALITY RATE
1:15 PM	Veronica Roth	ADULT STUDENTS AND COMPUTER SKILLS IN MID-MICHIGAN
1:30 PM	Nicole Iaquinto	AFRICA'S LATE DECOLONIZING TRANSITIONS: SOUTH AFRICA'S ANC AND NAMIBIA'S SWAPO
1:45 PM	Maria Lockhart	IN SEARCH OF GEOGRAPHIC RACIAL EQUALITY IN METRO-DETROIT
2:00 PM	Yvette Efevbera	WHAT'S HAPPENING TO UGANDA'S CHILDREN? THE EFFECTS OF WAR ON YOUTH CULTURE IN NORTHERN UGANDA
2:15 PM	Ramya Narahariseti	EMPOWERMENT, LEADERSHIP, AND INTERGENERATIONAL DYNAMICS AMONG YOUNG WOMEN IN RURAL SOUTH AFRICA
2:30 PM	Elizabeth Velliky	PEOPLES' PARK: ARCHAEOLOGY AT MSU

Social Science: History, Economics, and Political Science – Lake Erie Room

Group 1

TIME	PRESENTER(S)	TITLE
9:30 AM	Matthew Murray	REGIME CHANGE IN TRIPOLI
9:45 AM	Patrice Johnson	BREAKING THE CHAINS OF GENERATIONAL CURSES: A HISTORICAL ANALYSIS OF THE BLACK FAMILY
10:00 AM	Danielle Ferry	UNIVERSITY-INDUSTRY LINKAGES: A TAXONOMY
10:15 AM	Alexandra Albers	CHANGES IN EDUCATION AND ATTITUDE: A POST-CONFLICT LOOK AT IRELAND'S BORDER REGION
10:30 AM	Robert Siporin	THE SYMBOLIC AND REALISTIC POSSIBILITIES OF BARACK OBAMA'S PRESIDENCY
10:45 AM	Ryan Etzcorn	THE STING OF ASIA'S 'GRANARY': ADMINISTRATIVE AND ECONOMIC INCONGRUENCIES WITH THE ENVIRONMENT IN JAPANESE MANCHURIA
11:00 AM	Bianca Willis	ENSLAVED WOMEN'S SEXUALITY
11:15 AM	Jeremy Blaney, Krystle Forbes, Matt Harris	THROUGH THE MEDIAS LENS REPRESENTING THE 2003 IRAQ WAR

Social Science: History, Economics, and Political Science – Lake Erie Room

(Continued)

Group 2

TIME	PRESENTER(S)	TITLE
1:00 PM	Mark Kelly	"AND THE PARTY OF FREEDOM IS WAKING...": THE FORMATION OF THE WISCONSIN REPUBLICAN PARTY IN 1854
1:15 PM	Tanya Rodriguez	EDUCATION AND RECONCILIATION IN NORTHERN IRELAND
1:30 PM	Sneha Goud	TRACEABILITY IN THE US VS EU FOOD CHAIN AND ITS IMPACT AT MICHIGAN STATE UNIVERSITY
1:45 PM	Brian Riedy	THE MUSLIM BROTHERHOOD AND EGYPTIAN POLITICS
2:00 PM	Anupama Prasad, Andrew Bristle	THE IMPLICATIONS OF ELIMINATING THE PROPERTY TAX
2:15 PM	Shawn Gillingham	MICHIGAN POLICY NETWORK

Social Sciences: Psychology – Tower Room

TIME	PRESENTER(S)	TITLE
1:00 PM	Steven Cox, Sarah Maki, Nicole Van De Velde	FUNCTIONAL ANATOMY OF READING STORIES VERSUS SOLVING MATH PROBLEMS USING FMRI
1:15 PM	Meredith Derian-Toth, Carrie Eby, Carrie Louis, Courtney Ochalek, Ashley Schurig	EQUAL PAY FOR EQUAL PLAY: DEVELOPMENTAL CHANGE IN YOUNG CHILDRENS FAIRNESS CONCERNS AND COOPERATION
1:30 PM	Mallorie Leinenger	COMPREHENSION AND RETENTION OF DIFFERENT TEXT TYPES ACROSS LANGUAGES
1:45 PM	Adam Stivers	SOCIAL EXCLUSION AND SOCIAL DILEMMAS
2:00 PM	Sara Cottrill	PREDICTORS OF HIV-RISK BEHAVIOR AMONG YOUNG MEN WHO HAVE SEX WITH MEN IN DETROIT
2:15 PM	Bradley Lawrence	PUBERTAL DEVELOPMENT OF THE SEXUAL DOPAMINERGIC SYSTEM IN MALE HAMSTERS

Poster Presentations

All poster presentations will be displayed in the Ballroom and the Gold Room.

Morning Poster Displays

9:30 AM -11:30 AM

Location: Ballroom	Location: Gold Room
Biochemistry & Molecular Biology - Group 1	Agriculture & Animal Sciences - Group 1
Cell Biology, Genetics & Genomics - Group 1	Education
Cell Biology, Genetics & Genomics - Group 2	Environmental Sciences & Natural Resources - Group 1
Communication Arts & Sciences - Group 1	Humanities
Math, Computer Science & Engineering - Group 1	Physical Science - Group 1
Microbiology, Immunology, & Infectious Disease - Group 1	Social Science: Psychology - Group 1
Social Science: General - Group 1	
Social Science: History, Economics & Political Science	

Afternoon Poster Displays

1:30 PM – 3:30 PM

Location: Ballroom	Location: Gold Room
Cell Biology, Genetics & Genomics - Group 3	Agriculture & Animal Sciences - Group 2
Communication Arts & Sciences - Group 2	Biochemistry & Molecular Biology - Group 2
Communication Arts & Sciences - Group 3	Environmental Science & Natural Resources - Group 2
Health, Food & Wellness	Physical Science - Group 2
Math, Computer Science & Engineering - Group 2	Social Science: General - Group 2
Math, Computer Science & Engineering - Group 3	Social Science: Psychology - Group 2
Microbiology, Immunology, & Infectious Disease - Group 2	
Microbiology, Immunology, & Infectious Disease - Group 3	

Abstracts

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

THE ROLE OF *NGO0516-17* IN *NEISSERIA GONORRHOEAE* IN CELL SURVIVAL IN RESPONSE TO EXTRACELLULAR STRESSORS

Christine Acho

Mentor(s): Cindy Arvidson (Microbiology and Molecular Genetic)

The focus of this work has been to phenotype the gene locus *NGO0516-17* in the human pathogen *Neisseria gonorrhoeae*. These genes are hypothesized to encode for a toxin-antitoxin system. Bacterial toxin-antitoxin systems are believed to play a role in bacterial response and survival to extracellular stressors. In order to test this hypothesis, a mutant strain, MS11 Δ 516-17, was constructed from the wild type laboratory strain, MS11. MS11 Δ 516-17 has a TnErM insertion in the first transcribed gene of the *NGO0516-17* locus, and the insertion is polar to the downstream gene. The sensitivities of MS11 and MS11 Δ 516-17 strains were quantified for their response to environmental stressors including: NaCl (0.3M, 0.6M, 0.9M), pH (5.85, 6.32, 7.2, 8.52), H₂O₂ (10mM, 20mM, 30mM, 40mM, 50mM), and selected antibiotics. This was carried out by incubating MS11 and MS11 Δ 516-17 with varying concentrations of the stressors for a limited time and then plating onto culture medium. Thus far, it has been determined both MS11 and MS11 Δ 516-17 are equal in sensitivity to NaCl and pH stresses, indicating *NGO0516-17* has no effect on cellular survival in response to these stresses. However, a difference in sensitivity was noted in regards to H₂O₂. MS11 demonstrated a greater survival than MS11 Δ 516-17 over a range of H₂O₂ concentrations suggesting that *NGO0516-17* plays a role in survival in response to oxidative stress. We are at present examining the response of these strains to the antibiotics tetracycline, penicillin and ciprofloxacin to test the hypothesis that toxin-antitoxin systems protect against antibiotic stress.

INVESTIGATING THE PRESENCE OF A BACTERIAL ENDOSYMBIONT IN THE NEMATODE *TRICHURIS MURIS*

Alexander Adrian

Mentor(s): Linda Mansfield (Large Animal Clinical Sciences)

Inflammatory Bowel Disease (IBD) is a serious chronic intestinal inflammatory autoimmune disorder. The two commonly recognized forms, ulcerative colitis and Crohn's disease, afflict 6/100,000 adults in the US, as well as an unknown number of feline and canine patients. Current treatments often have a risk of side effects, and are rarely effective long term. Recently, deliberate infection with *Trichuris* has worked successfully to treat IBD patients. We hypothesize that *Trichuris* harbors the endosymbiotic bacteria *Wolbachia*, a genus known to modulate host immune response. This genera infects a variety of other nematode species such as *Dirofilaria immitis* and *Onchocerca volvulus*. We collected *Trichuris muris* eggs and adult worms, sterilized the outside surface, extracted DNA and tested for sequences specific to the 16S universal bacterial region. Results indicate presence of bacteria in both eggs and adult worms. Sterile eggs were processed for transmission electron microscopy (TEM). Furthermore, we sequenced the 16S bacterial PCR product to identify the bacterial species detected in worm DNA. Confirmation of *Wolbachia* would aid in describing the mechanism of action for *Trichuris* mediated therapy.

EXPLORING ANTS UNDER THE SEM

Afiqah Ahmad Hisham

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

This project explores ants that are commonly found indoors. The ants have been conductively coated and examined under the Scanning Electron Microscope (SEM) to provide close-up images of ants that can't easily be seen with the naked eyes.

CHANGES IN EDUCATION AND ATTITUDE: A POST-CONFLICT LOOK AT IRELAND'S BORDER REGION

Alexandra Albers

Mentor(s): Carole Robinson (Bailey Scholars Program)

In the summer of 2008, I traveled with a study abroad program to the parish of Truagh in County Monaghan, Ireland. There, I had the opportunity to interview a number of residents including, but not limited to, teachers, development workers, and politicians. These interviewees have lived and worked along the Irish border, making them acutely aware of the specific social and economic challenges faced by the border populations during and after the Irish 'Troubles'. I focused my research simultaneously on various educational programs recently implemented in the area, as well as on any changes in the attitudes and outlook of the residents of Truagh and the surrounding region. From my research and interviews, I was able to discern a change in the resident's attitudes from one of close-mindedness and fear to one of openness and understanding as a result of these changes in education.

WHAT IS THE EPISTEMOLOGY OF ANCIENT ORNITHIACA: HOW DO WE KNOW WHAT WE KNOW ABOUT ANCIENT BIRDS?

Tamar Aldrich

Mentor(s): Susan Madigan McComb (Art & Art History)

What is the Epistemology of ancient Ornithiaca: How do we know what we know about ancient birds? This poster is based on the analysis of research of images and texts that pertain to birds. This information spans two millennia as we move from the origins of Aristotle's *Historia Animalium* and the *Physiologus* to current photographs reflective of bird images of today. Ancient images are gathered from a variety of sources including ancient Greek texts like the *Vienna Dioscurides*, *The Vatican Chigi F. VII. 159. of Rome Italy*, and *The Aberdeen Bestiary's*. Connections between the various authors: Aristotle, Dionysius of Philadelphia, Pliny the Elder, Isidore of Seville, and Zoltan Kadar, are demonstrated as we investigate the origin, nature, methods, and limits of human knowledge of birds.

CREATIVE WRITING: WRITING CENTERS- WORKSHOPPING IN NEW WAYS

Julia Allen, Michael Lala

Mentor(s): Trixie Smith (Michigan State University Writing Center)

This project investigated which teaching techniques employed in creative-writing-based, group collaboration are most effective in helping creative writers and how to transfer the benefits and techniques used by writers in creative writing workshop environments to one-on-one consultations conducted at writing centers, including the MSU Writing Center. Research methodology included using surveys and interviewing MSU writing consultants and creative writers, while training consultants in different creative writing techniques. It also involved the implementation of creative writing workshops run and supported by the MSU Writing Center as a way of discovering the benefits found in a collaborative environment. Benefits discovered include an insight into different reader interpretations, having others look at their writing in a holistic way, and learning different styles of

writing from others in their workshopping groups. These benefits can also be translated into writing center consultations with added benefits. By learning which techniques discussed and employed in workshop environments were effective, the researchers were able to better train new writing center consultants in how to effectively consult for creative writers by building knowledge-base about creative writing techniques and relating sessions to traditional academic consultations. The sum of this research amounts to the advancement of a new literacy that can be found in writing centers, expanding writing center pedagogy, and creating a welcoming environment to a large number of writers found in the Michigan State and broader university community, allowing the writing center ways of supplementing, strengthening, and expanding academic learning.

INERTIAL PROPERTIES OF BODY SEGMENTS OF THE HORSE, EQUUS CABBALUS

Whitney Allen

Mentor(s): Hilary Clayton (Large Animal Clinical Sciences), Sandra Nauwelaerts (Large Animal Clinical Sciences)

Knowledge of the inertial parameters of body segments of the horse is essential for the understanding of equine kinetics. Most studies use a restricted cadaver database to create regression models, while other studies failed in their attempt to use geometrical models to estimate shape and inertial parameters. Our study is developing a method to determine individual inertial parameters as accurate as possible. The objective is to increase the size and diversity of the database on inertial properties. We are using data from twenty horses of different ages (2 days old up to 25 years old) and different breeds (Standardbred, Thoroughbred, Arabian, Clydesdale, Quarterhorse, Trakehner, Haflinger, Appaloosa) and comparing three methods for calculating the moments of inertia: (1) measurements using a trifilar pendulum, (2) geometric estimates based on two perpendicular pictures assuming uniform density and (3) regression models based on scaling factors for different breeds. When using method 1 and 2 on dummy segments, cylinders for which the moment of inertia (MOI) can be calculated, both methods show a slight overestimation. When applying the three methods on cadaver segments, the picture method overestimates in comparison to the pendulum method. Data based on previously reported scaling exponents (Buchner et al., 1997) compares poorly to the other methods. Our aim is to develop an accurate method to obtain inertial parameters that will enable us to fine-tune our 3D musculoskeletal virtual model to the individual horse's proportions. This will dramatically increase the reliability of dynamic analyses of horse locomotion.

WHAT KINDS OF INFORMATION DO CHILDREN SHARE WITH OTHERS?

Reem Alzhabi, Megan Bissett

Mentor(s): Judith Danovitch (Psychology)

Although much research has been done showing that children go to different types of people when they have inquiries that they believe can be better answered by one person compared to another, our research in this study looks into the opposite situation. When a child has information concerning a certain phenomenon, do they share different pieces of information with people that have different motives or people who are simply naive about a topic? For example, do they realize that an animal caretaker would want to know different things about an animal than would a person who makes pictures of the animals? Children in kindergarten, second grade, and fourth grade will participate in the study. They will be provided with a series of two facts about unusual animals and will be asked to share one of the pieces of information with both an animal caretaker and a person who makes pictures of the animals. We hypothesize that as children develop and grow older, they will be able to better assess the motives of other people, and consequently, share appropriate pieces of information with them. Data is currently being collected, and once completed, results will reveal information as to how children's cognitive processes develop and will illustrate children's capacity to understand what others are thinking.

EFFECTIVE POPULATION SIZE IN THE LANDRACE BREED

Kyla Amey

Mentor(s): Ronald Bates (Animal Science)

Within livestock populations, an increased rate of inbreeding can cause certain traits, such as fertility and fitness, to become impaired. The genetic diversity of a population, as well as the relationship of the parents in that population, relate directly to the rate of inbreeding. A means to describe the genetic diversity in a population is called the effective population size, which is an idealized number of individuals that can contribute genes equally to the next generation. The objective of this study was to estimate the effective population size of the Landrace breed in the United States. The recorded Landrace ancestry, which contained 815,840 registered individuals, was obtained from the National Swine Registry, West Lafayette, IN. This pedigree consisted of individuals into the 27th generation and 3,024 founder individuals. A founder was defined as an individual with no known sire and dam identification. Across the Landrace population the average relatedness between individuals was 2.88% with an average inbreeding coefficient of 6.43%. The estimated effective population size for the Landrace breed in the United States was 165. An effective population size of this magnitude implies an idealized rate of inbreeding of 0.3% per generation. This suggests that the Landrace breed can maintain a low rate of inbreeding in immediate future generations.

IDENTIFICATION OF RESIDUES ESSENTIAL FOR DNA LYASE ACTIVITY SPECIFIC TO ABASIC SITES IN HUMAN ABH1

Megan Andrzejak

Mentor(s): Bob Hausinger (Microbiology and Molecular Genetics CNS), Tina Muller (Microbiology and Molecular Genetics)

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. ABH1, closest in sequence to AlkB, also catalyzes the unanticipated cleavage of DNA containing abasic sites. The goal of the experiments described here was to identify critical residues of the protein that are responsible for binding to abasic sites in DNA and lyase activity. A series of mutant forms of ABH1 was created in which carefully selected amino acid residues were altered. These mutations were chosen by comparison of the sequences of AlkB and ABH1 from diverse organisms, using conserved portions of the sequences and emphasizing Lys side chains that are often critical for lyases. Site-directed mutagenesis using specific primers was carried out in order to incorporate the desired mutations into the sequence. The variant forms of ABH1 were over-expressed in E. coli DH5 α cells, cell extracts were obtained, and the proteins were purified by using a Ni-NTA Sepharose column. The purified proteins were subjected to DNA binding and lyase activity assays to determine whether the mutations affected the binding and/or cleavage of DNA containing abasic sites. The seven mutations initially chosen for study exhibited little or no effect on binding or activity; however, the results of additional mutations will be described.

CRE-1 BINDING PROTEIN IS A POTENTIAL TARGET FOR CONTROLLING AFLATOXIN CONTAMINATION IN FOOD CROPS

Katherine Artymovich

Mentor(s): John Linz (Food Science & Human Nutrition Ag & Nat Res), Ludmila Roze (Food Science & Human Nutrition Ag & Nat Res)

Aflatoxin is a highly carcinogenic secondary metabolite produced by the fungus, Aspergillus spp.. It is found on crops, such as oilseeds and tree nuts. The goal of our research is to study the metabolic pathway of aflatoxin, and develop new methods that will reduce or eliminate the amount of contamination

on crops. Recently, a protein ~34 kDa in size, cAMP response element-1 binding protein (CRE1bp), was found to bind to an eight nucleotide DNA sequence, cAMP response element-1 (CRE-1), in the *nor-1* promoter in the *A. parasiticus* aflatoxin gene cluster. In order to identify CRE1bp, we recently identified a single gene designated 92.m03394 encoding a bZIP basic transcription factor on chromosome V that is unique to *Aspergilli*. The protein is 319 amino acids and 35.9 kDa in size. We created two peptide antigens specific for this protein and performed Western Blot analysis on a wild type strain, Su-1 which produces aflatoxin, and a mutant strain, veA- which does not produce aflatoxin. The antibodies for two peptides recognized a protein represented by an intense band that was ~45 kDa in size and a weak band of ~35 kDa. The accumulation of the ~45 kDa band appeared at 30 hours in Su-1 and at 40 hours in veA-. The expression of the ~45 kDa band was delayed in veA-. We are interested in this ~45 kDa protein, and will do follow-up studies focused on identifying the peptide sequence and function.

OPTIMIZING WAYFINDING IN TRANSIT CENTERS

Claire Audette-Bauman

Mentor(s): Constantinos Coursaris (Telecommunications)

Due to our innate mobility, wayfinding is often depicted as one of the earliest human activities. In simple environments, “the human mind is capable of generating a cognitive map or the internal spatial representation of environmental information” (Wang, Hedgecock, Fernández). This information, connected with traditional strategies, is long outdated due to new age technologies and necessities. What elements have the greatest effect on successful wayfinding in transit centers? Our hypothesis is that environmental elements influence an individual’s performance and ability to successfully locate their goal more effectively than the memorization of layouts. This experiment will be conducted to measure and clarify what information (environmental factors and signs) people utilize during wayfinding in an interior space and also in a simulated space. There will be two experimental units and a control group; one unit will navigate using signage, the other environmental elements, and the control group by means of memory. After physically completing the routes, the groups then are tested using a simulated version with more complex pathways. Upon conclusion, a survey will be conducted asking questions regarding the methods used for wayfinding. The subjects will be measured by the time taken to complete the tasks, the number of errors made, and the participants’ feedback measuring their experience. Due to the unfamiliarity of the environment, greater perceptual attention for surrounding cues is needed for successful wayfinding, demonstrating the repetition of various environmental elements is essential for wayfinding, especially in crowded, busy, transit centers.

FIELD VALIDATION OF THE FISHXING MODEL

Lori Babcock

Mentor(s): Matt Blank (Western Transportation Institute), Joel Cahoon (Civil Engineering)

The FishXing program is a widely used model for estimating the likelihood of different fish species to pass through culvert crossings. Until this point, no studies have thoroughly focused on validating its accuracy. In this study we developed calibration curves for 46 previously analyzed culvert sites and gathered hydraulic data for validating the model through 10 new culvert sites in southwest Montana. Calibration was based on running the program with all hydraulic data constant except for the roughness coefficient, or Manning’s *n*, which we increased by .01 intervals from .01 to .07. This yielded different water depth predictions, which were analyzed for percent depth error. The Manning’s *n* with the lowest error was chosen as the calibrated value necessary for use in FishXing, and conclusions with regards to the general accuracy of the FishXing V2 and V3 were made. It was found that V3, the latest version of FishXing, usually produced more accurate results than V2. Problems with the accuracy of the model were found to be mostly because of the one-dimensional nature of the program. Not all sites are good candidates for the FishXing program because woody debris, rocks and other in-stream objects near and within the culvert can create complex hydraulic conditions that are difficult to predict using 1-D models. Every site is different and must be calibrated and analyzed accordingly for validation of the model.

THE USE OF COLOR AS AN IMPLICIT RESTRICTION IN CHILD’S LANGUAGE

Brittany Baker, Lydia Oehring, Alanna Thiede

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

By the age of five, we have acquired our first language, but this process is still full of mystery. One of the many things that need to be learned is what the definite article “the” means. Given an array of three trees next to a house, previous experiments showed that children, when asked to point to “the tree next to the house” were found to choose objects closest to themselves due to some kind of salience, as opposed to adults who chose the object directly next to the house because of the spatial restriction. In this experiment, we were interested in finding out whether color restrictions outrank spatial restrictions in children’s developing language. Different shades of greens and blues were used to see if the participants would choose the shade with the most salience to them. Participants saw a situation in which there were four trees next to a house: one of another color, then three green trees. However two of the trees were a darker, forest green color and the third was a bright, vivid green. The trees were placed in no particular order in reference to their color. The children were presented with questions similar to, “pick the green tree next to the house.” We were attempting to see if the children would choose the “greenest” tree, as opposed to the one “next” to the house. Including colors in the sentences could cause the salience of specific objects to switch for the children being tested.

CLONING AND EXPRESSION OF A TRYPANOSOMAL PENTATRICOPEPTIDE REPEAT PROTEIN

Nicole Baker

Mentor(s): Jennifer Ekstrom (Biochemistry)

Pentatricopeptide repeat proteins (PPRs) are a new class of proteins containing approximately 35-amino acid repeat motifs. While the exact function of these proteins remains unknown, it is suspected that PPRs, which are often mitochondrially localized, may have a role in RNA-editing. *Trypanosoma brucei*, a parasitic eukaryote, contains many PPRs, some of which appear essential to the survival of the organism. A 27 kDa Trypanosomal PPR protein with approximately 6 repeats was amplified from genomic DNA, inserted into expression vectors, and transformed into various strains of *E. coli*. Two vectors have been tested: pRSF-Duet1 and pET-32 Xa/LIC, which encodes a Trx-Tag thioredoxin fusion protein for increased solubility. Cloning of the protein was difficult as it exhibited toxicity in *E. coli*, so the gene was first inserted into a TA-cloning vector and plasmids from colonies on blue/white screens were sequenced to verify the orientation of the gene. Once the gene was digested from the TA-vector and ligated with pRSF-Duet1, mutagenesis was performed to repair point mutations. Expression attempts revealed that PPR27 was insoluble, only being observed in the inclusion bodies. Extraction from the insoluble fraction and refolding of the protein has not produced a correctly folded protein but experiments done with the thioredoxin fusion protein have shown higher levels of expression and conditions are being varied to further increase the solubility of the protein. Crystallographic studies of the protein will be done to elucidate the function of PPR27 and also to determine if it could be a potential drug target.

REDUCE, REUSE, BE SPARTAN GREEN

Carolyn Baldwin, Brad Corlett

Mentor(s): Bob Albers (Telecom, Information Studies & Media)

A documentary that looks at MSU efforts to be more environmentally conscious, specifically through its recycling efforts. How can students, staff, and faculty become better environmental stewards both on and off campus. Is recycling even the best option?

POLYMATHY OF NOBEL PEACE PRIZE LAUREATES

Aaron Balowski, Loan Nguyen, Ian Scime

Mentor(s): Robert Root-Bernstein (Physiology Natural Science), Michele Root-Bernstein (Theatre)

The purpose of this project is to test the hypothesis that highly creative people are more likely to be polymaths than less creative people by comparing the range and incidence of adult avocations of Nobel prize-winners in peace to those of Nobel laureates in the sciences and to the general population. Our primary source is the official Nobel Prize website (<http://nobelprize.org>). These essays were supplemented by book-length biographies and autobiographies and essay collections. Every example of an adult avocation or hobby was encoded in an Excel spreadsheet and autobiographical or biographical comments about these avocations entered in a Word document. The data were compiled and the incidence calculated for each avocation or hobby. The individual avocation data were also aggregated into larger groupings (visual arts, music, writing, crafts, performing arts, and sciences). The Nobel data were then compared with data gathered in a previous study of Nobel prize-winning scientists (Root-Bernstein, et al., 2008) as well as to data on the avocations of the general population drawn from the U. S. census and the statistical significance of differences determined by chi-squared analysis. Pearson's R was also calculated for each comparison. Nobel prizewinners in peace are like Nobel laureates in the sciences in being statistically significantly more likely to have multiple adult avocations than the average person. Unexpectedly, Nobel laureates in peace are also much more likely to have multiple professional careers or training than Nobel laureates in the sciences.

UTILIZING AUTODESK MAYA 2008 TO CREATE AN IMMERSIVE THREE-DIMENSIONAL EXPERIENCE FOR A THEATRICAL SETTING

Matthew Bambach, Alex Hatch, Jason Maynard

Mentor(s): Daniel Marsh (Telecommunication, Information Studies, and Media)

Now more than ever, three-dimensional digital games are becoming a more prevalent part of American society. This particular research project involves working with the theatre department in the production of three-dimensional digital game visuals for the musical Tommy. The objective of the project is to update the traditional pinball game that Tommy, the main character, plays to something that speaks to the Wii generation. In this case, the scenery is entirely digitally produced and projected, which is a unique challenge for designers. These three-dimensional CG pinball games must be designed, modeled, and animated in Autodesk Maya 2008 to match up with stage choreography. To accomplish this, advanced modeling techniques must be used to create an expansive library of pinball table components to facilitate the design process. Additionally, similarly advanced animation and rendering techniques must be employed to create a unique, immersive, and believable pinball experience. Through familiarizing themselves with these techniques, designers will gain valuable technological experience and knowledge that they will be able to utilize during future projects.

BRAC'S POST-CYCLONE SIDR AGRICULTURE REHABILITATION PROGRAMME: AN IMPACT EVALUATION

Marci Baranski

Mentor(s): Richard Bernsten (Agricultural, Food and Resource Economics)

In the Barisal District of Bangladesh, production of rice, the staple crop, was severely crippled in 2007 by Cyclone Sidr and resulted in food shortages. The development organization BRAC quickly implemented an Agriculture Rehabilitation Programme. Farmers received agricultural inputs and free hybrid rice seed, which was previously not grown in Barisal. This study collected rice farmers and their wives' perceptions of hybrid rice through individual and group semi-structured interviews. Farmers had all grown hybrid rice for one or two seasons, and also continued to grow traditional varieties. BRAC trained farmers, but women did not receive training unless they formally acknowledged themselves as farmers. It was found that women often worked in the field, contrary to regional taboos. Women, who were all involved in post-harvest processing of rice, reported increased workloads due to increased production. Farmers concurred, but felt that the higher yields of hybrid rice were worth the higher intensity of hybrid crop management. High yields from hybrid rice were expected, but increased costs of seed and chemical fertilizers posed an obstacle for continuation. The farmers identified environmental constraints such as flooding, pests, and decreased land fertility as problems in rice production. Despite these obstacles, the farmers plan on continuing and increasing hybrid rice cultivation, even without being provided free inputs from BRAC. It is recommended that BRAC investigate microcredit programs for farmers facing increased start-up costs, and also to reinstate a program to train non-farming women about hybrid rice cultivation.

THE REAL COSTS OF BANKRUPTCY IN THE UNITED STATES

Matthew Barkell

Mentor(s): Ross Emmett (James Madison College)

This year, the Michigan Center for Innovation and Economic Prosperity (MCIEP) has applied the World Bank's Doing Business methodology to each of the 50 US states (as well as the District of Columbia). My particular project deals with the ease of closing a business in the United States. The costs of closing have a profound impact on the decision to locate a business in the United States, yet there has been minimal investigation into this matter. The current methodology used in bankruptcy surveys has proven insufficient in conveying the real costs of closing in a meaningful way. Most indexes of bankruptcy indicators are abstractions at best, and pay no consideration to anything beyond nominal values. My methodology attacks this problem head on by developing a system for standardizing the multiplicity of bankruptcy indicators into a simple, yet meaningful single-value index. Each variable has been calculated with weight to relevant factors (e.g. weighing a state's homestead nominal exemption values with consideration to its median home values). With this data, I will be able to rank each state in its ease of bankruptcy law in a coherent, meaningful way that will provide a much-needed comparative index for those looking to start business, in addition to future scholarship.

PHYSICAL ACTIVITY DURING PREGNANCY AND CHILD BODY SIZE AT 8-10 YEARS

Sarah Bartholomew

Mentor(s): Erin Kuffel (Kinesiology), Lanay Mudd (Kinesiology and Epidemiology), James Pivarnik (Kinesiology and Epidemiology)

Physical activity (PA) during pregnancy slightly decreases birth weight, but effects on child body size are unknown. PURPOSE: To evaluate relationships among trimester-specific PA and child (8-10 years) body mass index (BMI), percent fatness (%fat), and waist circumference (WC) while considering maternal BMI and child diet. METHODS: Mother/child (n=20 pairs) height, weight, and %fat (BodPod) measurements were obtained and BMI was calculated. Child WC was measured. Maternal fitness (VO_{2max}) was measured with a treadmill test. Mothers reported child's current diet and their

trimester-specific PA via recall. Spearman correlations and Mann-Whitney U-tests were used to assess relationships. RESULTS: Child BMI was marginally related to 3rd trimester PA ($r_s = -0.408$, $p = 0.074$), and significantly related to maternal BMI ($r_s = 0.570$, $p = 0.009$) and maternal fitness ($r_s = -0.463$, $p = 0.040$). Child %fat was marginally related to maternal BMI ($r_s = 0.412$, $p = 0.071$) and significantly related to pre-pregnancy PA ($r_s = -0.601$, $p = 0.005$) and maternal fitness ($r_s = -0.551$, $p = 0.012$). Child WC was marginally related to 3rd trimester PA ($r_s = -0.433$, $p = 0.056$), and significantly related to 2nd trimester PA ($r_s = -0.447$, $p = 0.048$), maternal BMI ($r_s = 0.662$, $p = 0.001$), and maternal fitness ($r_s = -0.556$, $p = 0.011$). Meeting milk and grain consumption recommendations was associated with lower %fat ($p < 0.05$). CONCLUSION: Child BMI and WC were inversely associated with 2nd and/or 3rd trimester PA. These findings may have implications for child obesity prevention.

COMMUNITY HEALTH RESEARCH

Padmini Bayisetti

Mentor(s): Arthur Mabiso (Honors College)

In today's society, medical mistrust is a reoccurring issue that can be attributed to many things: social perceptions, cultural formalities, or even previous experiences. Ultimately, medical mistrust can lead to a lack of medical attention due to personal biases which may eventually lead to an increase in breast cancer and a decrease in cancer education among urban minority populations. Therefore, the correlation between regularity of pap smears and medical mistrust is an important avenue to explore. Participants in this study were 173 African American, Arab American, and Latina women residing in and around the Metro-Detroit area that completed a breast cancer literacy assessment tool administered by community health workers. The community health workers were a part of the communities which housed our participants, and therefore were trusted by the women that took part in the study. In addition to the breast cancer literary assessment, a questionnaire measuring levels of medical mistrust, socioeconomic conditions, and their current health insurance was administered to the same group of participants. Analysis included a distribution analysis, a mixed model to account for family random effects, Chi-Square tests of association, and listwise deletions of missing cases. These analyses showed that there was no significant correlation between medical mistrust and screening frequencies. Results show that about 62% of the participants have had a pap smear within the last three years despite their high levels of medical mistrust. Therefore, there is no significant statistical relationship between medical mistrust and cancer screening frequencies. However, there was a very high level of medical mistrust among this population of minority women, with nearly 73% of the participants agreeing that you'd better be cautious when dealing with health care organizations. Although there was no statistically significant correlation between medical mistrust and the regularity of pap smear screenings, it is a concern that the women had such high levels of mistrust in their medical systems.

ANALYSIS OF A PUTATIVE CHLOROPLAST DIVISION GENE, Ssz1

Austin Be

Mentor(s): Katherine Osteryoung (Plant Biology)

Chloroplasts, plant organelles required for photosynthesis, are derived from an ancient endosymbiotic event in which a cyanobacterium was engulfed by a primitive eukaryote. Today, plant cells maintain multiple chloroplasts, with *Arabidopsis thaliana* harboring approximately 100 chloroplasts in each mesophyll cell. Chloroplasts replicate by fission, a process that resembles bacterial division and is dependent upon both eukaryotic and bacterial-derived components. FtsZ, a tubulin-like protein critical for bacterial and chloroplast division, forms a ring structure at mid-cell or mid-chloroplast early in the division process. FtsZ recruits other division proteins and probably provides nominal force for the constriction process. Another bacterial cell division protein, ZipA (FtsZ interacting protein A), is an essential protein in bacteria and is thought to bundle FtsZ filaments at the division site. Our lab has identified a putative structural homolog of ZipA in *Arabidopsis* that we have named Ssz1 (Structurally Similar to ZipA 1). We show that Ssz1 is a chloroplast protein by examining localization of Ssz1-YFP fusion proteins in planta. Unlike FtsZ, Ssz1 does not localize to a ring, but remains diffuse throughout the chloroplast. Finally, we found that *Arabidopsis* plants with increased levels of Ssz1 and homozygous T-DNA insertion lines possess chloroplast numbers indistinguishable from wild-type. These data show that *Arabidopsis* Ssz1 is a chloroplast protein, but is probably not involved in controlling plastidic FtsZ assembly or chloroplast division.

MANAGEMENT OF RESIDENTIAL NATURAL RESOURCES BY RECENT RURAL IN-MIGRANTS

LeighAnna Beach

Mentor(s): Craig Harris (Sociology)

Population growth and urban sprawl are two issues that have long concerned environmentalists. Another, more modern phenomenon is that of urban to rural migration, wherein residents of urban or suburban areas buy property in areas more rural, less developed. This study is concerned with the land use decisions made by these new rural residents. The study is centered in Southwest Michigan, Barry Township within Barry County. The area is one of shifting land use patterns and increasing residential development. The initial list of targeted participants was compiled through comparison of Platt maps from 1995 and 2003 to determine new landowners, who were then contacted by letter and phone call to schedule interviews. Interviews covered motivations for moving to the area, current land use activities, and sources of information about these activities. Analysis of initial series of interviews was made to determine trends and patterns.

LINGUISTIC VARIATION OF THE POSITION OF OBJECT PRONOUNS IN SOUTHERN FRENCH

Jonathan Beagley

Mentor(s): Anne Violin-Wigent (French, Classics, and Italian)

This research focuses on linguistic variation in the variety of French spoken in Southern France. Specifically, we are studying the relative position of object pronouns when two of them are used. In Standard French, the order of object pronouns is fixed: *Je la lui donne*/I it to him give/I give it to him. However, Southern French does not have a fixed order for object pronouns, most likely due to the influence of the regional language that used to be spoken there called Occitan or Provençal. The speakers surveyed came from Briançon, France and data were collected using a survey including both orders (e.g. *Je la lui donne* vs. *Je lui la donne*). Speakers were asked to judge the acceptability of sentences in a list containing both orders. After this, the data were analyzed and correlated with linguistic and social variables, including age, sex, and level of education. The results show that the speaker's sex is not a significant factor in determining which order is used. However, the results do show that the tense of the verb exhibits some influence on which order is used, i.e. verbs conjugated in the past are more likely to use non-standard word order than those conjugated in the present or future tenses or those left in the infinitive form.

ANALYSIS OF A TRANSCRIPTIONAL MECHANISM IN HIGHER PLANT DEVELOPMENT

Garrett Berry

Mentor(s): Steve van Nocker (Horticulture)

Transcription - the synthesis of RNA from DNA - is the first of several essential steps to build the various cells and tissues of plants and animals. In budding yeast (*Saccharomyces cerevisiae*), numerous protein factors assist RNA Polymerase II (PolII) as it transcribes through a gene. Among these, the Spt4 and Spt5 proteins have an important role in mediating interaction between PolII and the machinery that controls how the gene is packaged into chromatin. In *Arabidopsis thaliana*, control of transcriptional elongation is crucial in several developmental processes including flowering timing and floral development, and has been implicated in a mechanism to antagonize developmental gene silencing. However, the specific components of such a mechanism are unknown. We identified several SPT4- and SPT5-related genes in *Arabidopsis*, and are analyzing the role of these genes in growth and development. We are using two reversed-genetic techniques: insertional mutagenesis and targeted gene silencing. Insertional mutagenesis uses sequence-indexed transgenic lines containing a T-DNA insertion at a known position within the gene of interest. Targeted gene silencing uses artificial microRNA (amiRNA) technology to suppress the activity of known genes through endogenous RNA interference mechanisms. We are identifying plants in which the Spt4- and Spt5-related genes are accurately suppressed, and analyzing these to identify any phenotypic abnormalities. This approach should lead to the identification of genes whose expression is dependent on Spt4/Spt5 function, and provide novel insights into transcriptional control of development in *Arabidopsis*.

DKR: ENHANCED CONVERSION OF ALPHA-ARYLALANINES TO BETA-ARYLALANINES VIA COUPLED RACEMASE-PAM REACTION

Joshua Bilsborrow

Mentor(s): Kevin Walker (Chemistry & Biochemistry and Molecular Biology)

The phenylalanine aminomutase (PAM) enzyme from *Taxus* plants converts (2S)- α -phenylalanine to (3R)- β -phenylalanine, the first step in the synthesis of the phenylisoserinoyl side chain of the anti-cancer drug Taxol. In addition, PAM can utilize a variety of substituted phenylalanine derivatives as substrates, producing the corresponding β -amino acids, many of which are useful as precursors for pharmaceutical syntheses. As (2R)- α -aromatic amino acids are not substrates for PAM, a racemic mixture will become enriched for the unproductive enantiomer. Meanwhile, the equilibrium for the PAM reaction limits the yield for the β products to 50% of the original (3R)- α -amino acid starting material. Dynamic Kinetic Resolution (DKR) conditions can be employed to maintain a continual racemate in the assay mixture, leading to a corresponding increase in β -product synthesis. A promiscuous alanine racemase, cloned from *Pseudomonas putida* and heterologously expressed in *Escherichia coli*, was used to sustain a racemic mixture under DKR during the PAM reaction. The coupling of the racemase and PAM enzymes resulted in increases of up to 20% for the corresponding β -products.

NOVEL SPECTINOMYCIN RESISTANT MUTATIONS IN CHLAMYDOMONAS REINHARDTII

Allison Blaine

Mentor(s): Barbara Sears (Plant Biology)

Reflecting their endosymbiotic origins, chloroplasts have prokaryotic genetic systems, including ribosomes, which are sensitive to antibiotics that inhibit prokaryotic translation. The unicellular green alga *Chlamydomonas reinhardtii* is normally sensitive to spectinomycin, but resistance can occur if the binding site for the antibiotic is altered. Mutations at positions 1123, 1124, or 1125 of the 16S rRNA confer spectinomycin resistance ($spec^R$). We have identified a novel 12 base deletion between bases 1028 and 1039 of the 16S rRNA gene that also confers spectinomycin resistance. However, our studies of spontaneous mutants have shown that some $spec^R$ colonies do not carry a mutation in either of these regions. The goal of the current project is to locate the other mutations that confer spectinomycin resistance in *Chlamydomonas*. Crosses have shown that the other mutations are inherited in a non-Mendelian manner, so our initial search focuses on genes encoded in the chloroplast genome, which has uniparental inheritance. Because the spectinomycin binding site on the small subunit of the ribosome is composed of both 16S rRNA sequences and ribosomal proteins, both are being studied as potential sites of mutation. Several ribosomal protein genes that confer spectinomycin resistance in *E. coli* are encoded in the nucleus of *Chlamydomonas* and are therefore not considered in this project. To date, two ribosomal protein genes have been eliminated as candidates because their sequences in the wild-type and mutants are identical. One ribosomal protein gene is still under investigation.

THROUGH THE MEDIAS LENS REPRESENTING THE 2003 IRAQ WAR

Jeremy Blaney, Krystle Forbes, Matt Harris

Mentor(s): Tremonte Colleen (Comparative Cultures and Politics)

In their increasing popularity worldwide as a mode of obtaining information, television news networks need to be considered as to their ability to 'accurately' and 'fairly' represent the world. However, because these networks also act as businesses that market their product - news - they are inherently attentive to audience expectations. Subsequently, depending upon context and positionality, competing narratives of contemporary crisis or political events often emerged. The coverage of the beginning of the Iraq War in 2003 makes clear how three major networks, in targeting their audience's needs, resulted in three different emerging narratives of the war. This presentation examines these networks' emerging narratives: CNN and its broadcasts to the United States (U.S.) audience; Al-Jazeera and its Middle Eastern viewers; and, the BBC and its British targets. Indeed, CNN, Al-Jazeera, and the BBC presented the same war to three different audiences from three distinct contexts, and as a result, three separate narratives emerged.

OUTLIERS: HOW THEY INFORM RESEARCH IN EDUCATION

Kathryn Bonnen

Mentor(s): Timothy Pleskac (Psychology)

In the novel *Outliers*, author Malcolm Gladwell illustrates an idea which educators have been aware of for quite some time. A person's circumstance, the values, culture, people, and history that surround a person, have a profound effect on their life's trajectory. The public school system is based on the underlying principle that every child has the right to an education and implicitly that every child is capable of achieving that goal. But like Gladwell, educators are cognizant of the power of circumstance and furthermore that it will lead some students to finish their education and others to drop out. However, educators do have some control over factors that contribute to the circumstances effecting student academic achievement. Through the lens of selected outliers - those individuals and schools who have succeeded in high academic achievement - I will perform a critical analysis of current research regarding school size and organization and its effects on academic achievement in the interest of comparing the profiles of these outliers with the findings of current research in the field of education.

EFFECT OF FREEZE DRYING AND HOT-AIR DRYING ON TOTAL ANTHOCYANINS IN TART CHERRY POMACE POWDER

Ellen Bornhorst

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

Anthocyanins are pigments found in fruits, such as blueberries, cranberries, grapes and cherries. Consumption of these foods may bring health benefits, such as antioxidant and anticancer properties (Giusti, M. Monica and Ronald E. Wrolstad, 2001). In this study tart cherry skins (pomace) were examined because they are normally discarded after cherry processing. Drying of cherry pomace can cause the anthocyanins to degrade, which in turn affects the marketability of this powder by-product. The objective of this study was to analyze the total anthocyanin content after drying cherry pomace by two different methods: freeze drying and cabinet drying. The total anthocyanin content was measured using the pH differential method (Giusti, M. Monica and Ronald E. Wrolstad, 2001). Prior to analyzing the anthocyanin content, the dried pomace was extracted using an adapted method (Chaovanalikit, A and R.E. Wrolstad, 2004). Freeze dried cherry pomace, on average contained 37.4498 mg anthocyanin/100 g cherry powder db while the cabinet dried pomace contained 17.8496 mg anthocyanin/100 g cherry powder db. Therefore, the cabinet-dried pomace experiences more anthocyanin degradation than the freeze dried pomace. This study shows that freeze dried cherry pomace best retains anthocyanins and may have potential as a profitable by-product.

INFLUENCE OF GENDER ON CORTICAL ACTIVATION

Carolyn Botting, Srikar Katneni, Elizabeth Sheldon

Mentor(s): Jie Huang (Radiology)

Twelve right-handed, neurologically healthy individuals (between the ages of 18-24), six males and six females, participated in a functional Magnetic Resonance Imaging (fMRI) research experiment. The fMRI scans measured the magnetic signal change caused by local biological change of deoxygenated hemoglobin due to neuron firing. This magnetic signal change was then used to view cortical activation during the performance of two different types of tasks. During the scans, the subjects were asked to read neutral and negative stories and also to solve algebraic and arithmetic math problems. The cortical activation of males versus females was compared in regards to the different tasks. It was predicted that brain activation would not be based on gender differences, but would rather be based upon the individual. Upon analyses of the data, it was discovered that the same areas of the brain were stimulated in both males and females; however males showed broader cortical activation than females while performing the same tasks. This trend could be further investigated in the future through a larger subject base and greater variation in tasks.

CURRICULUM ADAPTATION AND MERGING WORLDS IN MIDDLE SCHOOL SCIENCE EDUCATION

Caitlin Brecklin

Mentor(s): Angela Calabrese-Barton (Teacher Education)

Recent research in New York by Angela Calabrese Barton and Edna Tan has focused on the “science practices” girls use to merge their social worlds with the world of school science in support of deeper engagement, as well as the pedagogical strategies that teachers use to support girls in doing so. My research focuses on expanding our understanding of how teachers go about adapting curriculum in support of girls merging practices. In a study in Jackson, MI. I have helped develop case studies from the NYC research for further use with the LiFE curriculum, which encourages a scientific exploration of nutrition, food, and body science in the middle grades. The New York cases were offered to teachers as potential lessons, then further adapted to fit the LiFE curriculum and each class’ needs. Based on previous design studies, we hypothesize that how teachers adapt curriculum to be responsive to merging practices is a function of how teachers understand and recognize how the social worlds of girls inform the resources girls activate towards learning. We further hypothesize that the forms of adaptation used by teachers may have outcomes that impact different dimensions of science learning, including meaning making, identity development and participation. Finally we hypothesize that teacher adaptation of curriculum happens in a variety of spaces (pre, during, post instruction) and that these different spaces utilize a nuanced set of resources. Using design-based research, classroom ethnography and pre/post testing, we are testing our hypotheses among 450 students and their teachers.

ESTIMATION OF THERMAL DIFFUSIVITY OF CHERRY POMACE AT HIGH TEMPERATURES

Patrick Breen

Mentor(s): Kirk Dolan (Food Science and Human Nutrition)

Thermal property data of low-moisture foods during high temperature processing are scarce. Yet, thermal properties are important for designing thermal processes that optimize nutrient retention in foods. The objective of this study was to estimate thermal properties using a non-isothermal method. Cherry pomace was used to simulate low-moisture foods to determine thermal properties for high-temperature, pressurized, non-isothermal heating processes. Cherry pomace at three constant moistures 19%, 35%, and 55% (wet basis) was heated in vacuum sealed steel cans (radius 0.027 m and height 0.073 m), with thermocouples placed at the center, up to 126°C in a FMC steritort. Finite element program was used to compute the can center temperature. Non-linear regression was used to minimize the sum of squares of observed vs. predicted temperature to estimate the thermal diffusivity. Thermal diffusivities ($m^2/s \times 10^{-7}$) for 19%, 35%, and 55% MC as a function of temperature were found to be $-0.024T+4.781$, $-0.0026T+2.378$, and $0.0019T+1.549$ respectively ($T = 25$ to $126^\circ C$). The root mean square error was $1.21^\circ C$. The difference in thermal diffusivity at three different moisture levels was significantly different at lower temperature but the difference was very small at higher temperature. Sensitivity plots showed that both the parameters can be estimated uniquely. The proposed non-isothermal method can be applied to any low moisture product to obtain the thermal properties within the range of processing temperature in a single experiment. The temperature dependent thermal properties will provide a realistic behavior in modeling the thermal processing of food.

SILICIC VOLCANICS IN THE SOUTH MOUNTAIN REGION: A VOLCANIC CENTER ASSOCIATED WITH THE BREAKUP OF RODINIA

Christian Briggs

Mentor(s): Tyrone Rooney (Geological Sciences)

The waning stages of large igneous provinces prior to continental rifting and breakup are characterized by volumetrically less significant felsic volcanics. The origin of these felsic volcanics remains a source of significant debate – do they represent additions of new crust derived from the mantle, or the melting of continental crust? We examine the South Mountain felsic volcanism in Pennsylvania, part of the Catoctin Formation. These Late Neoproterozoic magmas are associated with the breakup of Rodinia and the formation of the Iapetus Ocean. The South Mountain felsic volcanics are predominantly rhyolitic and can be subdivided into high Al_2O_3 (>11.8 wt. %) and low Al_2O_3 (<11.8 wt. %) groups. Each group forms distinctive trends against differentiation indices. A Eu anomaly is present in both groups but is more pronounced in the low-Al group. In both groups, La and Yb indicate amphibolite partial melting trends based on REE models (Brophy, 2008). Decreasing Dy/Yb with increasing SiO₂ is another indicator of a hornblende rich source for the South Mountain rhyolites. To explain these geochemical trends, we propose that the South Mountain rhyolites were produced by the partial melting of a plagioclase-bearing amphibolite source. The two groups may be produced by variable concentrations of plagioclase in the source

amphibolite. Comparison of the South Mountain rhyolites with other large igneous provinces may provide insight into the petrogenic processes generating felsic volcanism during continental break-up.

MODULAR PAVEMENTS

Wouter Brink

Mentor(s): Neeraj Buch (Civil Engineering)

Modular pavement technologies have been looked into sporadically over the last 20 plus years. In the early years, the technology was looked into as a matter of technical curiosity, that is, to investigate if modular pavement technology was technically feasible. No serious attempts were made then to fully develop the technology as a cost-effective strategy and to implement the technology on a production basis. Now, as more mileage on the primary highway system and urban roadways are reaching maturity and need for timely pavement repair and rehabilitation becomes acute and urgent, highway agencies are looking at new/innovative technologies, including modular pavement technologies, that will result in shorter lane closures and long-life pavements that are economical over the life cycle and do not require major interventions for repair or rehabilitation during their service life. Over the last ten years, significant developments have resulted in modular pavement technologies and use of these technologies is becoming technically feasible and economically justifiable.

DETERMINING COFACTOR ASSOCIATION WITH KNIRPS DURING WING VEIN DEVELOPMENT

Jacqueline Brosius

Mentor(s): David Arnosti (Biochemistry)

Repression of gene transcription is mandatory for the embryonic development of *Drosophila*. One important repressor is Knirps, a protein necessary for anterior and posterior embryonic segmentation, wing vein development, and tracheal formation. In Knirps null mutants, embryonic segmentation is inhibited and the second wing vein is stunted. The mechanism of short-range repression is still unclear, but known to involve distinct classes of cofactors. When Knirps is purified from extracts, the high molecular weight indicates that several cofactors are associated with Knirps in this transcriptional complex. Knirps has been found to have reduced function without the presence of the dCtBP and Groucho corepressors, although their overall functional significance for Knirps action is poorly understood. Because Knirps functions as a repressor multiple times during distinct stages of development, it is likely that different mechanisms and combinations of cofactors are used for each stage. I am looking specifically at the association of Groucho and dCtBP with Knirps during wing vein development in order to elucidate which of these proteins is required for repression at this stage. I will eliminate the binding site on Knirps for dCtBP in order to test for wing vein development mutations without dCtBP, then do the same for Groucho. Finally, I will eliminate the binding sites for both dCtBP and Groucho. If one of these situations results in a wing vein mutation, it can be assumed that the missing cofactor is necessary for Knirps transcriptional repression during wing vein development.

COMPARING AP-1 AND ETS ACTIVATION LEVELS IN MAMMARY CELLS TRANSFORMED WITH THE MIDDLE T ONCOPROTEIN AND KEY MUTANTS

Alexander Brown

Mentor(s): Michele Fluck (Microbiology & Molecular Genetics)

The transcription factors Activator Protein-1 (AP-1) and Ets are important in the genetic regulation of metastatic mammary tumors. These transcription factors play a critical role in the production of mRNA of several enzymes involved in the extravasation of metastatic mammary tumors, such as COX-2 and certain MMP's (matrix metalloproteinases). It has been established that certain murine mammary cell lines expressing Middle T (MT), a transmembrane oncoprotein of the Polyoma virus, exhibit increased cellular expression of AP-1 and Ets transcription factors. The Middle T protein contains three Tyrosine residues, which upon phosphorylation activate several signaling cascades involved in cellular transformation. Two key residues, T315 and T250, are responsible for the activation of the PI3K (Phosphatidylinositol-3 Kinase) and MAPK (Mitogen-Activated Protein Kinase) pathways, respectively. Using the murine mammary cell line NMuMG (Normal Murine Mammary Gland), one wild-type MT and two mutants, MT-ΔT315 and MT-Δ250T were established. Using this model, comparisons were made in the production of AP-1 and Ets transcription factors between the normal and MT transformed cancerous cell lines. Additionally, comparisons made between the wild-type and mutant MT cell lines provide insight on the importance of the individual Tyrosine residues and their role in the production of the aforementioned transcription factors.

SYNTHETIC GENE DESIGN OF TYPE THREE SECRETION SYSTEM NEEDLE PROTEIN HRPA TO ENHANCE CRYSTALLIZATION

Jason Brunton

Mentor(s): Dennis Arvidson (Microbiology)

Pseudomonas syringae is a bacterial pathogen affecting crops utilizing a type three injectisome to introduce effector proteins into the host cytoplasm. HrpA is the protein that polymerizes to form the needle of the injectisome, whose function is imperative for pathogenesis. Previous crystallization attempts have not yielded diffractable crystals, so here multiple mutants have been developed in order to facilitate crystal formation. These mutants have single amino acid mutations from either lysine or glutamic acid residues to alanines, which reduces surface entropy of the protein. This reduction of entropy facilitates the orderly precipitation of protein into crystals over unordered thermodynamic "traps". Polymerase Chain Assembly (PCA) is a form of gene synthesis in which overlapping primers are assembled into genes of greater length. By incorporating different combinations of primers in the PCR, these mutants can be created in a fast, cheap, efficient manner. These mutants will then be purified for crystallization trials.

SPECIFICITY TESTING OF AN ELECTROCHEMICAL BIOSENSOR FOR THE DETECTION OF ESCHERICHIA COLI O157:H7

Lauren Bul

Mentor(s): Evangelyn Alocilja (Biosystems Engineering)

The objective for this study is to test the specificity of an electrochemical biosensor for use in the detection of *E. coli* O157:H7. Samples of *E. coli* O157:H7 and various microorganisms are serially diluted and tested using an electrochemical antibody-based biosensor. The biosensor consists of biostrips that are coated with polyclonal antibodies, and then placed on a platform between two electrodes attached to a multimeter. Test samples are made up of polyaniline-coated magnetic particles that are coated with *E. coli* O157:H7-specific monoclonal antibodies. Bacteria is added to these test samples, and then this mixture is applied to the biostrips. The binding of the antigen to the antibodies on both the magnetic particles and the biostrips means that a bridge is formed between the electrodes. This leads to a drop in resistance across the sensor which only occurs when *E. coli* O157:H7 is present due to the specificity of the antibodies used. Detection is completed in six minutes. The results of the test for *E. coli* O157:H7 are then compared with the test results of other waterborne pathogens, such as *Staphylococcus*, *Klebsiella*, *Citrobacter*, *Enterobacter*, *Enterococcus*, *Shigella*, *Pseudomonas*, and *Salmonella*. No resistance drop is seen in the samples with non-target microorganisms. Resistance readings are similar to that given by a blank control sample. Based on these results, the biosensor could be used to rapidly detect the presence of *E. coli* O157:H7 in water.

BODY THEORY, A COLLECTION OF CRITICAL AND CREATIVE RESOURCES

Dustin Burden

Mentor(s): Ramona Fernandez (Writing, Rhetoric and American Cultures)

From 1900 to 1978, Literature Online lists 95 citations under 'body' and 'criticism,' between 1978 and 1988 the citations increase to 452, between 1988 and 1998 the citations increase to 2720, between 1998 and 2008 the citations increase to an incredible 5112. Since the mid-Twentieth Century the concept of the body has received an unprecedented amount of scholarly attention. The growth and diversity of body discourse seems to have erupted in the mid-to-late Twentieth Century. This project seeks to represent the proliferation of body discourses emerging out of the post-modern era by creating an extensive annotative bibliography that represents, and efficiently organizes the burgeoning discourses of the body. To insure the student researcher is citing the most relevant entries the student researcher will use the web-based program Zotero in order to seamlessly cite these various texts. In addition, the student researcher will work closely with his mentor, using scholarly based search engines, and contact other professional in the field.

COMPARATIVE TOXICOGENOMICS OF TCDD AND TCDF-ELICITED EFFECTS IN MICE: EROD ANALYSIS AND EVALUATION OF TCDF TOXIC EQUIVALENCY FACTOR (TEF)

Ashley Burg

Mentor(s): Lyle Burgoon (Biochemistry and Molecular Biology), Tim Zacharewski (Biochemistry and Molecular Biology)

2,3,7,8-Tetrachlorodibenzo-*p*-dioxin (TCDD), a halogenated coplanar molecule, is known to be the most toxic man-made compound. TCDD enters the environment as an industrial byproduct and due to its high lipophilic properties and resistance to degradation it bioaccumulates within mammalian systems, particularly in the liver. Toxic effects elicited by dioxin and dioxin-like compounds are mediated via Aryl hydrocarbon Receptor, including induction of Cyp1a1, a prototypical marker of dioxin exposure. To better assess toxicity, a Toxic Equivalency Factor (TEF) concept has been adopted, where toxic effects of a dioxin-like compound are contrasted with TCDD (TEF=1.0). In this study, a comparative hepatotoxic evaluation following exposure to a dioxin-like 2,3,7,8-tetrachlorodibenzofuran (TCDF, TEF = 0.1) and TCDD, was examined in immature, ovariectomized C57BL/6 mice. In a dose-response study, mice were orally gavaged with either TCDD, TCDF or sesame oil vehicle, with TCDD doses ranging from 0.03µg/kg to 30µg/kg, and with corresponding TCDF TEF-adjusted doses. Mice were sacrificed 72 hrs post-treatment, and following liver harvest microsomal fractions were extracted. Ethoxyresorufin-O-deethylation (EROD) assays were performed using kinetic analysis. Enzyme activities were calculated for each treatment at each dose, and the dose-response was modeled to determine the ED₅₀ of each compound. Results gave an ED₅₀ of 1.47 and 40.5 for TCDD and TCDF, respectively, generating a TCDF Relative Effect Potency value of 0.036. The results suggest that TCDF TEF of 0.1 may be an overestimate, however a more comprehensive analysis including dose-response studies at different time points is required.

THE ROLE OF THE STAGA AND TFIID COMPLEXES IN TRANSCRIPTIONAL ACTIVATION DURING HSV-1 INFECTION

John Caldwell

Mentor(s): Steven Triezenberg (Biochemistry and Molecular Biology)

Herpes simplex virus type 1 (HSV-1) virion protein 16 (VP16) is known to be a strong transcriptional activator of viral immediate (IE) early genes. The activation domain of VP16 is capable of recruiting various transcriptional coactivators to the promoter region of these IE genes. Two important coactivators are the TFIID and STAGA complexes. In yeast it has been shown that it is the SAGA (yeast variant of human STAGA) complex, not the stereotypical TFIID that is preferentially recruited to promoters with strong TATA boxes. Because there are strong TATA boxes on HSV-1 promoters, it was hypothesized that STAGA, not TFIID, would be responsible for the activation of transcription during early infection in human cells. This was tested using siRNAs to knock down core subunits of both TFIID and STAGA and using Q-PCR to measure IE mRNA levels. The findings indicate that STAGA is not and TFIID may not be necessary for transcription of IE genes.

BRAIN RESPONSES UNDERLYING CIRCADIAN RHYTHM DISRUPTION

Amy Campbell

Mentor(s): Lily Yan (Psychology)

Circadian rhythms are daily biological rhythms controlled by the principle circadian clock, which is located in the suprachiasmatic nucleus (SCN) of the hypothalamus. Circadian rhythms generated in the SCN are synchronized to the ambient light/dark cycle and are conveyed to other brain regions and peripheral tissue/organs through various output signals. The output control from the SCN ensures the body's behavioral and physiological responses are occurring at the right time of the day. Chronic disruption of circadian rhythms, as seen in shift workers and sleep disorders, is associated with many health problems including cancer, cardiovascular disease and mental disorders. The objective of the present study is to elucidate the neural mechanisms mediating circadian rhythm disruption. Using a behavioral phase-shifting paradigm that produces constant desynchrony between the ambient light/dark cycle and the brain clock, we investigated the expression of the clock gene, PER1 in the SCN to probe the impact of rhythm disruption on the principal brain clock. We also examined neuropeptides vasopressin (AVP), vasoactive intestinal peptide (VIP) and prokineticin 2 (PK2), which are critical for both intra-SCN signaling and output controls in the SCN and the SCN-projecting hypothalamic regions. The results revealed structural and functional changes within the SCN, suggesting plastic response of the SCN network to rhythm perturbation. We also discovered alterations in neural activity and neuropeptide expression in other hypothalamic regions of rhythm-disrupted animals. Taken together, these findings indicate that SCN dysfunction is one of the mechanisms underpinning various health issues associated with shift work and sleep disorders.

HEAVY METAL DETECTION USING A SCREEN-PRINTED CARBON ELECTRODE

David Carr

Mentor(s): Evangelyn Alocilja (Biosystems Engineering)

A disposable electrochemical sensor was developed using low-cost screen-printed carbon electrodes (SPCEs). Simultaneous detection of lead (II) and cadmium (II) was achieved using square wave anodic stripping voltammetry on both bare and bismuth coated SPCEs, in an acetate buffer solution. Conditions such as bismuth concentration and deposition time were optimized to determine trace levels of Pb and Cd. The detection limit of both lead and cadmium was 0.5 mg/L in a 100 µL sample under optimum conditions. This sensor could lead to relatively inexpensive on-site detection of trace levels of heavy metals.

APTAMER SELECTION FOR MICROORGANISM DETECTION

Brian Castro

Mentor(s): Evangeline Alocilja (Biosystems & Agricultural Engineering), Edith Torres-Chavolla (Biosystems & Agricultural Engineering)

Aptamers are oligonucleotides that bind to specific target molecules with high affinity. The use of aptamers in the study and development of biosensors is advantageous over the use of antibodies because aptamers can be generated in vitro without the use of animals. Aptamers are generated through the

SELEX process, which systematically screens large libraries of oligonucleotides for specific sequences. This study seeks to obtain a specific DNA whole cell aptamer to detect *B. anthracis* spores using the SELEX process. In this study, SELEX begins with a counter-selection step, when *B. cereus* spores are incubated in the presence of a single-strand DNA (ssDNA) library. Bound ssDNA sequences are then discarded, and the remaining unbound ssDNA is incubated with *B. anthracis* spores in the positive selection step. The bound ssDNA is then extracted and amplified using a polymerase chain reaction (PCR). Finally, the double-strand PCR products are separated using magnetic beads, and the ssDNA is purified. Previous work was done to optimize the PCR protocol, and current research is dedicated to the generation and optimization of the ssDNA library. Once the ssDNA generation is optimized, the first cycle of selection for the aptamer can be started.

COORDINATED ORGAN DEVELOPMENT IN DROSOPHILA LARVAE

Cristian Chagas, Nathan Parker, Samy Salhadar

Mentor(s): Alexander Shingleton (Zoology)

In multicellular organisms organ size must match body size. How growth of individual organs is coordinated across the body as a whole is, however, unknown. In *Drosophila*, a slow growing or damaged organ causes developmental delay, apparently to ensure that the damaged organ attains its appropriate size at adulthood. The goal of our research was to explore how other organs regulate their growth in response to the damaged organ. Specifically, we slowed growth of the developing wing using targeted RNAi against a ribosomal protein gene. We then assayed how the growth of other organs was affected. Our results show that slow growth of the developing wing also slows the growth of all other organs. This suggests that there is communication among organs in a developing organism. Elucidating the mechanisms of this communication is fundamental to understanding how growth is regulated in multicellular organisms.

TRICHODERMA-ENHANCED ROOT NODULATION IN GARDEN BEANS AND CHARACTERIZATION OF MICROBIAL DIVERSITY IN THE NODULES

Mark Charbonneau

Mentor(s): CA Reddy (Microbiology and Molecular Genetics)

Trichoderma spp. have been documented to be effective bio-control agents against plant pathogenic fungi and were shown to stimulate plant growth by producing phytohormones and enhancing root growth. As a part of our effort to develop ecofriendly plant growth-enhancing microbial formulations, a marked increase in root nodulation was observed in garden beans in the presence *Trichoderma* spp. Our goal in this study was to investigate *Trichoderma*-enhanced root nodulation in garden beans and characterize the microbial diversity in those nodules. Morphology and total number of nodules in experimental and control plants were determined. Surface-sterilized and crushed nodules were used to determine the most probable numbers (MPN) and the diversity of predominant cultivable nodule bacteria present. Isolates were characterized in terms of colony and cell morphology, gram staining, and growth on nitrogen-free selective media for determining putative nitrogen fixers. Isolates were further characterized by 16S rRNA gene sequencing to identify the isolates. Total nodulation was significantly increased in *Trichoderma*-treated plants over controls. The MPN of nodules representing the predominant morphological type were greater in *Trichoderma*-treated nodules than controls. Predominant isolates were *Rhizobium* sp. in nodules from *Trichoderma*-treated plants as well as in those of controls. The results indicate that *Trichoderma* spp. positively impacted total nodulation in the garden bean but had no apparent impact on the microbial diversity of root nodules. Further studies will focus on determining the total microbial diversity (both cultivable and non-cultivable) using newer molecular methods for microbial community analysis.

INTELLIGENT VEHICLE INFORMATION SYSTEMS

Zachary Church

Mentor(s): Constantinos Coursaris (Telecommunications)

The purpose of this study is to determine whether a vehicle information system that would adjust the levels of its interactions (both cognitive and biomechanical) and the modes in which it delivers them based on the complexity of the driving situation would result in a safer driving experience. In the experiment, there will be two groups of drivers. The first group will drive in a simulator that uses a vehicle information system, such as a GPS device, through a course with varying degrees of difficulty. The course will last for 20 minutes. The device will not adjust its inquiries based on the instantaneous difficulty of the course. The second group of drivers will drive the same course in the same simulator, but with a GPS system that varies its inquiries based on the difficulty of the instantaneous driving situation. Both groups will consist of 8 volunteers each, all of whom will be briefed on how to use the vehicle information system ahead of time. If the additional amount of total lane and speed deviations in the first test when compared to the second test is statistically significant, then the hypothesis that a multimodal vehicle information system that reacts to the complexity of the driving situation is safer is correct.

THE USE OF ELECTRO-TRANSFORMATION FOR INSERTION OF RESISTANCE GENES INTO PHASEOLUS VULGARIS

Jennifer Cirino

Mentor(s): Richard Allison (Plant Biology)

The seeds of *Phaseolus vulgaris* (*P. vulgaris*), a common dry bean plant, provide a valuable dietary staple, containing, like other dry beans, a significant source of protein. This is particularly useful for providing an economically feasible source of dietary proteins and minerals in developing countries, but crop loss can be up to 100% as a result of both biotic and abiotic stresses. Developing lines resistant to disease and drought, diminishing their effect on dry beans, could result in a significant contribution to the world's food supply. In our research, electro-transformation was used to insert desirable genes—*bar* and *germin* located within the plasmid pBKSbar/gf-2.8—into the plant *P. vulgaris*. We then looked at the progeny of successfully transformed plants to determine if these genes are heritable. This was done by extracting the DNA of *P. vulgaris* progeny plants and then performing PCR reactions to determine presence of the *bar*, *germin*, and *actin* genes. The *actin* gene PCR was performed to ensure that DNA was extracted from the plant. If the PCR reactions for the *bar* and *germin* genes were positive, a Southern Blot Analysis was performed, probing for both *bar* and *germin* genes. Our findings showed that while the genes of interest, *bar* and *germin*, were successfully transformed, it was at a very low efficiency, and it did not seem to pass onto future progeny. A new transformation system for *P. vulgaris* will need to be researched to perform similar studies in the future.

VACCINES AND BIOTERRORISM

Stacie Clark, Nikki Henige, Kelly Wilt

Mentor(s): Mark Largent (James Madison, Lyman Briggs, History)

Bioterrorism has heightened in recent years as a public health threat due to world events. There are several biological agents of special concern to public health including but not limited to anthrax, smallpox, and botulism. New strides are being made to create an efficient response to such threats, and scientific research is leading the way with new developments in the realm of vaccines to prevent such biological agents from causing mass infection. The United States Government, specifically the Department of Defense, is concentrating on making vaccines the foundation of bioterrorism defense. The

government's National Stockpile contains large amounts of medicine and supplies to be used in case of a public health emergency. However, due to the lack of research and strict regulations on production, the quantity of vaccines to be used for public health emergencies is quite low. The government continues to research the use and efficacy of vaccines as bioterrorism defense, creating a new frontier in public health safety.

ELUCIDATING THE ROLE OF A NOVEL DNAJ-LIKE PROTEIN IN FATTY ACID METABOLISM WITHIN THE CHLOROPLAST

Ardian Coku

Mentor(s): Imad Ajjawi (BMB), Robert Last (BMB)

DnaJ-like proteins are a part of the HSP40 family, which function as molecular chaperones involved in protein folding. As part of the Chloroplast 2010 project to identify the function of roughly 4,400 genes predicted to be targeted to the plastid, an *Arabidopsis thaliana* T-DNA mutant of a gene, At1g08640, which encodes for a DnaJ-like protein, was discovered to exhibit an unusual fatty acid profile. The mutant was identified by fatty acid methyl ester analysis using GC and showed a consistent increase in 16:0, 16:1Δ7, and 18:1Δ9 and a decrease in 16:3. In order to determine the subcellular localization of the DnaJ-like protein, it was fused with GFP and transformed into *Arabidopsis* and analyzed via confocal microscopy. The results, along with a chloroplast import assay, confirmed that the protein is embedded within the chloroplast. Furthermore, the GFP fused protein is to be used in co-immunoprecipitation experiments to determine how and with what proteins the DnaJ-like protein interacts with. Expression of the J-domain of the protein fused with a polyhistidine tag in *E. coli* and subsequent SDS-PAGE analysis of Ni affinity column eluted fractions yielded the presence of several other proteins. Mass-spectrometry determined the identity of some of these proteins to be HSP70s and proteins involved in lipid metabolism. An *in vivo* activity assay involving transformation of the J-domain into a DnaJ deficient strain of *E. coli* resulted in restoration of its ability to withstand heat shock.

EXPLORING ENERGY USE AND CONSERVATION POTENTIAL IN MSU SCIENCE LABORATORIES

Kayla Coleman, Maulik Dhandha

Mentor(s): Michael Kaplowitz (Community, Ag, Recreation and Resource Studies), Laurie Thorp (Residential Initiative in the Study of Environment)

Energy use per square foot from science lab buildings is disproportionately higher than that of other buildings in universities across the nation. There are several factors responsible for this disproportion. One of them is laboratory management and behavior. There has yet to be a thorough investigation of laboratory management and behavior as they relate to adoption of energy efficient practices. In light of MSU's commitment to reduce its carbon footprint in 2015 to 15% of its 2000 emissions, there is a need to improve campus science lab energy efficiency. Our research explores how MSU faculty, staff, and students working in science labs currently use energy and how they might adopt more energy efficient practices. The objectives of our research are: 1) to identify primary energy uses in select MSU science labs and develop an understanding of the lab culture in those selected labs. 2) Identify possible alternatives to current lab practices that meet energy conservation goals while maintaining research quality. 3) Move MSU towards greater environmental sustainability. A sample of science labs will be selected and contacted for primary data collection. In-depth interviews with at least one faculty member, one lab manager, and one graduate student associated with each selected lab would be conducted. Qualitative and quantitative analysis will lead to a set of energy efficiency recommendations for the MSU Vice President of Finance and Operations to save the university money and reduce MSU's carbon footprint.

THE ROLE OF PHOTOPERIOD IN COLD ACCLIMATION

Cynthia Collings

Mentor(s): Michael Thomashow (Plant Research Lab, Crop & Soil Science, Microbiology and Molecular Genetics)

Plants sense and adapt to environmental changes, such as light quality and duration, or changes in temperature. Plants are subject to numerous stresses in their environment, such as freezing stress. Many plants, such as *Arabidopsis*, are able to increase their freezing tolerance in response to a period of low, non-freezing temperature. Many plants undergo metabolic and physiological changes at low, nonfreezing temperatures in a process known as cold acclimation, which increases their ability to survive freezing temperatures. Plants can acclimate to the cold by altering their metabolome and transcriptome. Several transcription factors induced upon low-temperature exposure, such as CBF1-3(C-Repeat Binding Factor), ZAT10, and ZAT12 contribute to freezing tolerance. Seasonal changes, such as decrease in temperature and day length in the fall, enable some plants to establish freezing tolerance. It has been shown that plants grown under short day (8h light/16h dark) are more freezing tolerant those grown under long day (16h light/8h dark); however, the molecular mechanism is not well understood. To determine whether different photoperiods alter the expression of cold-induced genes during cold acclimation, the transcript levels and kinetics of some early cold-induced transcription factors of *Arabidopsis thaliana* grown in two different photoperiods will be examined.

EXPLORING PERCEPTIONS OF USABILITY IN PUBLIC TRANSPORTATION

Sara Colunga-Santoyo

Mentor(s): Constantinos Coursaris (Telecom, Information Studies & Media)

Transportation has given increasing interest to travel activity analysis (Kuppam & Pendyala 2001). Considerable changes over the past several years in cities, demographics, and transit systems have significantly changed the travel patterns of people (Oppenheim 1995). However, the variables found from these analyses cannot be used to explain the motivations and perceptions behind a person's intention to use a bus (Jen & Hu 2003). Understanding the casual mechanisms fundamental to a person's behavior may help improve the effectiveness of travel demand models (Kuppam & Pendyala 2001). This study will adapt a form of the perceived value model to identify these factors (Jen & Hu 2003). This study aims to assess the current state of public transportation by exploring the perceptions of value held by users. Then, with the hypothesis that if the perceived value of bus use (perceived comfort, timeliness, consistency etc) increases, the intention to use also increases. Research participants will be asked to fill out a survey and rank each of the following factors on a scale of one to seven from highly related to bus use to not related to bus use: perceived timeliness, perceived consistency, perceived comfort, perceived convenience, perceived cost, and the option of private transportation. This study seeks to have managerial implications. Pinpointing perceptions can provide managers and marketers, with the information needed to structure the perceptions and alter their bus system to increase ridership and retain their customers.

RENEWABLE ENERGY FOR MICHIGAN SCHOOLS

J. Cory Connolly

Mentor(s): Tobin Craig (International Relations)

Michigan's public school system is notoriously under-funded—simultaneously Michigan is largely dependent upon coal and other non-renewable sources for electricity. These two facts would traditionally seem unrelated; however, Michigan's education system can be enhanced through the use of renewable energy. My research focuses on finding policy mechanisms that can allow schools to benefit from producing renewable energy. I have

examined existing Michigan energy legislation and potential solutions for the future. If implemented, renewable energy could address environmental concerns, increase environmental awareness, teach students about environmental conservation and renewable energy, and save money for Michigan's schools. My research finds that the establishment of a revolving loan fund, for the purpose of supplying renewable energy for schools, combined with the existing net-metering program, can effectively enhance Michigan schools.

EXPRESSION OF ATP BINDING CASSETTE TRANSPORTERS IN CANINE OSTEOSARCOMAS

Virginia Cook

Mentor(s): Manish Neupane (Comparative Medicine and Integrative Biology), Vilma Yuzbasiyan-Gurkan (MMG/SCS)

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 treatment failure. 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. We are currently carrying out real-time PCR to measure the relative abundance of expression among various canine osteosarcoma cell lines. This will provide critical information as to which which ABC transporters are expressed and to what extent in canine osteosarcomas. This study will lay down the foundation for determining the correlation between expression of these transporters and chemotherapeutic resistance.

A STABILIZED SPLICE VARIANT OF THE JASMONATE ZIM-DOMAIN PROTEIN JAZ10 REPRESSES JASMONATE SIGNALLING IN ARABIDOPSIS

Thomas Cooke

Mentor(s): Hoo Sun Chung (Biochemistry and Molecular Biology), Gregg Howe (Biochemistry and Molecular Biology), Leron Katsir (Biochemistry and Molecular Biology)

Jasmonate (JA) is a lipid-derived hormone that regulates various aspects of plant growth and defense. JASMONATE ZIM-domain (JAZ) proteins act as repressors of JA signaling. Perception of bioactive JAs by the F-box protein CORONATINE INSENSITIVE1 (COI1) causes degradation of JAZs via the ubiquitin-proteasome pathway, which in turn activates the expression of genes involved in plant growth, development, and defense. JAZ proteins contain two highly conserved sequence regions: the Jas domain that interacts with COI1 to destabilize the repressor, and the ZIM domain, recently shown by yeast two-hybrid assay to mediate homo- and heteromeric interactions between JAZ proteins through its conserved TIFY motif (TIFF/YXG). Here, we use an in vitro pulldown assay to show that an alternatively-spliced form of JAZ10 (JAZ10.4) that lacks a Jas domain is unable to interact with COI1 in a JA-dependent manner, and is therefore resistant to JA-induced degradation. We also use a pulldown assay to show that JAZ10.4 can form homodimers, and that this interaction requires an intact TIFY motif. Our findings support the hypothesis that JAZ10.4 functions to attenuate signal output in the presence of JA, and that the dominant-negative action of this splice variant involves protein-protein interaction through the ZIM/TIFY domain.

MSU TELECASTERS THE SHOW

David Cooper, Brianna Gardner

Mentor(s): Bob Albers (Telecom, Information Studies & Media)

The ShoW, the longest running college sitcom in the nation, is entirely student-produced and is celebrating its 20th season during the 2008-09 school year. It follows the lives of undergraduates living in 3 East Wilson. The ShoW is a production of MSU Telecasters and sponsored by ASMSU.

BOOK TRAILER: ASSASSINATION VACATION BY SARAH VOWELL

David Cooper

Mentor(s): Maureen McGee (Art & Art History)

A digital animation produced with Adobe After Effects to create a book trailer, not movie trailer, for "Assassination Vacation" by Sarah Vowell. It uses images gathered from varying online sources including Library of Congress to illustrate Vowell's journey into the first 3 presidential assassinations.

ELDERLY INSTRUMENTS DOCUMENTARY

Brad Corlett

Mentor(s): Bob Albers (TISM)

The piece I am showing is part of a larger work done about Elderly Instruments in downtown Lansing. This work is a documentary that was filmed at the music shop expressing the personality of the store. Musicians flock to this store from all over the country, not just musicians who are from the metro-Lansing region. It has become known internationally in the music world for its expert sales staff, its wide selection of instruments, and most importantly the willingness of the ownership to allow customers to try out any instrument before they buy. Anyone can walk into the store, pull a \$5,000 guitar off the wall and start playing it -why, because the owners are passionate about music. One customer interviewed explained that an instrument "is an extension of your soul," so how can you pick the right instrument without playing it first? Many other stores will not allow you to hold, let alone play their most expensive instruments unless they know you are ready to fork over thousands of dollars. The owners of Elderly know the risks involved with allowing anyone to try out any instrument, but because they care so much about their music they can live with these risks.

PREDICTORS OF HIV-RISK BEHAVIOR AMONG YOUNG MEN WHO HAVE SEX WITH MEN IN DETROIT

Sara Cottrill

Mentor(s): Robin Miller (Psychology)

As of 2005, there were approximately 18,000 people in Michigan with human immunodeficiency virus (HIV). Young men who have sex with men (YMSM) are at a particularly high risk for acquiring this virus. A number of socio-demographic characteristics, social group factors, other risky behaviors and aspects of the community may have a role in predicting HIV risk among this population. In order to analyze this, were interviewed between 1999 and 2002. This study discusses the conclusions drawn from analyzing the 1,250 participants from Detroit. Descriptive frequencies of the socio-demographic characteristics and behaviors are presented. Possible risk and protective factors regarding variables such as age, sexual identity, and having ever been tested for HIV are discussed. These results give a descriptive look at YMSM in order to set the scene for possible prevention and intervention programs. Further research may give more concrete predictors of risky sexual behaviors and replicate the current findings.

MECHANICS TRANSITIONS IN HORSES

Natalie Cousin

Mentor(s): Peter Aerts (Biological Sciences), Hilary Clayton (LACS), Sandra Nauwelaerts (LACS)

Most quadrupedal animals have several gaits depending on the speed at which they travel. Each gait is a stable condition, and as shown by different models, the body conserves energy through interchanging kinetic, elastic, and potential energy over each stride, making each gait efficient at its preferred speed. Our hypothesis is that transitions are unstable conditions that require energy input to make the switch between gaits. At transition speed it becomes more energy efficient to switch gaits. The aim of this study is to understand the kinematic and energy profiles of transition from canter (a three-beat gait) to trot (a two-beat gait) and trot to canter. Using miniature horses, markers were attached to anatomical landmarks on the limbs, head, and back in order to define joints and body segments. We defined joint angles as those between body segments, and segment angles as those of body segments with respect to the x-y coordinate system in space. The horses were recorded during a gait transition, and motion analysis was used to track the positions of the markers. From this data we were able to calculate segment length, the center of mass of the segments, segment angles, and joint angles. Joint angles do not seem to noticeably change over a transition; that is the body segments maintain their relative angles respective to each other. The segment angles of the limbs do not show any significant change, however, the segment angles of the head, neck, and back show an abrupt change at the transition.

FUNCTIONAL ANATOMY OF READING STORIES VERSUS SOLVING MATH PROBLEMS USING FMRI

Steven Cox, Sarah Maki, Nicole Van De Velde

Mentor(s): Jie Huang (Radiology Human Medicine)

We used an fMRI scanner to detect the activation levels in different sections of the brain during math and story tasks. An fMRI, functional Magnetic Resonance Image, detects the metabolic changes within the brain, and pairs them with the tasks being completed. These metabolic changes are detected as oxygenated blood flows into the areas of activity. The experiment was designed to detect the activity levels of math and story tasks during active and rest time periods. These time periods were organized into time profiles on the program AFNI. AFNI also allows one to view the activity levels in 30 slices of the brain, from superior to inferior. Matching up these time profiles to their corresponding images made it able to determine the activity within different areas of the brain. From here, the activity centers were found and the data were examined. In total, 12 patient's fMRI scans were analyzed in order to determine if any patterns exist. Upon examination, it was determined that the brain was more activated doing mathematical tasks.

ENTERTAINMENT AND CULTURE IN JAPAN AND ZAMBIA

Michelle Crechiolo, David Dowgiell, Reed Kalso, Kate Kolenda

Mentor(s): Folu Ogundimu (Journalism)

We are exploring entertainment and culture as a process of globalization. This project will explore the effect entertainment and culture has on the world, as well as the effect the world has on it, focusing on two specific countries: Japan, a more-developed country, and Zambia, a less-developed country. There will be four subtopics, which are Internet, Movies and Television, Music, and Sports and Clothing. Each group member will thoroughly research their assigned topic and how it manifests itself in both countries. The criteria includes, but is not limited to, 1) Where in the world our countries' entertainment and cultural fares are drawing their influences from and how they show up in the countries' environments; 2) The appeal and the effect our countries' entertainment and culture have on the world; 3) The actual range of entertainment and cultural fare in Japan and Zambia; and 4) How these subtopics are covered in the media of these countries and how our countries are influenced by global media. The PowerPoint presentation will narrate our observations using images, pictures and/or YouTube video clips.

IMPLICIT RESTRICTIONS IN ADULT LANGUAGE

Amy Cronin, Erik Butterfield, Matthew Karram

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

How individuals interpret the definite article "the", which picks out a unique object or set of objects in a given context, is not completely understood. Given a set of three trees next to a house, people will select the tree nearest the house when instructed to "point to the tree next to the house". The interpretation, "closest to the house", is implied but not explicitly stated in the sentence. A previous experiment that tested this phenomenon found that subjects always interpret the restriction spatially ("closest to"), as predicted by current theories of the meaning of the definite determiner. However, a different experiment found that people may, in certain contexts, accommodate an implicit restriction that is not predicted by the theory. In this study, we investigated how adults make and interpret these restrictions. Two different tasks were used: a truth-value judgment task, in which subjects were asked to verify whether a particular object or set of objects had been circled, and a selection task, in which subjects were asked to select a particular object or set of objects. Three types of possible implicit restrictions were constructed: location, size, and color. We predict that in the truth-value judgment task, subjects will accommodate for a wider range of possible restrictions than in the selection task.

PATTERNS OF SKULL DEVELOPMENT IN WILD CARNIVORES

Stephanie Cunningham, Erica Christensen, Christine Plichta, Valerie Takala

Mentor(s): Kay Holekamp (Zoology), Barbara Lundrigan (Zoology)

During the course of ontogenetic development, carnivore skulls change dramatically in size and shape, and both these variables affect feeding performance. Our goal here was to document variation in patterns of skull development among carnivore species and test hypotheses suggestion that developmental patterns vary in relation to the ecology, life history and phylogeny of each species. We took standardized photographs of museum specimens in multiple views, digitized landmarks on each photograph, and used geometric morphometric techniques to evaluate change in size and shape between birth and adulthood. We also took linear measurements to estimate the maximal bite force that might theoretically be applied by each specimen at various points along the tooth row. We obtained data on ecological, life history and phylogenetic variables from the original literature on each species. Our analyses reveal significant variation in developmental patterns among mammalian carnivores. Our results suggest that adult diet affects patterns of development, but that the phylogenetic heritage of each species also plays an important role.

DISASTER PREPAREDNESS FOR INDIVIDUALS WITH COMMUNICATION CHALLENGES

Stephanie Currier

Mentor(s): Mary Jo Cooley Hidecker (Communicative Sciences and Disorders/Epidemiology)

Recent natural and human-made disasters have highlighted the additional challenges faced by individuals with communication challenges in emergencies. Communication may be difficult between relief workers and people with communication challenges. Evacuation plans are often non-existent or inadequate for people with communication challenges. When evacuated, they may be separated from their assistive technology such as

augmentative and alternative communication (AAC). Due to electric outages, technology may be rendered useless. The objective of this poster is to call attention to these problems and suggest improvements to disaster preparedness. Suggestions are provided for emergency planners, relief workers, and people with communication challenges to assist with planning for evacuation and lengthy stays at shelters. Examples of individual preparedness plans, suggested disaster kit contents, and communication boards will be provided. With appropriate preparation, outcomes will improve for people with communication challenges during and after disasters. Information needs to be distributed to emergency planners, relief workers, and people with communication challenges. Professionals should review the adequacy of emergency plans, educate relief workers, and ensure that people with communication challenges are prepared in the event of an emergency.

A NEW DOG PARK IN INGHAM COUNTY: UNLEASHING THE POSSIBILITIES

Allison Czarnik

Mentor(s): Sarah Nicholls (Community, Agriculture, Recreation & Resource Studies (CARRS) and Geography)

Meridian Township and Ingham County Parks and Recreation have recently noticed a substantial increase in off-leash dog park users at undesignated areas. The organizations would therefore like to know whether or not there is sufficient demand from their residents for the development of a new countywide off-leash dog park. A survey was designed to ascertain local dog owners' attitudes towards and perceptions of dog park facilities. In particular, the survey focused on the need for a new dog park as well as current users' use patterns, needs and preferences with regards to a proposed new facility. The survey was administered at the two existing dog park locations in (East) Lansing in Fall 2008, with 298 surveys collected. The overwhelming majority of respondents indicated their support for the opening of a new dog park in the county. The majority of respondents also indicated they would visit the park on a year-round basis. The most important factors influencing the decision whether or not to use a particular dog park were identified as the convenience of its hours of operation, and its levels of cleanliness and maintenance. The two features considered most important within a dog park were adequate waste disposal facilities and water fountains, for both people and their dogs. The data collected during this project will be used in the preparation of a grant proposal to be submitted to the Michigan Department of Natural Resources for the monies needed to design and create a new dog park facility in Ingham County.

FUNCTIONAL GENOMICS OF SYMBIOTIC GENES IN NEMATODE HETERORHABDITIS BACTERIOPHORA USING RNAI

My-Trang Dang

Mentor(s): Todd Ciche (Microbiology and Molecular Genetics)

The insect parasitic nematode *Heterorhabditis bacteriophora* is a model used to study the symbiotic and parasitic interactions between organisms. *H. bacteriophora* is a symbiotic host for a Gram-negative bacteria *Photobacterium luminescens*. With this association, the nematode is highly pathogenic to insects. Due to this interaction, *H. bacteriophora* is currently being used in the biological control of insects in many parts of the world. The objective of this study is to determine the nematode genes that partake in the symbiosis interaction between *H. bacteriophora* and *P. luminescens* using RNA mediated gene silencing (RNAi). *H. bacteriophora* is a close phylogenetic relative of the better studied model worm *Caenorhabditis elegans*, which help facilitates the comparative studies of *H. bacteriophora*. Genes of interest were identified using *C. elegans* orthologs partaking in pathways that regulate innate immunity. The regulation of sensitivity to bacterial infection includes the DBL-1/TGF β , DAF-2/DAF-16, and MAP Kinase pathways. Additionally, genes from the ERK pathway are being studied for bacterial adhesion in infections. Primers tagged with the T7 promoter sequence were used to amplify dsDNA into dsRNA using a T7 RNA polymerase after the initial amplification of dsDNA through Polymerase Chain Reaction (PCR). Eggs and early larval (L1) stage *H. bacteriophora* were harvested through filtration and soaked in the dsRNA to silence the respective genes. The resulting nematode phenotypes were observed using gross microscopy and fluorescent microscopy. As of now, 13 genes have been analyzed and work is currently in progress to identify the genes that are essential for the nematode-bacteria symbiosis.

DIVERSITY OF ETHNICITY IN ENTERTAINMENT AND CULTURE BETWEEN THE UNITED STATES AND JAPAN

Kristen Daum, Adrian Kikes, Jenni Lewis, Meredith Skrzypczak, Nicquel Terry

Mentor(s): Folu Ogundimu (Journalism)

Through the scope of entertainment and culture, we will analyze the level of diversity of ethnicity in media found in the United States versus Japan. Specifically, the research will look at the following five aspects of entertainment and culture, and how levels of diversity are reflected: Music, Film, Fashion, News media, and Business and technology. Being that the United States is quantitatively a diverse nation in terms of race and ethnicity and that Japan is quantitatively not, the research should prove to be a revealing contrast and comparison between two equally developed industrial nations.

CHARACTERIZING AND OPTIMIZING A PREDICTIVE FRAMEWORK FOR WINE PRODUCTION USING A COLLABORATIVE INTERNET DATABASE OF COMPLEX BUFFERS

Thomas Davis V

Mentor(s): Daniel Dougherty (Mathematics)

The beneficial process of malolactic fermentation is a naturally occurring process that can be observed in not only wine vinting but throughout the food and beverage industry. Malolactic fermentation converts L-malic acid into L-lactic acid. This process is carried out, for example, by the heterolactic bacterium, *Oenococcus oeni*, and is found to be beneficial to the vinting of some varieties of white wines by lowering the pH and inhibiting the growth of both aerobic and anaerobic bacteria. Primary lactic acid fermentation, which occurs simultaneously, converts sugars in grape juice into lactic acid. Excessive lactic acid concentrations are associated with various off-odors and an unpleasant taste. In this study, we establish a database of buffer response profiles for various stages of red and white wine fermentation using defined mixtures of fruit juice with known concentrations of the most predominant fermentation acids. This project will help advance other areas of food production and food safety. The project incorporates the use of a computer-modeling program that can help to accurately predict the properties of the complex mixtures. Future research may involve the use of this software in optimizing food safety and production.

TEXT AND IMAGE DENSITY EFFECTS ON WEB USABILITY

Bethany Davis

Mentor(s): Constantinos Coursaris (Telecommunication, Information Studies & Media)

In an increasingly electronic world, consumers look to the Internet as a primary source of both information and as an access point to other services previously found only in stores. Not only does the web offer convenience of location, but it also saves time—at least in theory. All too often, however, people get online to complete a transaction and find themselves unable to navigate websites. This hypothetical experiment is intended to determine how text and image density, two important layout factors, affect the usability of a website. By improving the layout of a site, customers would potentially receive a sense of satisfaction, and the provider would experience an increase in sales. In this experiment, users would use the web to

purchase transportation tickets, giving businesses feedback about how to adjust their online ordering layout. The subjects will be of diverse demographic backgrounds, and they must have 2-3 years of regular Internet use and 2-3 experiences purchasing tickets for transportation. Users will then be divided into four groups, and each group will participate with one of four different versions of the website with varying levels of text and image density. The usability of each version of the site will be measured by the number of links activated and the time taken to accomplish the task of buying a ticket with a given company to a specific location on a certain day at a given time. These measures of efficiency will represent the usability of the website.

IMPROVING THE FACEBOOK MOBILE INTERFACE TO INCREASE USABILITY

Bethany Davis, Carly Fleming, Nicole Lysak, Emily Schneider, Miranda Sperry

Mentor(s): Constantinos Coursaris (Telecommunication, Information Studies, and Media)

In an increasingly technology-oriented world, consumer demand for access to the Internet has skyrocketed (Hyers & Fischer, 2002). Users are no longer willing to be constrained by a desk, but rather rely on mobile devices to provide a constant stream of information (Hyers & Fischer, 2002). Providers have responded by creating a variety of web-capable phones (Forgue, 2006). However, while these devices fulfill some needs, they also raise issues that were previously not among developers' priorities (Telecomworldwire, 2005). Small screens and slow connection speeds frustrate consumers who expected using the mobile web to be an experience identical to sitting down at a computer (Shrestha, 2007). Developers continue to modify their websites to adapt to these new circumstances, remodeling interfaces and often eliminating unnecessary features altogether (New Media Age, 2008). Facebook, a social networking site that recently reached 175 million active users, released a mobile version of its website, m.facebook.com, in 2006 to be used primarily on smartphones and other portable wireless devices (Facebook, 2009). This study is intended to determine how the Facebook Mobile interface can be improved to better serve its broad range of users. Michigan State University undergraduate students will complete a survey as an opportunity to give feedback about their experiences with the current mobile site. Their input regarding the features and overall usability of m.facebook.com will provide a clear picture of what improvements students recommend to increase the efficiency and effectiveness of the interface.

CROSS-CULTURAL DECEPTION

Marleah Dean, Jeffrey Hartman

Mentor(s): Tim Levine (Communication)

There is currently little useful information about cross-cultural similarities and differences in deception and deception detection. The goal of the current research is to enhance cross-cultural understandings of deception, especially its types and motives. The data consists of open-ended, written responses from Egypt, Pakistan, Saudi Arabia, and the United States. Respondents were asked to describe, in detail, either a time when they were deceived by someone or a time when they deceived someone, or both. Categories of deception types were derived and included personal transgression, economic advantage, social polite, altruistic, self-impression management, malicious, humor/joke, pathological, avoidance, and other. In addition, severity of the deception, the liar-dupe relationship, the hierarchy in the relationship, and the communication medium were coded. This type of research is important for several reasons. First, because little previous work exists, the current work provides an important starting point for a new avenue of research. Second, understanding cross-cultural differences can help avoid misunderstandings. Third, the research may have important applications for national security and screening at portals. Ultimately, the findings will bolster cross-cultural deception research and hopefully assist in creating effective deception screening tests.

CONTENT ANALYSIS OF BREAST CANCER WEBSITES

Marleah Dean

Mentor(s): Sandi Smith (Communication)

According to the American Cancer Society, breast cancer is the second most prominent cancer for women. Approximately one in eight women will have invasive breast cancer in her life, with an anticipated 182,460 United States women to be diagnosed just this year. Furthermore, 80% of Americans report using the internet to visit health websites (Fox, 2006), and 41% of breast cancer patients use the internet for finding information (Fogel, Albert, Schnable, Dittkoff, & Neugut, 2002). Despite the prevalence of women's breast cancer information-seeking on the Internet, there has been little focus on the content of breast cancer websites. Thus, the goal here is to determine what content is being presented to internet users in the top breast cancer websites. The sample consists of 100 of the most frequently accessed breast cancer websites by searching for "breast cancer" and "breast cancer and the environment" in the three most common search engines—Google, Yahoo, and MSN according to Nielsen/NetRatings (Bausch and Han, 2006). The topics of awareness, prevention, environmental risk, detection, treatment, survivorship, and social support were coded. This type of content analysis is important for two reasons. First, it is important to understand what content women who are using the internet for health information and answers are exposed to, and second, it is important to determine whether websites provide an emphasis on environmental factors in relation to preventative actions toward breast cancer. Ultimately, the findings may assist website designers in better serving their target audience.

ISOLATION OF NOVEL BACTERIA THAT ARE CAPABLE OF USING UNIQUE CARBON SOURCES AND THEIR ROLE IN BIOENERGY

Noel Decker

Mentor(s): Thomas Schmidt (Microbiology and Molecular Genetics), Clive Waldron (Microbiology and Molecular Genetics)

The number of microbial species found in one gram of soil may be as high as 10^6 yet possibly only 1% of the bacterial species have been cultured in labs. The research conducted aimed to isolate novel bacteria and evaluate its use in the production of bioenergy. Soil samples were collected from the Kellogg Biological Station in a zone where corn is grown without rotation. The bacteria from this soil was isolated and grown on a unique carbon source, AFEX treated corn stover; the material left after harvesting corn. To increase probability of selecting novel bacteria several approaches were taken. The bacteria was suspended in a solution of AFEX corn stover to maximize exposure to the carbon source and placed on a dry agar plate. The plates were then placed in a hypoxic as well as an ambient environment and 11 unique isolates were discovered. To date the isolated bacteria have been examined macro and microscopically and PCR and sequencing are currently taking place. Sequencing the 16s rDNA will provide information on just how novel the samples are. If in fact novel bacteria have been isolated on AFEX corn stover it may prove to be valuable in bioenergy for several reasons; the corn stover is not a source of food or nutrition so its use does not impinge upon agriculture, as does the use of corn or soybeans. It also provides insight on the isolation of bacteria that are commonly dismissed as not viable.

MICHIGAN POLICY NETWORK

Jessica DeLoach

Mentor(s): Matt Grossman (Political Science)

I will be presenting on my participation in a morality & family applied research program to report and organize news and information about the political process surrounding Michigan state policy issues. As the Morality and Family Policy Fellow, I construct and manage a detailed website that offers, among

other things, research and updated reports on ethical and family issues as discussed in the Lansing legislature. I interpret available research, produce original documentation, track legislative and administrative actions, and write original blog entries to make this information accessible to a broad and varied audience.

EQUAL PAY FOR EQUAL PLAY: DEVELOPMENTAL CHANGE IN YOUNG CHILDRENS FAIRNESS CONCERNS AND COOPERATION

Meredith Derian-Toth, Carrie Eby, Carrie Louis, Courtney Ochalek, Ashley Schurig

Mentor(s): Cary Roseth (Counseling, Educational Psychology, and Special Education)

Economic concerns such as fairness underlie cooperative social behavior, yet little is known about the development of fairness concerns or how fairness affects young children's social relations. This experiment examined the hypothesis that young children's (ages 3.5 – 8 years-old) fairness concerns affect their feelings about potential rewards and their willingness to cooperate with an adult experimenter. Using an economic decision-making paradigm called the "Trading Game," an adult experimenter asked random pairs of same-sex, same-age children to trade paper tokens for proffered rewards (stickers). In the equality-high condition, children were offered the same number of stickers (6 stickers each), and the other conditions varied as follows: inequality = different rewards (1 vs. 6 stickers), equality-low = same but minimal reward (1 sticker each). Results supported our hypotheses, with fairness concerns expressed as sadness and unwillingness to exchange being greater under the inequality condition compared to equality control conditions. Results also showed age-related change in fairness-related processes, with older children showing more sadness and unwillingness to exchange in response to unequal rewards. This experiment clarifies how young children's cooperative decision-making is affected by age, peer context and perceptions of inequality. Understanding these processes helps to clarify the developmental roots of adult's economic decisions involving fairness concerns and the willingness to exchange cooperation for potential rewards.

STATISTICAL PROPERTIES IN DETERMINING THE APPLICATION OF 'TALL' AND 'SHORT'

Karl DeVries, Braden Leinbach

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

This experiment examines children's and adult's use of scalar adjectives 'tall' and 'short' and adjustment in response to statistical properties of a population of novel items. Scalar adjectives are interesting, because in addition to having a core meaning scalar adjectives are always evaluated relative to some set. For example, tall for a person is not tall for a building. We use a pointing task to determine how children and adults respond to populations of made-up creatures with identical means and medians, but different standard deviations. We hypothesize that 'tall' will have a shorter minimum height for populations with smaller standard deviations. The results will help us better understand the meanings of scalar adjectives, the environmental information used in determining if a novel item is 'tall' or 'short', and differences in adult and child use of scales and contextually determined standards.

DISTINCT AUTOANTIBODY SUBTYPE PROFILES CORRELATE WITH DEFINED CLINICAL SUBGROUPS IN PEMPHIGUS VULGARIS

Maulik Dhandha

Mentor(s): Animesh Sinha (Division of Dermatology and Cutaneous Sciences)

Pemphigus vulgaris (PV) is a chronic autoimmune skin blistering disorder in which the primary target of self-directed immunoglobulins (Ig) is desmoglein 3 (Dsg3), a transmembrane adhesion molecule critical for the maintenance of epidermal integrity. No previous studies have addressed anti-Dsg3 Ig-subtype correlation with defined variable (disease phase, morphology, age, duration) and constant (HLA-type, gender, age of onset) clinical parameters. In this study, we analyzed anti-Dsg3 IgA, IgM, IgG1, -2, -3 and -4 levels by ELISA in 196 serum samples obtained from 95 patients and 70 serum samples from 59 HLA-matched and -unmatched controls. PV patients had significantly higher anti-Dsg3 IgG4 and IgG1 levels than controls. As expected, anti-Dsg3 IgG4 and IgG1 levels in active disease were significantly higher when compared to remission ($p=0.0001$ and $p=0.002$, respectively; Kruskal-Wallis test). Interestingly, anti-Dsg3 IgG2 levels were also significantly elevated during active disease ($p=0.006$). Furthermore, patients with a history of mucocutaneous and mucosal only lesions had increased anti-Dsg3 IgG4, when compared to patients with a history of cutaneous only lesions. While the age at sampling did not influence anti-Dsg3 Ig levels, IgG4 levels were significantly increased with increasing disease duration ($<2y$ vs. $>10y$; $p=0.03$). In addition, patients carrying the disease associated HLA alleles DRB1*0402 and DQB1*0503 had significantly higher anti-Dsg3 IgG4 levels than carriers of other HLA alleles ($p=0.034$). In summary, our data demonstrate a correlation of Ig-subtypes with distinct disease parameters, and provide insights into the immune dysregulation leading to clinical disease in PV.

MENTAL HEALTH CONCERNS OF FOSTER CARE ALUMNI

Alicia Diebold

Mentor(s): Angelique Day (Social Work), John Seita (Social Work)

Every year, one third of the twenty thousand young adults who age out of the foster care system have evidence of mental health problems, alcohol or substance abuse problems, and major depression (Krinsky, 2007). Research is currently being done at Michigan State University analyzing the health concerns of people who were in the foster care system, along with challenges they face accessing and receiving health care. People who exit the foster care system are at a greater risk of having health problems and face more challenges accessing medical care than people not in the foster care system. This is due to the risk factors that result in children being placed in the foster care system, the stress and trauma involved with being taken out of one's home, placement instability, and the lack of physical and mental health care services available to children while in foster care. Seventy-two transcripts from individual and group interviews were coded and analyzed for similar themes. One of the themes involved mental health concerns, and accessibility to mental health care.

THE BROWN HYENA

Jonathan Diedrich, Katherine Grambaugh, Erin Linderman

Mentor(s): Kay Holekamp (Zoology), Barb Lundrigan (Zoology)

The brown hyena is a medium-sized, dog-like animal with long, well developed forequarters, weak hind legs, and a sloping back. Also, brown hyenas are shaggy and dark brown to black but are white around the neck and on the shoulders and have light underparts. Their ears are long and pointed and their lower forefeet have white stripes. These white stripes act almost as fingerprints, meaning that they can be identified by the stripes on their legs. They are commonly found in regions of Angola, Botswana, Lesotho, Malawi, Mozambique, South Africa, Swaziland, Zimbabwe, and Namibia. The brown hyenas reside mostly in arid deserts and on the coasts. The brown hyenas have an unusual way of marking their territory. To mark its territory, the brown hyena deposits anal secretions at latrine spots. This process is known as "pasting". Two secretions are deposited; a dark smear composed mainly of lipo-fuscin from apocrine tissue and, below it, a white blob, rich in lipid. The two substances leave distinct smells that can last up to 30 days. The secretions differentiate the clans and territories. Brown hyena skulls have adapted over the years to be more efficient for breaking bones to obtain the

nutritious marrow in the bone. Some morphological adaptations that are important are the conical third premolar for bone consumption and more rounded canines to prevent the risk of tooth fracture while consuming carrion.

EFFECT OF SOCIAL FACILITATION ON DEVELOPMENT OF FOOD PREFERENCE AND ACCEPTANCE IN YOUNG BEEF CATTLE

May Dik

Mentor(s): Janice Siegford (Animal Science)

Feed preferences of young animals are influenced by social interactions with their dams. These preferences can be long lasting and may affect the young animal's response to other feeds in the future. However, little is known about the relative strengths of innate versus learned feed preferences. We hypothesized that calves exposed to flavored grain would prefer the same flavor at testing, and that calves fed unflavored grain would prefer either cherry or onion concentrates equally. Six cow-calf pairs, were divided into three treatment groups and exposed to cherry-flavored (n = 2), onion-flavored (n = 2) or plain grain (n = 2) over 22 days. Calves were then individually tested in a test pen containing one trough with cherry-flavored and one with onion-flavored grain to see if they developed a flavor preference. Observation of latency to eat, time spent eating, and flavor preferences were recorded. Within twenty seconds most calves had chosen a trough and spent most of the test period eating. Five of the six calves chose cherry-flavored grain first. Three of these calves also consumed the onion-flavored grain. One onion-trained calf consumed no grain, but grazed during the test. Although calves were pre-exposed to different flavors, cherry may be innately preferred over onion. Acceptance of grain on the first day of exposure was far less than on the day of testing. This leads us to believe that exposure of calves to flavored concentrates may result in consumption of grain in general.

CHILDCARE AFTER WELFARE REFORM

Nicole Dingwell

Mentor(s): Marya Sosulski (Social Work)

With President Clinton's 1996 Personal Responsibility and Work Opportunity Reconciliation Act came discord for mothers on welfare who were trying to raise their kids and either start or complete their post secondary education. Utilizing transcripts from the Illinois Family Studies Access To Education Project gathered in 2002, real life situations regarding how the 1996 welfare reform affected women, their children and families is gathered. Several themes occur across the interviews including the quality of child care the women had access to, how accessible it was and if the women, while working in the low skill employment opportunities presented to them actually moved ahead economically with the addition of child care expenses. Many of the women indicate they were unable to access the level of care for their children that they wanted, in some cases there were consequences of the poor quality of care and most women felt that their family values were being disregarded in order to comply with welfare requirements.

SCALE COMPETITION AND CHILDREN'S UNDERSTANDING OF GRADABLE ADJECTIVES

Thao Dinh, Carolyn Blanco, Megan Sutton

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

Gradable adjectives, such as "tall" and "short" or "big" and "small", serve to place the objects they modify onto certain scales of varying degree. However, previous research has shown that when children are asked to judge which objects are tall or short in an array, they would sometimes refuse to identify the shortest object as short; instead, they would call them small or little. This suggests that the two pairs of adjectives (tall/short vs. big/small) belong to different groups of scalar adjectives: "tall" and "short" seem to refer to size on a single dimension, while adjectives like "big" and "small" are underspecified and take multiple dimensions into consideration. In this study, we investigate this property more thoroughly by creating an experiment where children will be asked to pick out objects based on their sizes, but one object in the set will match either both big and tall or short and small. In contrast, another object will only match the adjective that is less specific with regards to dimension. We hypothesize that as the size of this distractor object varies, children will also vary their choice of which object satisfies the one-dimensional description (tall/short) or the multidimensional description (big/small).

TESTING SIZE AS AN IMPLICIT RESTRICTION ON THE DEFINITE ARTICLE IN CHILD LANGUAGE

Erin Dixon, Lindsey Bird, Jessica Zwirner

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

The acquisition of one's first language is achieved by the age of five, but how this is achieved is not yet fully understood. One of the many things that need to be learned is what the definite article "the" means. The definite article picks out a specific item in a group, or the group as a whole. Suppose there is a line of three frogs next to a house. "The frogs next to the house" would pick out all of the frogs next to the house. "The frog next to the house" picks out the specific frog closest to the house. The word "closest" is understood through context and is therefore implicit and not stated. The child must make a decision based on context. Previous research showed that children would often select the frog closest to themselves rather than the one closest to the house in this situation. Here we investigate what kinds of restrictions children use to form such implicit restrictions. By changing the sizes of specific objects, we are testing whether children will use size as an implicit restriction. We will ask children to point to specific objects situated in various size arrangements in both singular and plural contexts. Depending upon whether or not the size is a motivating factor in their choices will explain whether or not the children make the correct implicit restriction.

INVESTIGATION OF THE GENETIC BASIS OF COBALAMIN MALABSORPTION IN HUNGARIAN KOMONDORS

Stacie Dodgson

Mentor(s): John Fyfe (MMG)

Inherited selective malabsorption of cobalamin (vitamin B12), known as Imerslund-Gräsbeck syndrome (I-GS), is an autosomal recessive disorder that has been found in a variety of geographically distinct families in humans, as well as in families of giant schnauzers and Australian shepherds. There are three genes implicated in the various incidences of I-GS: amnionless (AMN), cubulin (CUBN), and intrinsic factor (IF). Amnionless and cubulin are subunits of a receptor, known as cubam, which facilitates the absorption of cobalamin in the intestine and reabsorption of specific proteins in renal tubules. AMN was previously shown to contain the causative mutation in both canine families mentioned. We are currently investigating the genetic basis of I-GS in a kindred of Hungarian komondors. The IF gene was previously ruled out as the disease gene in this family using exclusion analysis. Here, we report the further exclusion of AMN as the disease gene using exclusion analysis based on two flanking markers. Two markers in CUBN have also been genotyped, and this gene cannot be ruled out as containing the causative mutation. Thus, this work has focused on the characterization of the putative CUBN mutation underlying the I-GS phenotype. Preliminary results suggest that the quantitative production of CUBN in affected dogs is not significantly diminished, indicating that the mutation may cause a decrease in function of this protein. The elucidation of the genetic basis for this disorder will have implications for genetic testing among breeders, and may even identify a new gene involved in cobalamin absorption.

RECOMBINEERING

Lauren Dorn

Mentor(s): Todd Ciche (Microbiology)

Develop recombineering in *P.Luminescens* for gene exchange. Current gene exchange methods are inefficient, recombineering would greatly facilitate genetic manipulation. This process has worked in *Yersinia* and other enteric microbes, such as *E.Coli*; it should work in *photorhabdus*.

HEAD START EVALUATION

Kelsey Dowty, Jessica Hutta, Olivia Miller

Mentor(s): Kyunghee Lee (Social Work)

The purpose of this study is to examine the effects of Head Start enrollment on children's health outcomes. The study is based on data collected by the Capital Area Community Services Head Start Early Childhood programs (CACS) of 1,600 Head Start families across 60 Head Start programs. Specific study questions addressed are: (1) At the time of exit from the program, do health outcomes differ between those who enrolled in Head Start for 1 year and 2 years?; and (2) Do family characteristics moderate the effects of duration of enrollment? Measured outcomes include children's health outcomes (blood pressure, dental check-ups, obesity, mental health, vision, hearing, lead level) that were based on maternal interviews and doctor's records. Family characteristics consist of income, ethnicity, education, employment, language spoken at home, and parental marital status. Expected findings are that children who enrolled in Head Start for a longer period of time will have better health outcomes. Children who had more at-risk family characteristics are likely to receive more positive benefits from the program than those who had fewer at-risk family characteristics. Outcomes of the study suggest that Head Start should accept younger children and provide for longer enrollment duration.

A GENETIC ALGORITHM APPLIED TO AN AGENT BASED TRAFFIC MODEL

Matthew Durak

Mentor(s): Erik Goodman (Electrical and Computer Engineering)

Top-down conceptual models have been used in describing observed behavior in emergency situations, including "critical incidents." Agent-Based Models (ABM), in contrast, represent many "agents" interacting with each other and their environments, each according to some set of rules. ABMs can reproduce the emergent properties of systems under stress. By modeling expected behaviors of agents, alternative policies for dealing with the emergency can be compared. In this study, part of a city must be evacuated, and the policies concern controlling the traffic lights. The area to be evacuated is a grid of streets of varying numbers of lanes, including one-way streets. The agents are cars that initially drive around the city with random goals, representing normal traffic. After a specified time interval, an emergency occurs and some cars immediately change behaviors and try to leave the city. Other cars continue on to their original destination before evacuating. A genetic algorithm is used to optimize the multi-parameter policy of traffic light timing. The policies are generated and evaluated by running the ABM and observing the speed of evacuation. The better control policies undergo changes-mutation or recombination-generating new policies to test. This process tends to evolve more efficient policies. The goal of this study is to gain insight into handling of a plausible emergency situation by using a genetic algorithm to optimize the control policy. This methodology can be applied to other situations that are suitable for ABM.

THE VARIATION IN THE NUMBER OF FACETS IN THE EYES OF DROSOPHILA MELANOGASTER

Anna Dvorak

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

Fruit flies are an important experimental subject in genetics due to their small size, short reproductive time, and low cost. One trait that is often traced through generations is eye-shape. In this experiment bar-eyed flies were crossed with those with round eyes. The resulting F1 generation had flies with round, bar, and heart shaped eyes. However, unlike most fruit fly crosses we were not interested in phenotype or genotype ratios, rather, how the number of facets which make up a fly's eye are related. Furthermore, are the numbers kept constant for those with the same eye shape and those with a different eye shape. We believed with slight variations in numbers of facets due to human error, the number of facets in each eye would be the same despite the eye shape. Each facet is an ommatidia and each ommatidia is composed of a set of photoreceptor neurons which detect light. Despite what many think, these multiple ommatidia do not send the same image to the fly's brain, but instead focus the light which reaches the eye into one image. These multiple views from each facet are put together into an image much like the pixels on a computer or television screen ("Secrets in a Fly's Eye"). The counts were conducted using a scanning electron microscope allowing the fly's eye to be magnified and for this image to be saved as a picture from which the facets were counted.

WHAT'S HAPPENING TO UGANDA'S CHILDREN? THE EFFECTS OF WAR ON YOUTH CULTURE IN NORTHERN UGANDA

Yvette Efevbera

Mentor(s): Linda Racioppi (James Madison College)

War, or violent conflict, has a negative effect on societies. Children are particularly vulnerable, as their development, childhood, and adolescence have been significantly shaped by the influences of war. More than 2 million children have died, 20 million have become displaced, and 300,000 act as child soldiers as a result of war. The consequent social, economic, cultural, and psychological experiences have significantly impacted the culture of young people. Through redefining culture as dynamic psychological and social experiences that are shared throughout a population and shaped by internal and external forces, this research examines the role that war plays in redefining youth culture in the war-torn region of Acholiland, Northern Uganda. This question is explored through conceptualizing Acholi youth culture prior to the Lords Resistance Army-led rebellion and examining how this violent conflict has influenced the safety, education, livelihood, health, and psychosocial dynamics of children over the past 22 years. This research deductively concludes that Acholi culture at large, and its subset of youth culture, have been altered socially, economically, and politically. War has re-imagined a culture once characterized as safe, family-oriented, and independent, recreating the boundaries of "right" and "wrong" and forcing children to define and adapt new goals. If peace, stability, and prosperity are ever to return to the Northern region of Uganda and other war-torn regions, the profound impact of war on the culture of children must be understood to create the most appropriate responses.

DETERMINING CONTINUOUS SNOW THERMAL CHARACTERISTICS WITH A NOVEL SNOW THICKNESS GAUGE

Jeffrey Eggleston

Mentor(s): David Hyndman (Geological Sciences)

Snow pack levels are an important factor in determining winter soil temperature. A thick snow pack insulates the soil and keeps the water in the soil from freezing. This freezing reduces the permeability of the soil. Therefore, thicker snow layers allow a greater amount of spring snowmelt to infiltrate and recharge the groundwater. Climate change might have a significant impact on the interactions between snow pack levels and soil temperature. Climate

change will likely increase regional temperatures, which may lead to greater snowfalls but more frequent snow melt, reducing the insulation for the soil. Existing snow depth measuring instruments are expensive, limiting their usefulness for studying snow pack variations over large areas. To overcome this problem, we created our own snow probes using a series of temperature sensors arranged along a vertical pole. The probes were installed at several locations in mid and northwestern Michigan in mostly forested areas. In each location where the snow probes were placed there were also pre-existing devices that measured soil moisture and soil temperature. Comparing the information provided by the snow probes to the soil temperature and moisture probes we evaluate the effectiveness of the insulation provided by the snow pack.

ANALYSIS OF VEGETATED FILTER STRIPS IN TREATMENT OF AGRICULTURAL RUNOFF

Alyse Egner

Mentor(s): Becky Larson (Biosystems Engineering), Steven Safferman (Biosystems & Agricultural Engineering)

Non-point source pollution from agricultural runoff results from the flow of water over impervious surfaces that have accumulated animal feed or waste. Agricultural runoff pollutes ground and surface water causing potential environmental and health hazards. It is a source of eutrophication and contamination in surface water, and metal mobilization in ground water. Vegetated filter strips have the potential to reduce these pollutant concentrations from feedlot runoff. The objective of this study is to evaluate the effectiveness of vegetated filter strips to treat feedlot runoff to concentrations which pose no environmental risk to ground or surface waters for varying seasons and environmental conditions. The filter strips have been constructed at the MSU Dairy Farm, and will be evaluated by their ability to be an effective agricultural treatment/management option, consistently meet MDEQ standards, and maintain treatment consistency throughout seasons and varying rainfall events.

GEOGRAPHIC RACIAL EQUALITY: BLACKS VERSUS WHITES IN THE COUNTIES OF NEW YORK

Lara Ejups

Mentor(s): Joseph Darden (Geography)

According to previous research there has been a continuous and constant tension between blacks and whites with reference to the inequality of income, occupation, education and residential segregation. This paper's objective is to determine if any of the municipalities in Nassau, Suffolk and Albany Counties in New York State have achieved geographic racial equality between blacks and whites. It was hypothesized that none of the municipalities in Nassau and Suffolk Counties had achieved geographic racial equality. The data source was the 2000 US Bureau of the Census Summary File 4. The methods used were ratio comparisons between the groups to assess income, education and occupational similarities. The index of dissimilarity based on census tracts was used to measure whether a low (below 50%) level of residential segregation existed. Results showed that no municipality in Nassau and Suffolk Counties has achieved geographic racial equality. However, further research found that one municipality, named Guilderland Town, in Albany County New York was an area that had achieved geographic racial equality. Therefore, the hypothesis was accepted.

ENTERTAINMENT AND CULTURE IN MOROCCO AND CANADA

Lisa Ermak, Jessica Dupnack, Bob Healy, Steve Kelm, Carole Polan

Mentor(s): Folu Ogundimu (Journalism)

Globalization has had monumental impacts on many aspects of society, as it has opened doors for technological progress, helped to create a global marketplace but most importantly, it has widened our view of the world, allowing us to communicate locally, nationally and globally. For our research we decided to focus on Morocco and Canada and the way in which entertainment and culture have found their place in the global environment. Since Canada is a developed nation, while Morocco is a less developed country, we plan on uncovering the ways these two radically different nations are impacting and drawing influences from the entertainment and culture of other regions. We will take a critical look at Morocco and Canada's cultural icons, sports, music, literature and dress. We will also be analyzing the way in which entertainment and culture are covered by the media and how the global media impacts the way in which these countries see themselves in today's globalized world.

THE STING OF ASIA'S 'GRANARY': ADMINISTRATIVE AND ECONOMIC INCONGRUENCIES WITH THE ENVIRONMENT IN JAPANESE MANCHURIA

Ryan Etcorn

Mentor(s): Michael Lewis (History)

On September 18th, 1931, Japanese forces stormed the city of Mukden and quickly overran Chinese troops throughout the massive region of Manchuria, provoking international denunciation and the establishment of a 14 year semi-independent state: Manchoukuo. The Japanese however, had invested in this land since the close of the Russo-Japanese war in 1905, insatiably drawn to the region in large part by its abundance in natural resources and strategic geographic placement in the eastern edge of the Asian continent, but by 1945 the dream of Japan's everlasting resource base had faded. There can be no doubt that the environmental realities of the land most commonly known as Manchuria played a pivotal role in the formation of Japanese economic policy and its political consequences. This essay will analyze the gravitational center of environment in the three major historical forces of geographic time-space shrinkage, agriculture, and demography as dominant in the history of the Japanese influence in Manchuria. The Japanese takeover in 1931, paired with the debilitating Great Depression, witnessed a turn from the agricultural momentum afforded by history and nature towards an industrial fixation that would doom Japan in its late attempt at war-time economic recovery. As Japan stood transfixed on its continental holdings across the Yellow Sea and their potential for customary Japanese "hot house" capitalism, the sharp sting of environmental resistance in such an agriculturally oriented land made it flinch and turn - only to discover that it was already too late.

I PROBABLY WOULD PUT PROBABLY SECOND: PRE-AUXILIARY ADVERBS IN AMERICAN ENGLISH

August Evrard, Malcom Doering, Katie Fraser, Samatha Giuffre

Mentor(s): Jan Anderssen (Linguistics and Languages), Suzanne Wagner (Linguistics and Languages)

There are many obvious differences between American English and British English, particularly in the lexicon (pants~trousers, sidewalk~pavement) and in phonology (tomato~tomahto). However, differences in the syntax of these two varieties tend to be less salient and have been subject to less investigation. The current project looks at a word-order option that is available to speakers of American English but not to speakers of British English. In the USA, speakers/writers can put an adverb (such as definitely, also, still) before an auxiliary verb or copula be, as in John still could win the race. This occurs much less frequently than the canonical John could still win the race, but more frequently than in Britain, where it appears not to exist at all. We are looking not only at the rate of use of this word order in general, but also the frequency of certain adverb-auxiliary pairs. Our research utilizes both corpus based and experimental methods to gather data from a wide range of written and oral sources, and to discover any social and linguistic constraints. This project has been built from the ground up, with the only previous study having been done in the 1970's, when corpus methodology was unrefined and controversial in the field of linguistics. This new study will shed light on and bring further attention to this little-noticed difference, and provide the basis for further inquiry and understanding.

METAL AND SUBSTITUENT DEPENDENCE OF COORDINATION POLYMER STRUCTURE INCORPORATING ALKYL MALONATE LIGANDS AND A KINKED ORGANODIIMINE

Gregory Farnum

Mentor(s): Robert Laduca (Chemistry)

A family of substituted malonate coordination polymers incorporating divalent metal centers and the kinked, hydrogen bond capable organodiimine DPA (4,4'-dipyridylamine) have been prepared via solvent diffusion methods. $\{[Cu_2(dmmal)_2(dpa)_3](ClO_4)_2 \cdot 2H_2O\}$ (1) (dmmal=dimethylmalonate) exhibits a cationic three-dimensional framework in which the unique malonate copper layers in addition to the tethering DPA create a unique crystallographic topology. $\{[Cd_2(dmmal)_2(dpa)](ClO_4) \cdot 6H_2O\}$ (2) possesses two-dimensional cationic herringbone layers. $\{[Cu(mmal)_2(dpa)] \cdot H_2O\}$ (3) (mmal=methylmalonate) forms one-dimensional chains through linking malonates, while chain aggregation occurs by hydrogen bonding. $\{[Co(dmmal)_2(dpa)_2] \cdot 6H_2O\}$ (4) is a molecular species consisting of a single divalent cobalt center with two chelating malonates and two monodentate HDBA ligands. These species form pseudo one dimensional chains through hydrogen bonding mechanisms. Antiferromagnetic coupling were observed in both 1 and 3. Compound 2 emits blue-violet light upon exposure to ultraviolet.

FEEDING PEACE: THE HISTORY OF AFRICAN FAMINE RELIEF IN THE EAST LANSING, LANSING, AND MSU COMMUNITIES

Rebecca Farnum

Mentor(s): Miguel Cabanas (Spanish and Portuguese), Steve Sharra (Philosophy)

In 1974-1976, Michigan State University and the East Lansing and Lansing communities collaborated in order to work towards African Famine Relief. A registered student organization (RSO) was created on campus and worked closely with community activists and the Peace Education Center (PEC). The culmination of their efforts was several 'Fast Days' in the community and on campus. The PEC committee and RSO worked with the Michigan State University Housing Department to allow students to skip a meal and have their meal plan money donated to the African Famine Relief Drive. At the same time, Michigan State University and the Lansing Communities developed several new educational programs related to world hunger. New connections with national and international organizations were created and relationships with several African countries forged. The purpose of this research initiative is interdisciplinary in nature, involving archival investigation of records and a socio-political analysis of the role of different organizations and institutions to promote fundamental economic justice in African countries. I will contextualize this study within the national realities of the time and their global resonances. Historic, economic, and political research focus questions will be explored from a peace and justice perspective.

MICROARRAY ANALYSIS OF INDUCIBLE MIXED-LINEAGE KINASE 3 MCF10A CELLS

Mohammad Fassia

Mentor(s): Kathleen Gallo (Biochemistry)

Mixed-lineage kinases (MLKs) are mammalian protein kinases that play critical roles in mitogen-activated protein kinase (MAPK) signaling pathways. MLK3 is activated by the small GTPase, Cdc42. Our lab has demonstrated that increased induction of MLK3 in MCF10A cells results in increased cell motility. Studies at the Netherlands Cancer Institute have also identified a set of sixty genes, through microarray analysis, that are used as a predictor for a tumor's probability to metastasize. The purpose of this study is to determine gene expression levels of inducible MLK3 MCF10A cells using microarray analysis and contrast these genes to the sixty genes identified for metastatic cancer prognosis. MCF10A cells were first infected with a retrovirus containing the transcription factor and target gene vector for inducible MLK3 expression. The MCF10A cells were then selected by using media containing G418 and hygromycin. These cells were then induced for MLK3 expression using AP 21967 and had their expression levels determined through immunoblotting. We are currently working to analyze the gene expression levels of the inducible MLK3 MCF10A cells through microarray analysis.

FUNCTIONAL MRI USING VASCULAR SPACE OCCUPANCY (VASO) AND VASCULAR SPACE OCCUPANCY WITH TISSUE SUPPRESSION (VAST)

Alyssa Fedorko, Tiara Ahmad, Sagal Ali, Leah Hill, Ashlee Prince, I Rin

Mentor(s): Ronald Meyer (Radiology), Jill Slade (Radiology), Robert Wiseman (Radiology)

When one uses his or her muscle or brain, blood flow to that tissue increases. Functional MRI studies take advantage of these differences in blood flow, and associated differences in blood volume, to map where the activity occurs. The actual increase in the blood volume is very hard to pinpoint, especially with the noninvasive methods more commonly used for functional MRI, which depend more on blood oxygenation (the BOLD effect) than blood volume. There are, however, two new MRI techniques which may be used to accurately measure this increase in blood volume. The first method, known as VASO, involves suppressing the signal from the blood. Thus, one can determine the blood volume increase by examining the suppressed signal. The second method, called VAST, suppresses the tissue so that the increase in blood volume can, in principle, be directly measured. We will be combining these two methods to more accurately measure the increase in blood volume in skeletal muscle after exercise. Specifically, we will use VASO and VAST, and we will also gather data by suppressing other signals. Eventually, we will be able to get a direct measurement of the increase in blood volume. We hope to extend this for use in studies of the brain. When a mental task is performed, there is an increase in cerebral blood volume in a corresponding area of the brain.

UNIVERSITY-INDUSTRY LINKAGES: A TAXONOMY

Danielle Ferry

Mentor(s): Ross Emmett (Political Theory), Bryan Ritchie (International Relations)

In the absence of a generalizable method for examining and comparing university-industry partnerships, scholars have used frameworks based upon case-specific variables, creating a chaotic and disorganized literature. We present a taxonomy of university-industry partnerships, based on the assumption that such partnerships accomplish all (or part) of the three tasks of the innovation process: discovering, de-risking, and commercialization. The taxonomy is then built upon four variables which enable a scholar to identify the context within which the partnership operates: government, financing, labor and capital markets, and IP structure.

APLITE DIKES AT ELLIOT LAKE, ONTARIO, CANADA AND THEIR EFFECT ON URANIUM MINERALIZATION

Valerie Finlayson

Mentor(s): Tyrone Rooney (Geology)

Uranium prospect drilling at Elliot Lake, Ontario, Canada revealed the presence of a series of previously-unknown aplite dikes intruding into the late Archean quartz pebble conglomerate Matinenda Formation of the Huronian Supergroup. Historically, uranium deposits in the area are paleopacer in nature and found in the Matinenda Fm. and constrained by the Quirke Lake synclinal structure dominating the region. Some of the dikes are radioactive, suggesting remobilization of uranyl ions, possibly as a result of hydrothermal circulation generated by intrusion of the dikes. Drill core logs suggest a

relationship between proximity of uranium-containing bedrock and the presence of uranium in dike samples. Non-radioactive samples of the dikes, granitic in nature and exhibiting color variations from white to pink to grey, will undergo petrographic and mineralogical analysis to evaluate mineral formation of the dike material and possible mineralogical influences from existing bedrock. If possible, any existing hydrothermal alteration of minerals will be analyzed. Zircons and monazites retrieved from dike material. Geochemical analysis performed by XRF and laser ablation ICPMS will reveal trace and major element distribution, which can then be compared to the chemical signatures of known and previously-studied granitic bodies proximal to the Elliot Lake region. Aplite samples will be compared to a sample of the quartz pebble conglomerate into which it intruded. Further analysis of the Elliot Lake samples is expected to result in the development of a new model for the formation of uranium-bearing materials in the region, which may have implications for future uranium exploration and mining.

SPINE INDUCTION OF THE SPINY WATER FLEA (BYTHOTREPHES LONGIMANUS)

Jason Fischer

Mentor(s): Scott Peacor (Fisheries and Wildlife)

Phenotypic plasticity in morphology, life history, or behavior can benefit organisms in variable environments. Plasticity enables organisms to develop traits adaptive to specific environmental conditions and to not develop those traits when conditions change. A spine such as that of the spiny water flea (*Bythotrephes longimanus*) can act as a deterrent to fish predation. However, spines require considerable energy to produce and may be costly during low fish predation. We hypothesized that *Bythotrephes* displays plasticity of tail spine dimensions (i.e. length and width) in response to fish presence. We predicted that in the presence of fish, *Bythotrephes* would produce longer and thicker spines than those of *Bythotrephes* not exposed to fish. To test this prediction, *Bythotrephes* were reared under laboratory conditions simulating presence and absence of fish. Morphological measurements were then taken to determine the differences in the spine dimensions between the two treatments. Interestingly, the results show significant differences opposite to our predictions. The spine base width relative to body size of *Bythotrephes* reared without fish cues was 20% larger than that of *Bythotrephes* reared with fish cues (p -value=0.022). However, differences between other attributes were of little or no significant difference. To fully decipher *Bythotrephes*' response to fish, further research must be conducted. Determining *Bythotrephes*' ability to respond plastically to fish will improve knowledge of food web interactions as well as improve the power of models investigating the food web dynamics of the Great Lakes.

EFFECTS OF DIETARY COMPOUNDS ON PROLIFERATION IN AN INTESTINAL CELL CULTURE MODEL

Brenna Fitzgerald

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

Colon cancer is one of the leading causes of lifestyle-related morbidity in the United States. Dietary factors are closely linked to the development of colon cancer but little is known about the mechanisms of action. We hypothesized that specific diet-related compounds would reduce insulin-induced cell proliferation, a hallmark of cancer progression. We treated normal murine colon epithelial cells (YAMC) and tumor cells (MC-38) with diet derived compounds shown in the literature to decrease the risk of colon cancer. The compounds are thought to act by reducing inflammation through antioxidant properties. Compounds chosen were curcumin and docosahexaenoic acid (DHA; omega-3 fatty acid). In addition, we stimulated cell proliferation with insulin (1 μ g/mL). Despite the presence of insulin, proliferation was reduced in the MC-38 cells treated with 10 μ M curcumin (p <0.001) and 50 μ M DHA (p <0.001). In the YAMC cells, neither curcumin nor DHA reduced the insulin-induced proliferation.

USABILITY AND ACCEPTANCE OF A CONVERSATIONAL IN-CAR SPOKEN DIALOGUE SYSTEM

Carly Fleming

Mentor(s): Constantinos Coursaris (Telecommunications)

There has been a recent surge in the development of spoken dialogue systems, mainly regarding use as in-car systems. Much of the research focuses on technologically developing these devices to help minimize driving distraction. These systems complete tasks ranging from temperature control within the vehicle, monitoring the speed, and directing the driver via GPS navigation. Researchers have questioned whether the most technologically advanced systems also produce the greatest usability. It has also been questioned whether such factors as user expectation and user satisfaction with a particular system lead to greater usability than the particular technology itself. It is the goal of this proposed research to identify an existing correlation between user expectation, user satisfaction, and usability of an in-car spoken dialogue system. This proposed research would study the preferences of different consumers regarding spoken dialogue systems, as well as the effect of those expectations on actual user performance. Furthermore, it would also compare the user satisfaction rate with actual performance. After participants of this study test drive a vehicle while using a system closely aligned to their expectations, as well as with a system that is not aligned with expectations, the effects on user performance can be compared. It is the goal of this project to determine if user satisfaction and user expectation have a greater impact on driver performance (effectively decreasing driving distractions) than previously expected.

BIOPLASTICS

Rebecca Frear

Mentor(s): Ramani Narayan (Chemical Engineering)

Crop based oils can provide a platform for chemical transformation to biobased monomers and plastics. BioPlastics using renewable carbon offers the intrinsic value proposition of a reduced carbon footprint depending on the amount of renewable carbon in the product and in harmony with the rates and time constants of the natural biological carbon cycle. In the present research, we have functionalized soybean oil with maleic anhydride to form maleated soybean oil via a radical-initiated Diels Alder reaction. The functionalized oil can be reacted with starch and cellulose and other biopolymers to give soybean oil grafted products, which offers unique flexibility and performance properties. The maleated soybean oil was characterized through iodine analysis, FT-IR and NMR.

UNDERGRADUATE FOOD PREFERENCES IN YAKELEY DINING HALL

Kirsten Freiburger, Colin Pahl

Mentor(s): Laurie Thorp (RISE)

With growing interest among colleges and universities nationwide to be good stewards of the environment, some campus food service providers are looking to provide an increased percentage of environmentally friendly food choices as a way to manage their ecological footprint. The authors of this study examined college student cafeteria food preferences, attitudes and behaviors to understand if personal motives were aligned with a campus "greening" initiative. At the beginning of Fall Semester 2008, focus groups were conducted including a dot survey and questionnaire. At the end of the semester, intercept surveys and another round of dot surveys were conducted. Results confirmed findings of other surveys related to consumer food preferences, that is: 1) human health, 2) taste, 3) price and 4) appearance, emerged as most important factors when making food choices. Other factors

such as concerns about animal welfare and specific ingredients were also determinants in food selection. Students indicated they were unwilling to pay more for organically produced food as part of their meal plan. Students expressed a desire for improved labeling of dining options for ease in identification of nutritional facts and allergies. Students preferred Michigan grown foods to locally grown foods. Over 75% of students surveyed have tried the MSU Student Organic Farm greens supplied in the Yakeley Dining Hall. 60% of these students ate them on a weekly basis based on 1) taste, 2) freshness and 3) health.

WEAR PROPERTIES AND BIOCOMPATIBILITY OF AMORPHOUS DIAMOND-LIKE CARBON COATINGS FOR IMPROVED ORTHOPEDIC IMPLANTS

Robert Friederichs

Mentor(s): Melissa Baumann (CHEMS/Honors College)

The more active (and paradoxically obese) baby boomer generation along with relatively short implant lifetimes (10-15 years) have created a demand for longer lasting implants. Revision surgeries, which are costly and pose a risk to the patient, are required when an implant fails. Increasing implant lifetimes by making them more wear resistant eliminates the need for revision surgeries. Amorphous diamond-like carbon (DLC) is an extremely wear resistant material that can be coated via physical vapor deposition (PVD) onto substrates (including industry standard implant alloys). A novel hydrogen-free tetragonally bonded (ta-C) amorphous DLC coating developed by the Fraunhofer Center at MSU is the focus of a collaborative ongoing study involving MSU Engineering faculty. Wear properties and in vitro biocompatibility of the ta-C coating deposited on industry standard alloys were investigated. Engineers at Fraunhofer evaluated the wear properties of the ta-C coating, while MSU faculty ran the biocompatibility tests. The wear results showed that the ta-C coating has superior wear properties. Standard biocompatibility assays run using osteoblasts (bone forming cells). These assays included cell attachment (4 hours), Live/Dead viability assay (24 hours) and scanning electron microscopy of cell morphology. Results indicated the in vitro biocompatibility of the ta-C coatings on industry standard implant alloy substrates. These ta-C coatings show significant promise as a wear surface in orthopedic implants.

THE EFFECTS OF INTERNET EXPERIENCE ON CHILDREN'S PERCEPTIONS OF INFORMATION

James Gabriels, Danielle Brimmeier

Mentor(s): Judith Danovitch (Psychology)

Search engines like Google.com can provide quick and relatively accurate information to users on a wide variety of topics. With more people relying on the Internet for information, it is important to understand the effects that Internet use has upon cognition. Little research has been done on this topic, especially among psychologists. The aim of this study is to understand individuals' perceptions of information and how those perceptions are affected by Internet experience. We hypothesize that individuals with higher levels of Internet experience will indicate that they are able to find more information faster, and with greater accuracy than less experienced users. Using structured interviews, we will present data gathered from 8-12 year olds. In the study participants are asked a series of questions. For each question participants must first determine if the question is answerable. If the participant believes it is answerable, they are then instructed to make judgments about how quickly and accurately the answer could theoretically be found. The questions include factual, procedural, and personal questions. In addition to this task, the participants are asked a second set of questions about their degree of Internet familiarity and usage. Our results will identify how the Internet is affecting children's perception of information, which would be beneficial for future research on the consequences of Internet use.

DISCOVERING NEW MOLECULAR PATHWAYS IN THE REGULATION OF APOPTOSIS IN ALVEOLAR EPITHELIAL CELLS

Xu Gao

Mentor(s): Bruce Uhal (Physiology)

An important step in lung fibrosis is the apoptosis of Alveolar Epithelial Cells (AEC), which can be activated by Angiotensin II (ANGII). The purpose of this study was to discover the pathways through which apoptosis of AECs are activated by ANGI. We found that ANGI activates apoptosis through ERK activation of JNK phosphorylation. We demonstrated that after a 5-minute exposure of MLE12 cells to ANGI(10⁻⁷M), JNK phosphorylation was stimulated. However, after a 30 minute pre-incubation with PD98059, which blocks ERK phosphorylation, JNK phosphorylation was completely eliminated. Our data also showed that, when R4F was applied to MLE12 cells, ERK1/2 phosphorylation significantly increased. This activation of ERK1/2 stimulated JNK phosphorylation. Together, these data show that activation of ERK can stimulate JNK phosphorylation, leading to apoptosis of the AEC.

MICHIGAN POLICY NETWORK

Shawn Gillingham

Mentor(s): Matthew Grossmann (Political Science)

My work involves participation in the Michigan Policy Network, a combination web database and research project focusing on collecting and organizing news and information regarding the political process as it relates to Michigan state policy issues, developed by Professor Matt Grossmann and his associates Daniel Bergan and Mark Axelrod. The MPN exists as a first-of-its-kind web site with content generated primarily by students, covering a range of topics including education, health, agriculture, urban affairs, and labor and the economy. As Employment Policy Fellow, articles and items of interest concerning all aspects of labor issues and some of their economic relations would fall under my purview. I am responsible for annotating and organizing research currently available, tracking legislative and administrative actions, and composing original documentation including blog entries and transcribed and audio interviews, all with the goal of contributing to a resource to inform citizens about policy decisions relating to labor and employment policy. Overall, the project serves to increase political efficacy in Michigan residents by providing the necessary information for interested citizens to educate themselves, while offering me and the other Fellows attached to the project valuable experience in using new online technologies to promote knowledge. I consider participation in the MPN program to be a worthy academic achievement, which will help me transition from an upper-division undergraduate into desired postgraduate work by endowing me with the skills, knowledge, and contacts I can use to conduct future research.

INCIDENTAL VERSES INTENTIONAL VOCABULARY LEARNING IN A FOREIGN LANGUAGE CLASSROOM

Courtney Gluski

Mentor(s): Shawn Loewen (Linguistics and Languages)

The research I have been doing focuses on incidental versus intentional vocabulary learning in a foreign language classroom. Incidental vocabulary includes words that come up during normal class instruction and intentional words are words that are found in chapter vocabulary lists. This research is imperative in the context of a foreign language classroom for several reasons. One is that it gives insight on whether there is more learner uptake with vocabulary words that are part of the chapters theme and followed by its translation or if there is greater uptake from vocabulary used in context by the instructor. This research will provide foreign language teachers the knowledge of how to best present vocabulary during instruction to ensure the highest percentage learner uptake. To get the necessary results the students take a pre and posttest of the 27 intentional vocabulary words and on the 25

incidental vocabulary words. The classes were then audio recorded and transcribed. The results showed that there was an overall higher average gain by only .002 with the vocabulary that was intentionally taught. I will have graphs that display the gain differences between intentional and incidental vocabulary as well as frequency the vocabulary throughout the semester.

SOVIET REPRESENTATIONS OF THE TRUMAN DOCTRINE

Jenna Goins

Mentor(s): Kyle Evered (Geography)

Addressing the United States Congress on the 12th of March, 1947, President Harry S. Truman informed the country of the perceived imperative to support Greece and Turkey in their efforts aimed both at achieving development and modernization and at establishing internal stability and sovereignty in the international system of nation-states. The Soviet Union had a very distinct response to this initiative. This reaction can be seen not only in the government's official reactions, but also in the reactions of the people. This poster presents an analysis of public and popular Soviet reactions to the Truman Doctrine by examining images, editorials, and articles from Pravda, Krokodil, and other Russian sources.

CUTMARK EXAMINATIONS

Kelley Goldblatt

Mentor(s): Todd Fenton (Anthropology)

A study was designed to explore the differences between serrated and non serrated knife markings on bones. It included creating sample knife markings and examining them scientifically. Applications for this study include criminal proceedings, forensic contexts, and educational settings. Upon completion, a simple method for differentiating the two blade types was created.

DEVELOPMENT OF CRACKERS WITH A SERVING OF VEGETABLES

Nicole Goldman

Mentor(s): Janice Harte (Food Science and Human Nutrition)

The National Fruit and Vegetable Program, a partnership of several food and health-related government organizations including the CDC and USDA, recognizes the importance of fruits and vegetables in the American diet in their recommendation for at least five servings of these food groups per day. With the percentage of obese people in this country reaching alarming highs, the incorporation of vegetables into daily diets is gaining importance. Through social engineering, vegetables can be incorporated into other more accessible foods, such as snack crackers, to provide the recommended nutrients the American diet needs. In this study, snack crackers were developed to incorporate nutrients equal to one-half to a full serving of vegetables in one serving of crackers. The challenge for development is maintaining product with expected characteristics with the incorporation of dried vegetable powders - corn, tomato and spinach - into the formulation. The texture of the crackers was evaluated by a three-point break test using a TA-XT2 texture analyzer. A combination of baking time and temperature, in association with a larger reduction in moisture content during cooking, influences the hardness and brittleness of crackers. With increasing replacement of flour with vegetable powder also comes a reduction in cohesiveness, sacrificing cracker crispness and other desired textures for a more nutrient dense product. Instrumental data will be combined with results from a trained sensory panel to determine the ideal vegetable content, baking time, and temperature of crackers providing one-half to a whole serving of vegetables.

MICHIGAN POLICY NETWORK

Peter Goralski

Mentor(s): Matt Grossmann (Political Science)

The goal of this presentation will be to give an overview of the agriculture section of the Michigan Policy Network. Topics covered will include the process of news gathering as it relates to Michigan agriculture; the effectiveness of the website in disseminating said news, including which stories receive the most attention and possible explanations why; and difficulties encountered when researching various agriculturally related topics.

TRACEABILITY IN THE US VS EU FOOD CHAIN AND ITS IMPACT AT MICHIGAN STATE UNIVERSITY

Sneha Goud

Mentor(s): Tobias Schoenherr (Supply Chain Management)

Traceability refers to the ability to trace and follow a food or food product through all stages of production and distribution. This proposal is to compare current traceability conditions between the United States and European Union and use an example of the US food supply chain by tracking a product that is served widely at the campus of Michigan State University. Recommendations will be provided on the pros and cons of the current system used by the university's food distribution. In any society, traceability regulations help improve the quality of food products, increase the nutritional value, improve consumer health, prevent food borne illnesses and eventually increase producer's revenues.

ANALYSIS OF THE VIRULENCE AND VIRULENCE FACTORS OF BURKHOLDERIA CENOPEACIA BACTERIA USING THE NEMATODE CAENORHABDITIS ELEGANS AS A MODEL HOST

Richard Gray

Mentor(s): Todd Ciche (Microbiology & Molecular Genetics)

In this study I tested the virulence of 58 strains of the ubiquitous bacteria *B. cenocepacia* using the well-studied nematode *C. elegans* as a model host. The bacteria is of interest because of its wide host range and its potential to have detrimental effects ranging from damaging crops to causing severe pulmonary infections in cystic fibrosis patients. *B. cenocepacia* strains were cultured on two types of media, one designed for fast killing of *C. elegans* and one for slow killing. Two control bacteria were used, the *E. coli* strain OP50 as a positive survival control and *P. aeruginosa* as a high-virulence control. *C. elegans* were added to the cultures and their mortality was determined at 3 and 7 days after being placed on the bacteria. A range of virulence levels were found, with most strains having moderate to high virulence. The clinical isolate AU1054 was found to have extremely high virulence, significantly greater even than the high-virulence control bacteria. Transposon mutagenesis was performed on AU1054 and 14 mutants were isolated that had significantly reduced virulence (attenuated mutants). Cycle sequencing analysis of the attenuated mutants showed mutations located in a variety of genes. We are currently working to complement these mutants in order to restore their virulence, and to analyze the effect the mutation has on the bacteria beyond the loss of *C. elegans* virulence.

USING MULTIMEDIA TO ASSIST FARMERS IN INTERACTIONS WITH THE THAI COMMUNITY THROUGH THE WEB SITE SUSTAINABLE FARMER

Alisha Green

Mentor(s): Bonnie Bucqueroux (Journalism)

Sustainable agriculture promotes efforts to provide fresh, local and seasonal food to local consumers, using practices that ensure the long-term health of the planet. Sustainable farmers often market their produce through direct-marketing strategies such as farm markets, CSAs (Community-Supported Agriculture where consumers sign annual contracts for a share of a farmer's crops) and on-farm sales. When catering to the unique demands of ethnically diverse communities, farmers need an understanding of what food to grow and how to best grow it. Equally important is an understanding of potential buyers and how to best reach and interact with them. The Web site Sustainable Farmer 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. In an effort to provide detailed resources, the site focuses on individual cultures sellers may conduct business with. The UURAF project focuses on Asian food, and Thai is the first community for which an online package of information including text, links, graphics and video is offered. A video interview with the chair of the MSU University Food Systems Committee explains the importance of food in defining a culture. Thai students from the Thai Language Club, and their adviser, were also interviewed to explain details of Thai culture and offer advice for interactions with the Thai community. The video packages will be posted on Sustainable Farmer in the Catering to Cultures section to provide a valuable resource for the farm market community.

ENVIRONMENTALLY FRIENDLY PRODUCTS: IMPLEMENTING SUSTAINABLE PURCHASING IN MSU UNIVERSITY STORES

Jacqueline Greig, Gabriela Fratta, Jordan Kornack

Mentor(s): Terry Link (Office of Campus Sustainability), Steve Safferman (Natural Resources and Biosystems)

There is a lack of consumer interest and involvement in choosing eco-friendly products due to a lack of knowledge or a misperception in actual quality. There is a clear need for establishing guidelines and criteria to determine the eco-friendliness of a product and therefore, the label created must be credible and supported in order for the consumer to actively support the proposed argument. In order to increase university knowledge and involvement in purchasing and supporting more eco-friendly products and methods, we plan to establish a label system with clear set guidelines including a ranking system, more specifically, focusing on top purchased products of leading consuming departments through Michigan State University, University Stores. This will be done by analyzing and researching the manufacturing, shipping, consumption, disposal, and packaging of the aforementioned products, and as a result eventually replacing some of lesser eco-friendly products with more sustainable ones.

CRYSTALLOGRAPHIC STUDY OF COP9 SIGNALOSOME SUBUNIT 8 (CSN8)

Lauren Grenzicki

Mentor(s): Bill Henry (Biochemistry & Molecular Biology)

The COP9 signalosome (CSN) complex is composed of eight subunits and was originally discovered in *Arabidopsis* during studies of photomorphogenesis. Further studies determined that CSN is conserved across multiple eukaryotic species. In some cases, CSN contains isopeptidase activity in an ubiquitin-like pathway involving neddylation rather than ubiquitination. Mutations in *Drosophila* are lethal early in development, suggesting that the deneddylation of certain target proteins by CSN is essential to embryogenesis. Indeed, one of the subunits, CSN8, is essential to oogenesis and adult development of *Drosophila*. In both mouse and *Drosophila* cells, the lack of CSN8 blocks re-entry of the cell into the cell cycle from the G0 phase, providing a plausible pathway for disrupted developmental programs that rely on cell cycle control. Studies in adult mice also indicate that deletion of CSN8 negatively impacts the development of the CSN complex, reducing T-lymphocyte proliferation and survival. To elucidate the function of CSN8, a crystallographic study will be pursued to determine the subunit's atomic structure. A purification protocol is being developed to obtain a high yield of protein. Though earlier studies have yielded structures of a few truncated CSN subunits, pursuing studies of the full length protein will provide a better idea of the possible function of CSN8 in the CSN isopeptidase activity and its influence on the cell cycle.

THE EFFECTS OF VARIOUS LEVELS OF SCAFFOLDING ON SEVENTH GRADE STUDENTS SCIENCE LEARNING OF HEREDITY

Amanda Griffin

Mentor(s): Latonya Michelle Williams (Teacher Education)

This study examined the effects of various levels of scaffolds on students' science achievement around heredity in a Web-based Inquiry Science Environment (WISE). The types of scaffolds used included activity prompts and self-monitoring prompts. Three versions of the WISE curriculum unit were tested: one had detailed scaffolds that were continuous throughout the project; one had detailed scaffolds at the beginning that were gradually faded out; and one, the control, had no scaffolds at all. Three-hundred middle school students and two science teachers participated in this study over a period of six weeks. The main sources of data include classroom observations, pre- and post-assessments, student responses within the WISE environment, and an epistemological and relevance questionnaire administered to the students both before and after their use of the curriculum. Our preliminary data analysis indicates that there was a significant difference between students' pre- and post-test scores. In this paper, we explore the effects of the different levels of scaffolds on the quality of students' responses and student achievement scores within treatments, between the three treatments and between the two teachers.

RELATIONSHIP BETWEEN CHILDREN'S DEVELOPMENT OF WRITING AND KNOWLEDGE OF LETTERS ACROSS THE FALL SEMESTER OF PRESCHOOL

Tera Gurney

Mentor(s): Hope Gerde (Family and Child Ecology)

Writing is an important component of children's literacy development (Whitehurst and Lonigan, 1998). Writing one's name is a meaningful way for young children to use writing. Name writing has been used to assess children's literacy sophistication and cognitive development (Bloodgood, 1999). Further, writing has been identified as a helpful instructional tool in teaching children about letters (Diamond, Gerde, & Powell, 2008). The present study examines the relationship between the letters children are able to produce when writing their name and the letters children recognize. Also examined is how children's knowledge of letters and writing ability improve over time. Participants include 168 3-5-year-old children attending the Michigan State University Child Development Laboratories. Data were collected at two times during the school year. Children were tested individually by trained undergraduate research assistants. Classroom teachers provided researchers with children's name writing samples. Teachers asked children to "write your name on this paper." Name writing samples were coded using a 9-point scale (1= scribbling to 9= complete name spelled correctly) by two trained researchers reaching inter-rater reliability ($k=.94$). Also, children's writing process (directionality, linearity, and case) was coded. Results describe what name writing looks like for young children, how children increase in their name writing sophistication across the fall semester of preschool, and how children's name writing relates to children's knowledge of letters. The results of this study contribute to our understanding of the importance of writing in children's literacy development, and the relation of children's writing to other literacy skills.

GENETIC ANALYSIS OF THE RESPONSE TO AIRWAY IRRITATION IN A RODENT MODEL

Anthony Guzzardo

Mentor(s): Jack Harkema (Pathobiology and Diagnostic Investigation)

The prevalence of respiratory diseases such as asthma has greatly increased over the last few decades and a better understanding of the pulmonary response to irritation can lead to more effective treatments. Using a rodent model the response to airway irritants, specifically aerosolized diesel exhaust particles (DEP), was quantified using real time PCR. Through intranasal introduction mice were sensitized to either chicken ovalbumin (OVA), OVA and ultra fine DEP, or saline as a control. Mice were later either exposed to filtered air (FA) or challenged with DEP. After 25 days the mice were sacrificed and lung tissue was collected, homogenized, and RNA was collected using the Qiagen RNeasy filtration system to obtain pure RNA. From this RNA, cDNA was produced and used with 32 different primers for genes suspected to be involved in respiratory reactions to irritants to perform real time PCR to quantify the expression of these genes. This data is then used to determine which genes are involved in the asthmatic response to the irritation.

GEOGRAPHIC RACIAL EQUALITY: A LOOK AT HISPANICS AND WHITES IN PUEBLO COUNTY, COLORADO

Wonder Haas

Mentor(s): Joe Darden (Geography)

This paper asks whether and to what extent there exists geographic racial equality for Hispanics in Pueblo County, Colorado in respect to income, education and occupation. Using data from the 2000 US Census the results revealed that a very small "Census Designated Place" located in Pueblo County, Colorado that does in fact qualify as a place of geographic racial equality for Hispanics.

SELECTING AN OPTIMAL LOCATION FOR AN EXPANDING FOOD FRANCHISE

Laura Hammer, Natalie Flessland, Julie Hirshey

Mentor(s): Patricia Huddleston (Advertising, Public Relations and Retailing)

Site selection is a critical success factor for any business, regardless of size. Making informed decisions about appropriate sites requires the assessment of many factors: target market demographics and lifestyle, environmental and economic conditions of the proposed site and trading area characteristics. These factors must be carefully matched to the strengths of the business. The purpose of this project was to research, identify and propose an optimal site for a new Port of Subs franchise location. Port of Subs, headquartered in Las Vegas, Nevada and recognized by Entrepreneur magazine as one of the top franchising opportunities in the U.S., features fresh-to order hot and wrap style sandwiches. To accomplish this, our team used the geo-demographic mapping application, Simply Map, to develop a strategic location for Port of Subs. Knowing that we wanted to place our location close to a college campus, and expand the business further east, we focused on Provo, Utah. Simply Map helped us pinpoint the specific trade area and analyze the demographics of the area to insure that the location met Port of Subs criteria for success. We conducted further research on Provo, Utah and pinpointed the Shops at Riverwood in a business and residential area with a critical mass of Port of Subs' target customers. Using information provided by databases such as Hoovers and Mintel Reports, we were able to predict the success of this location.

CEREBRAL PALSY SURVEILLANCE OF COMMUNICATION AND EATING

Carly Hanna

Mentor(s): Mary Jo Cooley Hidecker (Communicative Sciences and Disorders/Epidemiology)

Population-based data are provided by cerebral palsy (CP) surveillance registries. Prevalence of communication and eating difficulties in CP vary, possibly due to data collection timing and varying definitions. A 21-question survey was created to ascertain the type, frequency of collection, and operational definition of communication (consisting of speech, language, and hearing) and/or eating data used by each registry. Contacts received emailed invitations to participate. Through snowball recruiting, contact details for 41 registries were collected. Twenty-one registries responded: 14 in Europe, 6 in Australia, and 1 in Canada. Variation exists in which, if any, aspects of communication and eating performance are collected. Hearing data are most often collected by responding registries (95%), although 12 definitions were detailed. Eighty-one percent collect speech data using 9 definitions, and 67% collect eating and/or swallowing data using 11 definitions. Language data are collected the least (43%) using 6 definitions. Most registries collect the data once. Reasons for not collecting included inadequate definitions or measurements, not a part of their minimum data set, or information was not available. Registries are restricted by the lack of agreed, valid, reliable measures of communication and eating. Differing definitions and data collection methods make pooling and comparing data difficult. Registries minimize the role of hearing and treat it in the biological perspective as a sense rather than an integral aspect of communication. Estimates of prevalence and appropriate service delivery for communication and eating challenges in individuals with CP could be improved by standardizing definitions and data collection.

ANALYZING AND TEACHING GLBT YOUNG ADULT LITERATURE FROM A QUEER PERSPECTIVE IN THE SECONDARY CLASSROOM

Katherine Hedrick

Mentor(s): Reade Dornan (English)

The purpose of this research was to determine the best critical theory to utilize when teaching and analyzing GLBT young adult literature in the secondary classroom. Although these texts are often introduced as "multicultural literature," this classification tends to imply a certain approach to the literature that focuses on recognition and appreciation of homosexuality rather than a critical analysis of the literature itself. In order to find the best method for utilizing these texts in a way that both recognizes the homosexual experience and allows for a more analytical examination, two different literary perspectives were compared. Through a critical study of two pivotal GLBT young adult texts, *Annie on My Mind* by Nancy Garden and *Boy Meets Boy* by David Levithan, readings from the literary perspectives of GLBT Studies and Queer Theory were compared and evaluated for their analyses of identity, representation, and power in the texts. Based on the results of this examination, analyses through the critical lens of Queer Theory, and the texts that privilege this type of queer reading, allow students to explore ideas of homosexuality in a way that moves beyond the traditional ideas of multiculturalism examined in GLBT Studies and introduces them to ideas that question the very essence of the homosexual identity. This method has also proved to be advantageous because it further endorses the use of GLBT young adult literature in the secondary classroom by showing the texts can be utilized as critical pieces of literature rather than simple tokens of multiculturalism.

MULTILOCUS SEQUENCE TYPING OF DIVERGANT AND ANCETRAL ESCHERICHIA COLI

Anthony Heidt

Mentor(s): Thomas Whittam (Microbiology and Molecular Genetics)

Escherichia coli is a widely used model microbe. This species is also very diverse, with symbiotic intestinal strains, pathogenic clinical strains, and highly divergent environmental strains. In order to study the evolution and history of all these diverse strains of E. coli, Multi-locus Sequence Typing (MLST) has been used to classify these bacteria into Sequence Types or STs. MLST usually uses 7 housekeeping genes to assign strains into STs from which inferences

about the history of *E. coli* evolution can be made by creating phylogenetic trees. A procedure called MLST 25 was developed to provide stronger support for current phylogenetic evidence and create a higher quality picture of *E. coli* evolution. MLST 25 uses a set of 24 housekeeping genes and a 16S rRNA sequence to provide a much better resolution when analyzing *E. coli*. A set of 81 previously identified ancestral *E. coli* strains was classified by using this new method: MLST 25.

MIGRATORY RESTLESSNESS IN WILD-LIVING PASSERINES

Virginia Heinen

Mentor(s): Michele Johnson (Zoology)

Although migratory restlessness, a general increase in behavior exhibited by migratory animals prior to their time of migration, is often used to study migration patterns, it has only been well recorded in caged birds. Without studies of restlessness in wild birds, it is difficult to discern if restlessness is a naturally occurring behavior or the result of a captive environment. Using a focal animal comparison of wild nonmigratory goldfinches and chickadees, and wild migratory sparrows, I found that some behaviors typical of restlessness occur in a wild environment while others do not. Specifically, wild migratory sparrows exhibit increased rates of wing movements and overall activity, which are associated with restlessness. However, they do not exhibit the increased rates of hopping that are seen in premigratory caged birds. These results suggest that migratory restlessness is more complex than previously assumed, and stand as a starting point for further research into the premigratory behaviors of wild animals.

VARIATIONS ON AMERICA

Sigal Hemy, Borah Han, Laura Rasmussen

Mentor(s): Justin O'Dell (Music (Clarinet))

The tradition of American classical music is even briefer than our nation's history. While the daunting legacy of European classical music lasted long into the nineteenth century, American music has only just begun to come into its own. The twentieth century was a time for American composers to create a sound that was distinct, recognizable, and uniquely theirs. Through the performance medium of the violin-clarinet-piano trio, we will illustrate the progression of American music throughout its short history. In doing this, we hope to assert the importance of this chamber ensemble in shaping the American musical idiom. Our presentation will trace the development of American music in general, using the medium of our trio as a microcosm. Additionally, we will highlight the hand MSU has had in shaping the music of the latter part of the twentieth century, and demonstrate through performance how we as a trio carry on that tradition.

DIFFERENCES IN ADHESION BETWEEN ENTEROHEMORRHAGIC ESCHERICHIA COLI O157:H7 CLADES 8 AND 2

Scott Henderson

Mentor(s): Galeb Abu-Ali (Microbiology)

Enterohemorrhagic *Escherichia coli* (EHEC) O157:H7 is responsible for numerous outbreaks of food/waterborne disease. Clinical manifestations of O157:H7 infection range from diarrhea to hemorrhagic colitis and hemolytic uremic syndrome (HUS). Colonization of the intestinal mucosa via attaching and effacing (A/E) lesions, which are mediated by the LEE-encoded type three secretion system, and production of Shiga toxins are hallmarks of O157:H7 pathogenesis. The epidemiology of O157:H7 infection is characterized by variation in disease severity, i.e. rates of hospitalization and HUS differ among outbreaks. Assessment of the genomic diversity of > 500 clinical strains of O157:H7, by single nucleotide typing (SNP) of 96 loci, has correlated virulence factors and fashioned 9 distinct genetic lineages (clades 1-9). Clade 8 is 7 times more likely to be associated with HUS than all other clades combined. Since colonization of the intestine is the initial step for infection, we hypothesized that clade 8 has an increased ability to adhere. To test this hypothesis we quantified the adherence and invasion levels of clade 8 and clade 2 strains by infecting MAC-T bovine mammary epithelial cells. The average association level of clade 8 strains are 2.2 fold higher than clade 2 strains (p-value <.0001). Invasion assays revealed no significant difference between the two clades (p-value >.20). Our data indicates clade 8 has an increased ability to colonize epithelium which implies that it has an advantage in establishing presence in the gut compared to clade 2.

AN INVESTIGATION OF THE RELATIONSHIP OF SAMPLE SIZE AND MEAN LENGTH OF UTTERANCE FOR CHILDREN WITH DEVELOPMENTAL LANGUAGE IMPAIRMENT

Marcy Herwaldt, Laura Roche

Mentor(s): Michael Casby (Communicative Sciences & Disorders)

Mean length of utterance (MLU) is a historically important and contemporary measure of the expressive language development of children. It is a measure of the average utterance length produced during an expressive language sample collected from a child. The suggested conventional, contemporary practice is to calculate the MLU from a language sample consisting of a minimum of 50 to 100 contiguous utterances. This practice places a considerable strain on professionals working with young children with language disorders, for it is often impractical to devote the time needed to collect and analyze the recommended, required number of utterances. There is little research to support the standard sample size suggestion, and as noted, it may be very difficult for professionals to collect and calculate an MLU on a sample of even the smallest suggested size. The purpose of this research was to investigate the relationship between the size of a language sample and mean length of utterance. This research investigated the reliability, correlation of MLU calculated on language samples of different sizes. Transcripts of expressive language samples of research participants were analyzed, with MLU being calculated on samples of varying sizes. The samples ranged from ten to approximately 130 utterances. The reliability, correlation, and significant differences of MLU calculated on these samples of varying sizes were examined.

IDENTIFYING HISTORICAL STATES OF BALANCE (STEADY STATE/EQUILIBRIUM) IN LAKES USING SEDIMENT CHRONOLOGIES OF REDOX-SENSITIVE METALS

Mary Hingst

Mentor(s): David Long (Geological Sciences)

Sediment cores were collected from Michigan lakes to examine the influence of human activity (e.g., logging) as recorded by vertical concentration profiles (sediment/pore water) of redox sensitive metals. The working hypothesis was that without influence from human activity or rapid climate change, biogeochemical cycles in lakes would attain a balance (steady state/equilibrium) with the flow of chemicals from the watersheds. Once attained, redox conditions in the sediment would also enter steady-state and the vertical chemical patterns in the sediments should reflect this condition (observed in cores from L. Superior). Vertical profiles of the metals were compared to expected concentrations based on thermodynamic constraints. Absolute concentrations and indicator-inferred concentrations that take into account changes in rates of watershed inputs were explored. Concentrations that differ from inferred concentrations can be attributed to anthropogenic inputs, diagenesis, and changes in the type of material coming off of the landscape. Results showed that inferred concentration profiles differed from absolute concentrations profiles, patterns in the near-

surface sediments appeared to reflect thermodynamic predictions, pore-water profiles showed a significant flux of metals out of the sediment, and there was evidence of historical redox steady state conditions. Results were interpreted to indicate that logging may have decreased the Eh of the sediments causing the flux of metals out of the sediment, which is temporally halted by a seasonal redox layer; although, the sediment record is being altered by diagenetic fluxes, past stable redox states can be identified, but past states can not be identified by absolute concentrations alone.

OPTIMIZATION OF AN ELECTROSPUN NITROCELLULOSE CAPTURE PAD FOR BIOSENSING APPLICATIONS OF ESCHERICHIA COLI O157:H7

David Hochhalter, Michael Wiederoder

Mentor(s): Evangelyn Alocilja (Biosystems Engineering)

The Center for Disease Control estimates that 76 million cases of food borne illness occur each year in the United States with. In order to prevent outbreaks, the contamination needs to be detected before a food product reaches the market in a rapid, accurate test such as a biosensor. The goal of this research is to develop an accurate, rapid, and easy to use biosensor for Escherichia coli O157:H7 to prevent food borne illness. The conductive, immunosensor constructed for this project consists of electrospun nitrocellulose nanofibers to improve on a previous biosensor design using commercial nitrocellulose by providing a greater surface area to increase the sensitivity. For the procedure the first step was to graft selective antibodies onto the nanofibers using a chemical procedure. To verify antibody attachment fluorescently tagged antibodies were bound to the nanofibers and the sample was imaged under a confocal laser scanning microscope. Images confirmed the preferential attachment of the antibodies to the nanofibers and a higher fluorescent intensity of treated samples over a control nitrocellulose fiber pad. Scanning electron microscope images also confirmed the binding of bacteria to the nitrocellulose nanofibers. Initial steps to conduct the conductive immunosensor including electrode development and platform construction are in progress. Preliminary tests have proven inconclusive, but further tests should yield a positive test for the target bacterium. This new sensor should be a rapid, inexpensive, and sensitive method to detect different types of bacteria.

TOTAL ANTIOXIDANT CONTENT IN WHOLE CHESTNUT MEAT AS AFFECTED BY PACKAGING OVER TIME

Korey Hodges

Mentor(s): Kirk Dolan (Food Science and Human Nutrition)

Consumers in today's society look for more in a food product than simply something to fill their stomachs. When buying a product they want to know that the food they purchase can not only sustain but improve health. It is for this reason that high antioxidant value is such a marketable factor in selling any product. Chestnuts have among the highest antioxidant values in whole nut produce. My research measures the ORAC (Oxygen Radical Absorbance Capacity) values of the meat from whole chestnuts packaged in DuPont films and will show the affects of these packages in protecting the antioxidant capacity of this food over time.

A CRITICAL VIEW OF THE CENTERS FOR DISEASE CONTROL AND PREVENTION'S IMMUNIZATION SCHEDULE

Meghan Hodges, Christopher Purdy, April Townsend

Mentor(s): Mark Largent (Science Policy)

Our research is a critical examination of the Centers for Disease Control and Prevention's vaccination schedule and is focused on the support and opposition the organization has received, which continues to guide public opinion. We analyze literature published by medical authorities, scientific researchers, average consumers, and the CDC itself in order to gain a diversified perspective. Our research discusses the appropriate ages, as well as safe timelines, for patients to receive vaccinations as determined by the CDC. Investigations of this topic have brought about several concerns regarding the hazards of vaccination at young ages, along with potential health risks of simultaneous vaccinations. Our main goal is to reach an educated decision as to whether the CDC has produced a safe vaccination schedule for infants, children and adults. This research culminates various opinions about the CDC's schedule, and the influential prospects which help to create the vaccination schedule. Our findings suggest that the CDC is intensely focused on achieving long-term national health goals, such as the eradication of targeted diseases and the maintenance of herd immunity, as opposed to instantaneous health risks associated with the administration and composition of vaccines. We have concluded that in order to ensure the public is receiving the highest level of vaccine safety, it is crucial for an increase of public awareness concerning the development and adjustments of the CDC's vaccine schedule and policy.

PHANTOM ENERGY WASTE IN UNIVERSITY HOUSING

Jessica Holberg, Steve Arnold, Emily Campbell, Megan Gebhart

Mentor(s): Terry Link (Finance & Operations Vp & Treasurer), Steve Safferman (Biosystems & Agricultural Engineering)

This project is being undertaken to gauge the amount of phantom energy lost in dorm rooms across campus. This information will be used to determine to total cost of producing this wasted energy and to pinpoint cost-effective ways to reduce the amount of phantom energy in dorms. In order to gather the necessary data, paper surveys will be distributed regarding student's electricity use, and predetermined rooms will be entered to take measurements of the phantom energy being wasted. These measurements will be taken with Kill-a-watt meters. The surveys will be analyzed to determine the electricity use of the average resident on campus. The measurements taken with the Kill-a-watt meters will be used to determine the average amount of wasted energy in a single dorm room. The data from the survey and the measurements will be used to determine the amount of money the University spends each year producing wasted energy. This number will then be used as a guideline for determining cost-effective ways to reduce the amount of phantom energy lost across campus.

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

William Holdsworth

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 quality 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 green 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 220 F2 individuals, the map position of ug has been refined to an interval of approximately three cM. Current efforts are focused on increasing the mapping population in order to obtain higher resolution of the gene locus. Once the gene is mapped and isolated, the mechanism behind gene function will be analyzed.

IN SEARCH OF THE ARTHROPHYCUS MAKER

Megan Holycross

Mentor(s): Danita Brandt (Geological Sciences)

Trace fossils are the preserved tracks, trails, and burrows of ancient organisms. A trace fossil from the Carboniferous Period (354 to 290 million years ago) from Eaton Rapids, Michigan shows gently curved, annulated burrows between one and two mm in diameter. They resemble traces previously described as the marine ichnogenus *Arthropycus*. They are unique, compared to other species in this ichnogenus, in the parallel arrangement of the burrows. *Arthropycus* is traditionally thought to be the tracks of either worms or arthropods. The goal of our research is to determine what species, extinct or extant, made the Eaton Rapids trace fossils. The trace maker would have lived in a marine environment, near to land. The most likely candidates to have made our tracks were: arthropods (millipedes, centipedes, or isopod crustaceans), annelids (polychaetes), and lobopods (onychophorans). Uchman and Peresler (2006) illustrated isopod trackways that closely resembled the Eaton Rapids traces. On this basis we concluded that isopods had more in common with our mysterious trace-maker than the other groups of animals we considered. As with most things in paleontology, this conclusion is tentative, pending the unlikely discovery of a body fossil preserved in the trackway. In light of this uncertainty, we have decided that an interpretative dance would be an effective method to convey our ongoing quest for the *Arthropycus* maker. The precedent for this performance is the "Dance Your PhD" program instituted by the American Association for the Advancement of Science.

USING MULTICULTURAL LITERATURE IN THE SECONDARY SCHOOL CLASSROOM

Heather Homant

Mentor(s): Kathy Jurado (English)

This is a study of how the multicultural young adult literature can be successfully used in the secondary school English language arts classroom, and how using this material fits into a multicultural education.

FEMALE ATTRIBUTES CORRELATED WITH THE INCIDENCE OF MULTIPLE PATERNITY IN THE SNAPPING TURTLE (*CHELYDRA SERPENTINA*)

Charlene Hopkins

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

The snapping turtle, *Chelydra serpentina*, is negatively affected by human pressures, such as harvesting, and habitat degradation, fragmentation, and loss. To continue having sustainable populations of this species it is important to study the reproductive success and incidence of multiple paternity in snapping turtles. *C. serpentina* is a long-lived, iteroparous, polyandrous species, in which females preserve sperm from previous mating events and breeding seasons. All of these conditions, as well as previous research, lead to possible multiple paternity, all offspring in a single clutch do not share the same father. Larger females have larger clutches and older females have more stored sperm and lay clutches more frequently, therefore larger and/or older female snapping turtles have a greater probability of multiple paternity within a given clutch. This study was completed using snapping turtle data from the Edwin S. George Reserve within the context of a long-term study. Three polymorphic microsatellite loci were examined, when one clutch had three or more paternal alleles the clutch was considered to be sired by a minimum of two males, thus exhibiting multiple paternity. This research establishes the frequency of multiple paternity in *C. serpentina* and determines what attributes of females correlate with multiple paternity. Understanding the possibility of multiple paternity and how it affects the reproductive success of snapping turtles will help in managing their populations for future sustainability.

GLOBALIZATION AND THE MEXICAN PRESS

Kelly House, Kyle Feldscher, Justin Harris, Marilyn King, Cash Kruth

Mentor(s): Folu Ogundimu (Journalism)

We wish to examine globalization and the press in Mexico and America. For this project, we will examine comparative media, methods of distribution, availability and press freedoms in Mexico and America. Specifically, we will examine how Mexico's press freedoms have changed with the emergence of globalization and the increasing influence of democratic mindsets and ease-of-distribution of information.

DNA BINDING AND DISSOCIATION CONSTANT OF ALKYLATION RESPONSE PROTEIN AIDB IN *ESCHERICHIA COLI*

Michael Howard

Mentor(s): Robert Hausinger (Microbiology and Molecular Genetics/Biochemistry and Molecular Biology), Scott Mulrooney (Microbiology and Molecular Genetics)

Exposure of *Escherichia coli* to chemical 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 a crystalline structure similar to the flavin-containing acyl-CoA dehydrogenases. Though the molecular mechanism by which AidB reduces the effects of alkylating damage is unknown, two theories exist. The presence of a redox-active flavin prosthetic group implicates its use in the direct repair of alkylated DNA. Alternatively, the crystalline structure implicates a role of AidB in protecting DNA by binding and destroying alkylating agents that have yet to contact their DNA target. In this study, the protein was purified to homogeneity and its DNA binding properties were examined. By using electrophoretic mobility shift assays (EMSA) AidB was shown to have an approximate K_d of 30nM.

DEVELOPMENT AND EFFICACY OF ANTI-SALMONELLA MAGNETIC BEADS

Michael Huarng

Mentor(s): Evangelyn Alocilja (Biosystems Engineering), Deng Zhang (Biosystems Engineering)

Biosensors provide a rapid and sensitive means in detecting pathogens for food safety and anti-bioterrorism. This research is focused on the development of polyaniline-coated magnetic beads (PCMB) for immunosensor application. Salmonella antibodies were conjugated to PCMB via physical absorption. The binding efficiency of anti-Salmonella antibody-coated PCMB was evaluated by counting the bound pathogens after immune reaction and magnetic separation. In addition, the optimum ratio between antibody-coated PCMB and pathogens was tested. The results show that the binding efficiency of these PCMB is high. The high efficacy, simple synthesis and low cost make PCMB a better alternative to commercial antibody-coated magnetic beads. These PCMB can be widely used in food safety, anti-bioterrorism and healthcare assays.

DEVELOPMENT OF ANTIMICROBIAL FILMS BASED ON PLA WITH IMPLICATIONS FOR FOOD PACKAGING

Elizabeth Huber, Benjamin Winingar

Mentor(s): Eva Almenar (Packaging)

Antimicrobial active films play an integral role in food packaging as they help to enhance food safety and increase shelf life. Additionally, with current trends and consumer demand pushing for “green” and sustainable solutions, the arena of renewable and bio-based polymers cannot be ignored. This study focuses on the development of an antimicrobial active cast film based on the melt extrusion of polylactic acid (PLA, a bio-based polymer) and the food preservative propionic acid calcium salt. Both PLA and propionic acid calcium salt, are approved by the FDA for direct food contact. By defining barrier properties (specifically water, oxygen, and carbon dioxide), physical properties, mechanical properties, and antimicrobial in vitro tests, this study shows that current standards for anti-microbial barriers and food safety can be maintained using a bio-based polymer as opposed to the oil-based polymers used in industry today.

ROLE OF HEAT SHOCK PROTEIN 70 (HSP70) IN O₃-INDUCED LUNG INFLAMMATION

Kristin Hummel

Mentor(s): Alison Bauer (Pathobiology & Diagnostic Investigation)

Ozone (O₃) 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 O₃-induced lung inflammation, likely through the toll-like-receptor 4 pathway. To test this hypothesis, we used Hsp70 deficient mice on a C57BL/6 background and their wildtype (C57BL/6; B6) controls exposed to 6, 24, 48, and 72 hr of continuous 0.3 ppm O₃ 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 deficient mice. To further understand the downstream signalling involved in this differential strain response, we found that c-jun, an AP-1 transcription factor, is increased in response to O₃ in the B6 mice; c-jun is significantly reduced in the Hsp70 deficient mice compared to the B6 controls. We also found strain differences in MAP kinases (ERK1/2 and JNK) using immunoblotting techniques. Future studies will examine the downstream mechanisms involved in mediating the differences observed with Hsp70 deficient mice, such as antigen presentation.

PERFORMANCE GENEALOGY: ARTS THROUGH THE AGES

Jeremy Hunt, Lauren Glinke, Daniel Kring, Jessie Neilson, Jordan Starks

Mentor(s): Kirk Domer (Theatre)

Through scientific and genealogical analysis, a chosen theme or story will be traced in history linking music, drama, poetry, dance, and literature in the art of performance.

TESTING THE PREDICTIVE ABILITY OF THE THEORY OF REASONED ACTION AND KNOWLEDGE ON INTENT TO COMMUNICATE ABOUT AND DONATE BLOOD

Allison Hurley, Benjamin Hall, Tom Jackson

Mentor(s): Kami Silk (Communication)

Blood products are necessary to save lives and treat patients. However, health care facilities across the state of Michigan are facing dangerously low supplies of the precious commodity, with blood supplies dwindling from a 3-day to a 24-hour supply. This threat to public health requires social scientific research that examines antecedents to blood donation behavior to identify strategies that can impact blood donation behavior. Thus, the current study tests the theory of reasoned action (TRA) in conjunction with knowledge to better understand intentions to communicate about and engage in blood donation behavior. The TRA utilizes the constructs of attitude and subjective norm to predict intention and subsequent behavior. Subjective norm refers to beliefs about whether significant others approve of a behavior and whether that approval is valued, while attitude refers to the sum of beliefs about a particular behavior weighted by evaluations of these beliefs. Participants (N=297) in this study completed an online questionnaire with items that asked them about their attitude, subjective norm, knowledge, and behavioral intentions to communicate about and engage in blood donation behavior. Results found support for the TRA such that attitude and subjective norm were significant predictors of intentions related to blood donation; however, knowledge did not add unique variance to the model. Implications of these results are discussed as they apply to future communication campaigns that aim to increase blood supplies in Michigan as well as across the United States.

AFRICA'S LATE DECOLONIZING TRANSITIONS: SOUTH AFRICA'S ANC AND NAMIBIA'S SWAPO

Nicole Iaquinto

Mentor(s): Rita Edozie (International Relations)

Both the African National Congress (ANC) and the South West Africa People's Organization (SWAPO) started out as revolutionary movements in South Africa and Namibia, respectively, and aided in the decolonization process of both. After decolonization occurred in the early 1990s, the ANC and SWAPO moved from being social movements to political parties. Both are still in power to this day, but have radically changed the course of their political ideals. I will focus on three key questions: (1) What are the historic origins of both the ANC and SWAPO?; (2) What roles did both the ANC and SWAPO play in the decolonization of South Africa and Namibia?; (3) How did the evolution from social/revolutionary movements to incumbent political parties affect the political ideas of the ANC and SWAPO? Namibia and South Africa were among two of the last African countries to win independence from their former colonial masters in the 1990s, but not without significant struggle. The ANC and SWAPO played a pivotal role in the decolonization of both countries through militant resistance. When independence was won, leaders from both movements were elected into positions of power, becoming the dominant political parties. Both are still in power, yet their principals and ideals have changed. They are much more conservative due to a number of factors. Both have had their fair share of problems due to power hungry politicians, mismanagement of government, and most importantly, the sacrifices they have had to make as political parties to keep afloat in the rapidly globalizing world order.

ANXIETY AND ACHIEVEMENT: INVESTIGATING THE IMPACT OF TEST ANXIETY ON COLLEGE-LEVEL STUDENTS

Valerie Inwald

Mentor(s): Paul Cooke (Communicative Sciences and Disorders)

Many college students are reported to experience symptoms of the fight-or-flight response during academic testing conditions. Some students report such responses facilitate academic success, while others believe these symptoms hinder their outcomes. The purpose of this study was to explore the relationship between reported bodily responses and perceived achievement during academic testing activities. A sixteen-item closed-question survey was administered to students from Michigan State University's Communicative Sciences and Disorders undergraduate program. Questions regarded the prevalence and perceived effect of symptoms associated with testing situations. In addition, subjects identified specific manifestations associated with

their physical, cognitive, and emotional reactions to academic testing situations. The data from the returned questionnaires were analyzed using standard statistical procedures and were examined in relation to the students' grade point average and preparation time.

CHARACTERIZATION OF SWARMING MOTILITY IN SOIL BACTERIA

Katherine Ivens

Mentor(s): Terence Marsh (Microbiology)

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. Herein, we report studies on movement and swarming behavior of three Gram positive bacterial isolates (SW07, SP07 and SP08). To identify these strains, the 16S rRNA gene sequences were PCR amplified and sequenced. Phylogenetic identity of the isolates was determined through the Ribosomal Database Project. Strain SW07 was distantly related to an undescribed *Paenibacillus* spp. (91% homology), while the other isolates were closely related to *Bacillus pumilus* (SP08) and *Lysinibacillus sphaericus* (SP07) at 97% and 96% similarities, respectively. Four media were tested to optimize nutrient conditions for swarming and Mueller-Hinton with 1.5% agar was selected for subsequent studies. Under aerobic conditions, SW07 was the most motile (62.9 $\mu\text{m}/\text{min}$) and displayed complex behavioral patterns ranging from multicellular extensions departing the colony to internal rotating vortices. SP07 and SP08 also displayed spreading patterns, but movement was substantially slower. In anaerobic environments, the morphology of SW07 observed in aerobic environments was not seen. Vortices and swarming motility were restored and the motility of the three strains increased substantially when media was supplemented with nitrate, suggesting these strains can respire under anaerobic conditions and that their motility is dependent on respiratory metabolism. The response of isolates in the presence of various electron acceptors is being investigated to gain a better understanding of bacterial motility in soil.

AN EXPLORATORY STUDY OF THE RELATIONSHIP BETWEEN STUDENTS FACEBOOK USE AND OFFLINE POLITICAL ACTIVITY

Reena Jain

Mentor(s): Charles Steinfield (Telecommunication, Information Studies, and Media)

The goal of this research is to investigate the extent to which students engage in forms of political activity in their use of an online social network site, as well as to explore how such usage may be related to students' offline political activity. In this two-part study, we first content analyzed a random sample of 200 publicly accessible profiles on the MSU Facebook network. Political activity was coded by recording any mention of recognized political figures and issues from the November 4, 2008 election in each of the following profile fields: groups; applications; wall posts, status, and events, using a sample of the five-day period surrounding the election day. In the second phase of the study, we surveyed participants whose Facebook profiles had been analyzed. Questions on the survey were used to determine participants' perceptions of their own online and offline political activity as well as their opinions about the role of politics in Facebook. We hypothesize that online and offline political activity are positively correlated. Additionally, we expect that students exhibiting greater online political activity were also more likely to have voted in the November 2008 election.

COMPUTATIONAL CIS-REGULATORY GRAMMAR AND EXTENSION OF MODEL TO ENDOGENOUS ELEMENTS

Tess Jeffers

Mentor(s): David Arnosti (Biochemistry and Molecular Biology)

Transcriptional switches are turned on and off to regulate development of eukaryotic organisms. Cis-regulatory information has become increasingly important in understanding how particular genes are affected during development by varying types and levels of transcription factors. Expression is dependent upon the stoichiometry, spacing, organization, and affinity of activator binding sites - known collectively as cis-regulatory "grammar". Our lab has developed a mathematical model to predict the repression of novel synthetic constructs transformed into germline *Drosophila melanogaster* based on the confocal laser scanning microscopy fluorescence of these embryos. While already established, it is possible to work new optimization of parameters and better normalization procedures into the model for a better fit. When imaging the blastoderm embryos, not all are uniform in rotation on the microscope slide. This added variation in lac-Z signal implicates an imprecise measurement of Giant protein. Clustering the embryos by the fraction of the anterior stripe to total embryo, it was possible to see a semi-normal distribution of rotations. This distribution will be used for writing MatLab codes to correct for the lac-Z signals and creating a more uniform dataset. So far, this model has proven effective on synthetic enhancers. A truly powerful model, however, must be extended to endogenous targets. Future work will involve a bioinformatics approach to finding binding sites for the cis-regulatory element controlling gene short gastrulation (*sog*). Updating the model with the information gathered in this approach will increase its robustness in its ability to predict repression in endogenous elements rather than synthetic.

TIMESCALE ESTIMATES OF AQUEOUS ALTERATION ON CARBONACEOUS CHONDRITES BY THE SHRINKING CORE MODEL

Kathleen Jeffery

Mentor(s): Michael Velbel (Geological Sciences)

C2 carbonaceous chondrites are primitive meteorites which contain evidence of early solar system conditions. In particular, these meteorites provide data about water in the early solar system through mineral grains which have been partially altered by hydration reactions. By studying specific grains, which contain both the initial anhydrous olivine reactant and its aqueously altered product serpentine, it is possible to estimate the amount of time it took the mineral to partially react. Meteorite QUE93005 from Antarctica used in this study, one of the most extensively altered chondrites known, provides limiting estimates of alteration timescales. Images of partially-altered grains were acquired with a scanning electron microscope and used to measure the thicknesses of replaced mineral zones. Because the rate-limiting process appears to be the diffusion of water/solutes through the replacement product (serpentine), representative diffusion coefficients were selected for extremely low layer charge 1:1 phyllosilicate minerals related to serpentine. The measured thicknesses and representative diffusion coefficients were used in a shrinking core model to quantitatively estimate the shortest and longest possible duration of hydration reactions in several partially-altered grains of QUE93005. Calculated grain-scale mineral replacement timescales (based on chemical processes) for small individual volumes studied here are short compared to timescales of the total duration of aqueous alteration on chondritic parent bodies as inferred from geochronologic measurements and modeling, as expected because of the parent body's vast sizes and additional time needed for water to diffuse throughout the parent body and alter it.

DIRECT-TO-CONSUMER ADVERTISING OF GARDASIL

Kayla Jelinek, Landon Ginsberg, Emily Kramer

Mentor(s): Mark Largent (History)

It is estimated that in 2008, 11,070 women were diagnosed with cervical cancer and 3,870 women died due to cervical cancer in the United States, making this cancer the second leading cause of cancer related deaths. With statistics reaching into the thousands, the pharmaceutical company Merck made an imperative first step towards the eradication and prevention of cervical cancer with the development of the vaccine Gardasil. However, the

reality is Gardasil only protects against two cervical cancer causing strains of the Human Papillomavirus (HPV) accounting for 70% of cervical cancer cases. With this controversial information the question arises, how has Merck Co. used direct-to-consumer advertising of Gardasil to their advantage and what does the shift in the campaign signify? Direct-to-consumer advertising (DTCA) is defined as the marketing of pharmaceutical products by drug companies directly to consumers via the use of mass media. DTCA was not legalized in the United States until 1997, and is presently only legal in one other country, New Zealand. There is still disagreement among critics as to the beneficial and detrimental effects of this style of advertising. Merck employs an emotional fallacy tied fear to promote Gardasil to a laymen female audience resulting in early administration and overuse of the vaccine. Nevertheless, Merck argues it is educating the consumers while encouraging prevention. With our research we intend to shed light on the integrity and motives of Merck in the Gardasil campaign, in addition to Gardasil's magnitude of cervical cancer prevention.

THE EFFECTS OF MESSAGE FRAMING ON THE CESSATION OF A POTENTIALLY DAMAGING HEALTH BEHAVIOR: ALCOHOL CONSUMPTION IN COLLEGE STUDENTS

Sara Jelinek

Mentor(s): Joseph Cesario (Psychology), Kevin Ford (Psychology)

This study consists of an experiment designed to test the persuasiveness of message framing on the cessation of potentially health damaging behaviors, specifically alcohol consumption in college students. It will test the hypothesis that those participants who experience regulatory fit while reading a persuasive message will drink less (relative to a baseline measurement) than participants who do not experience regulatory fit. Regulatory fit occurs when people engage in an activity or make decisions in a way that sustains their orientation, which leads them to "feel right." For individuals with promotion focus, this occurs when a framed message emphasizes the good outcomes of adhering to a recommended behavior. For individuals with prevention focus, this occurs when a framed message emphasizes the bad outcomes of not adhering to a recommended behavior. This experiment will assess the participant's regulatory focus (promotion or prevention), drinking habits (QFI), and reactions to a persuasive message (framed in benefits or costs) about alcohol consumption. Expected findings include that promotion (prevention) focused individuals will be more persuaded to perform cessation behaviors when messages are framed in terms of adherence/benefits (non-adherence/costs). Whether the benefit/cost framing is distinct from framing of adherence/non-adherence is also tested. The answers to these questions are important for the understanding of how to promote cessation behaviors.

LIVING MANY LIVES: REPRESENTING THE EXPERIENCES OF BLACK WOMEN LIVING WITH SEVERE AND PERSISTENT MENTAL ILLNESS

Jessica Jensen, Brittany Konarz

Mentor(s): Marya Sosulski (Social Work)

It is estimated that two out of every five Black women are survivors of childhood sexual abuse (Kalof, 2000). Studies demonstrate that victimization from childhood sexual abuse may result in the development of a number of different psychological problems (e.g., dissociation, multiple personality disorder, somatization, bipolar, PTSD) (Briere & Elliot 1994). What is unknown, however, is whether the psychological disorders stemmed from the sexual abuse, or if the disorders previously existed and were triggered by the abuse. Using this knowledge, future development of research, policies, and services may direct treatment options to improve the woman's life experiences and recovery. This research seeks to understand the development of psychological disorders and its relationship to women's histories of childhood sexual abuse. In addition, the impact these disorders have on daily life will also be examined. Data are drawn from "Living many lives: Representing the Experiences of Black Women Living with Severe and Persistent Mental Illness," a phenomenological study using critical narrative analysis techniques to study qualitative data reflecting participants' individual life experiences. This research combines life history methods with narrative analysis to further demonstrate the need for more culturally sensitive research on the subject of Black women's daily experiences with mental illnesses (Sosulski, Buchanan, & Donnell, 2008). Techniques of narrative analysis were used to analyze six complete life history interviews. Findings demonstrate the complexity and ambiguity of the relationship. The analysis uncovers the importance of each woman's interpretation of her own experiences with childhood sexual violence and its impact on mental health.

HOW DO ENGLISH SPEAKERS LEARNING FRENCH MAKE TU-VOUS DECISIONS?

Laura Jensen

Mentor(s): Suzanne Wagner (Linguistics & German, Slavic, Asian & African Languages)

Research into the acquisition of tu and vous (henceforth T/V) has been broad. This study focuses on T/V acquisition in speakers lacking a similar concept in their native language by examining the T/V decisions of English-speaking Americans studying French. Discussions with advanced French students revealed 4 important factors in the T/V decision process. These were: Age of interlocutor, Status of interlocutor, Familiarity with interlocutor, and Formality of situation. These factors were used as the basis for an online survey which isolated each factor and tested the actual weight of its contribution to the T/V decision by having participants make T/V decisions. Additionally, the participants' perceived importance of the factors was tested by asking them to identify and rank influencing factors. 32 valid survey responses were collected from American learners of French. The overall results revealed the actual order of the factors from strongest to weakest: Status>Familiarity>Formality>Age. However, the results of the participants' perceived importance ranked Age more highly, suggesting that what participants believe they are doing diverges from their true actions. Broken down by amount of study and amount of immersion, the actual strength of the factors shows a shift in the ordering after 5 years of study and at 2 months of immersion. These two points seemingly mark the stabilization of a T/V heuristic. This gap between classroom and immersion learning suggests that either American lower level French courses do not include enough cultural education or that a T/V heuristic only stabilizes through sufficient interaction with proficient speakers.

THE EFFECT OF MEDICAL TRUST IN THE KINKEEPERSM PROGRAM: COMMUNITY HEALTH WORKER PERSPECTIVE

Andrew Jessmore, Julia Bawden, Kyle McDonald, Kim Nguyen, Manisha Singh

Mentor(s): Karen Patricia Williams (Obstetrics, Gynecology, and Reproductive Biology)

The presence of racial discrimination in the health care system and in medical research is the underlying cause of medical mistrust that is prevalent amongst minorities (LaVeist et. al 2003). Incidents like the US Public Health Study commonly called the Tuskegee Study, have contributed to the mistrust that many minorities display. The Kin KeeperSM Cancer Prevention Intervention integrates the idea that family networks and relationships have a significant impact on the amount of trust that families portray. Thus, the Kin KeeperSM model utilizes such family networks and relationships to relay cancer prevention techniques and other necessary medical information. In the Kin KeeperSM Cancer Prevention Intervention, a female member of the family is appointed as the "leader" (kin keeper) and invites other female family to the home-based cancer information session. Along with the kin keeper, the community health worker also plays a significant role in providing necessary health care education and means of prevention to the kin keeper and, in turn, the family. The community health workers' effectiveness at building trust amongst the family is the basis of this study. In this study, qualitative methodology was used to conduct a focus group session with Latina American, African American, and Arab American community health care workers to:

1) Obtain their opinions and thoughts on how trust impacts the Kin KeeperSM Cancer Prevention Intervention and; 2) To determine if there is a relationship between the trust that exists within the family and between the community health care worker.

A STUDY OF ELECTRICAL RESISTIVITY METHODS IN MONITORING MOISTURE FLUXES IN THE VADOSE SOIL ZONE

Benjamin Johnson

Mentor(s): Remke VanDam (Geological Science)

The nature of dynamic interactions between vegetation and soil moisture remain largely unanswered because it is difficult to monitor and quantify subsurface hydrologic fluxes at relevant scales. Improved methods for monitoring such changes accurately would benefit studies of the impacts of land use and climate change on the hydrologic cycle. Recent studies suggest that electrical resistivity can be used to characterize these processes at different scales. The objective of this study is to test the sensitivities of different inversion approaches to quantify changes in the unsaturated zone related to rainwater infiltration and seasonal drying. My approach is to construct models of the electrical properties of the subsurface by forward modeling unsaturated-zone moisture data below various types of vegetation and for different climatic inputs. The synthetic data are then run through an inversion process, which attempts to minimize the difference between the forward modeled data and the calculated results by iteration. I will test the sensitivity of the inversion procedure to the number of layers and their thickness in the model. This is the first such study for day-to-day and seasonal moisture variations.

CONSEQUENCES OF UNIVERSAL VACCINATION FOR VARICELLA

Emily Johnson, Rebecca Buchholtz

Mentor(s): Mark Largent (James Madison)

The varicella vaccine was developed for use in immunocompromised and other individuals at risk for severe problems if they were to contract varicella. In 1995 the Centers for Disease Control recommended that the vaccine be added to the immunization schedule in the United States. Varicella is a mild disease when contracted in children, and they often have lifelong immunity from the exposure to the disease. Long-term immunity from vaccines is lower, and is troublesome. Adults that contract varicella usually have much more severe cases of varicella and the risk for serious side effects is much greater. An often more serious disease associated with varicella is shingles. Shingles is a disease that often occurs in the older segment of the population, causing a lot of pain and the risk of flare up at any time. It is theorized that exposure to the wild-type varicella virus circulating in the population helps to keep shingles outbreaks suppressed. Our research sought to answer the question: why was the varicella vaccine introduced as a universally recommended vaccine for children when it is often a mild childhood disease, and the universal recommendation could cause the cases to shift toward an older population and increase shingles outbreaks?

BREAKING THE CHAINS OF GENERATIONAL CURSES: A HISTORICAL ANALYSIS OF THE BLACK FAMILY

Patrice Johnson

Mentor(s): Pero Dagbovie (History)

The truth is that the black family is foundational, distinctively a pillar, and rock of the black community. Many scholars have misinterpreted the black family as being weak and dysfunctional. This perspective is false. The black family during the period of slavery was adaptive to its conditions and survived the destructive mechanisms of that era. The black family has proven to be resilient. The effects of structural racism within American public policy have neutralized of the black family. The state of the black community is in direct relation to the condition of the black family. This study is sub-divided into three major sections. One explores the leading scholarly theories and historiography pertaining to the black family. Two briefly surveys the historical evolution of the black family. Three identifies some of the most pressing problems and challenges facing the black family in the 21st century. Four offers some potential solutions to remedying some of the monumental problems facing the black community. This study seeks to critically analyze the contemporary state, and various challenges facing, the black family today within an historical perspective. A host of questions will guide this study, including: How do we explain many of the present dilemmas that the black family faces? What has contributed to the overwhelming amount of absent fathers within the black community? How has slavery perhaps impacted the present state of the black family? What tactics have single mothers used to maintain sufficient living?

REDEFINING BIOAVAILABILITY

Teresa Johnson, Carla Christian, Cassandra Jenkins, Andrea Thompson

Mentor(s): Norman Hord (Food Science and Human Nutrition)

The health benefits of plant foods have been attributed to their vitamin, mineral and phytochemical content. Phytochemicals refer to plant-based chemicals that are secondary plant metabolites produced in response to numerous environmental stressors such as water scarcity, ionizing radiation, or insect attack. While categorically toxic, phytochemicals are ingested by humans at concentrations too low, in most instances, to produce pathological sequelae. However, chronic consumption of low concentrations of these compounds in humans can stimulate cellular stress responses that are protective, a hypothetical biological phenomenon known as hormesis. Hormesis is characterized by a compensatory defense response following exposure to a low dose toxin (stressor) that is disproportionate to the magnitude of the stressor. We investigated the bioavailability and metabolic disposition of five phytochemicals (i.e., curcumin, genistein, quercetin, epigallocatechin-3-gallate, and resveratrol), to ascertain whether the biological responses observed after exposure are attributable to a hormetic-type mechanism. The rank order of bioavailability for these phytochemicals, defined as percentage of ingested dose excreted in urine, is resveratrol (77%) > genistein (12%) > quercetin (0.38%) > EGCG and curcumin (trace). Plasma concentrations of metabolites of these compounds were markedly low and ranged from 0.008 μmol for EGCG to 0.56 μmol for resveratrol. Heretofore unrecognized biological activities of these metabolites demonstrate an essential role for biotransformation in enabling biological responses to dietary compounds. These data support a hypothesis that post-absorptive metabolism enhances retention of these compounds, making them available for formerly unrecognized biological activities to elicit hormetic responses.

SYNTHESIS AND PHYSICAL PROPERTIES OF DIVALENT METAL COORDINATION POLYMERS WITH FLEXIBLE LIGANDS

Lindsey Johnston

Mentor(s): Robert Laduca (Chemistry)

Hydrothermal treatment of aqueous mixtures of a series of metal salts and 1,3-phenylenediacetate (phda) with bis(4-methylpyridyl)piperazine (4-bpmp) has afforded the coordination polymers $[Cu(phda)(4-bpmp)_{0.5}] \cdot 0.5H_2O$ (1), $[Cu(phda)(H4-bpmp)](NO_3) \cdot 3H_2O$ (2), $[Cd(phda)(4-bpmp)](3)$, $[Co(phda)(4-bpmp)](4)$ and $[Ni(H_2O)_2(phda)(4-bpmp)] \cdot 2H_2O$ (5) which were analyzed via single crystal X-ray diffraction, infrared spectroscopy, and elemental and thermogravimetric analysis. In 1, Cu₂ paddlewheel units were connected to four others by phda ligands and bpmp ligands, thereby constructing a 3-D coordination polymer net. In compound 2, the nitrate ions force a 2-D coordination polymer net. $[Cd(phda)]_n$ double chains are pillared by tethering 4-

bpmp ligands to establish compound 3 into 2-D coordination polymer slab patterns. Compound 4 constructed a non-interpenetrated 3-D [Co(phda)(4-bpmp)]_n, coordination polymer network. Through a system of orthogonally disposed sets of chains, cross-linked by phda ligands, 3-D doubly interpenetrated coordination polymer framework is constructed in compound 5. When magnetic properties were explored, weak antiferromagnetic interactions were found in 2 and 4, and very strong antiferromagnetic interactions were present in 1. Compound 3 emitted blue-violet light when it was exposed to ultraviolet light.

EFFECT OF SUB-LETHAL HEATING ON SALMONELLA LETHALITY DURING SLOW-COOKING OF TURKEY AND BEEF PRODUCTS

Sara Jones

Mentor(s): Bradley Marks (Biosystems Engineering)

Slow cooking of ready-to-eat beef and turkey products can result in sub-lethal injury of Salmonella present in or on the product, and therefore increased thermal resistance at subsequent, lethal temperatures. However, current lethality models do not account for such an effect and therefore may over-predict lethality and lead to an unsafe product. Therefore, the objective of this study was to quantify the effectiveness of the traditional model (D, z) in predicting Salmonella lethality in ground and whole-muscle turkey and beef cooked in a moist-air convection oven, particularly for relatively slow cooking processes. Small, whole-muscle beef and turkey samples (~25 g), and ground samples of equivalent composition (~25 g), were sterilized via irradiation (>10 kGy) before inoculation (>10⁷ CFU/g) with an 8-serovar Salmonella cocktail. The samples were subjected to three different cooking schedules (ramped 32-60°C; 30-120 min) in a computer-controlled, moist-air convection oven; core temperature was monitored, and process lethality was computed real-time during cooking. Samples were removed from the oven when the computed Salmonella lethality reached the target (6.5 and 7.0 log reductions in beef and turkey, respectively, as predicted by log-linear inactivation kinetics determined via prior isothermal inactivation studies). The cooked samples were immediately cooled, serially diluted in peptone water, and plated on Petrifilm aerobic count plates (37 °C, 48 h) to enumerate survivors. Actual Salmonella inactivation was lower (P<0.001) than the computed values, with errors as high as 4.5 log. Over-prediction of lethality increased with the degree of sub-lethal heating (P<0.0001), was greater in beef than in turkey (P<0.05), and was greater in ground than in whole-muscle product (P<0.001). These results show that the traditional, log-linear model can significantly over-predict lethality in slow cooking processes. Therefore, lethality models and process validation procedures should account for this effect.

AN ANALYSIS OF IF AND HOW DEMOGRAPHICS ARE CORRELATED TO CONFIDENCE AND CORRECTNESS

Sarah Jordan

Mentor(s): Scott Clark (Geosciences), Julie Libarkin (Geosciences)

Literature on metacognition shows that a student's confidence in her/his perceived knowledge of a subject affects that student's decisions on what, when, and how much to study that subject. It is well documented that many individuals are over confident in their ability to perform familiar tasks. In my research, I am investigating how demographic factors such as gender, ethnicity, and economic status effect the relationship between task performance and confidence. I am using SPSS Software to critically analyze over 180 questionnaires given to non-science majors enrolled in a Physical Science course. Following instruction, these questionnaires asked students to answer a number questions on plate tectonic concepts, and to provide a measure of the confidence they felt in their answers. Included with the questionnaire was a survey that targeted subjects' prior experience in the geosciences and demographics. My preliminary findings suggest that overall, males are more confident than females in their responses, but male responses were no more correct than females. Where females indicated a high confidence in their answers, they did tend to provide a more complete / correct answer than males did for the same reported level of confidence. This work will enhance our understanding of the role played by demographic factors in the complex relationship between task performance and confidence.

DEVELOPMENT OF THEORY OF MIND AND DIVISION OF COGNITIVE LABOR

Meghan Kanya, Erica Jacob, Jessica Rice

Mentor(s): Judith Danovitch (Psychology)

Research conducted in the past has examined how children of all ages think and ask questions about the world around them. There have been numerous experiments examining children's knowledge about others and how this knowledge alters the way children view the people around them. Our study attempts to discover how preschoolers' (ages 3-5) ability to determine whom to ask different types of questions relates to their ability to know that individual people have different knowledge. Our participants are approximately fifty preschool children in the Lansing, Michigan area. Each child completes six tasks that focus on theory of mind, categorization, and the division of cognitive labor. Children complete the six tasks in two fifteen-minute sessions, spaced a week apart. Theory of mind involves children's understanding that other people may know different information than they know, and it typically develops between the ages of three and five. We measure theory of mind using tests involving ambiguous objects and unexpected contents. Understanding the division of cognitive labor is the ability to know that different people have different areas of expertise. We measure this ability by presenting the children with two experts in different areas and asking the children to choose who would know the answers to different types of questions. The results will allow us to determine if there are correlations among the different tasks and understand how a child develops knowledge about the world around them and the expertise of others.

RELATING BUFFER CHEMISTRY TO THE ANTIBACTERIAL PERFORMANCE OF ORGANIC ACIDS IN BRAIN-HEART INFUSION GROWTH MEDIUM

Binafza Kapadia

Mentor(s): Daniel Dougherty (Mathematics)

The buffering properties of different organic acids play an important part in determining the inhibition of pathogenic bacteria such as Escherichia coli and Staphylococcus aureus. Organic acids are increasingly being utilized as substitutes for antibiotics in animal feed and feed raw material. 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 .1% to 4% (by weight) of ascorbic, lactic, and acetic acids. Acid-base titrations were then carried out and replicated to characterize the batch-to-batch variability, measurement error, and other sources of variability. This data was entered into a database and statistically analyzed. The result of this analysis shed light on previous studies that concluded at 4% all of these organic acids produced strong bactericidal effects, at 1% only lactic and acetic acids did, while ascorbic had the weakest effect. We hope that our research will provide an understanding of these pathogenic bacteria not only in animal feed but also in the human body.

UNDERGRADUATE NURSING RESEARCH

Gloria Katsande

Mentor(s): Shannon Biergens (Nursing)

Peak bone mass for women are usually attained in their twenties. Early thirties, bone loss is at 0.5%- 2% per year. This makes it imperative to do early screening of osteoporosis by identifying the women who are at risk before they reach menopause using other tools before a BMD test. Purpose of the research is to develop a guideline that is used routinely to identify females aged 35-40 years who are at a higher risk for developing osteoporosis. In order to identify those at risk, I will design an 'expresso' osteoporosis risk assessment tool comprising of 10 questions. The questions will provide the patient with information of whether they are at risk or not. These questions are centered on the risk factors of osteoporosis. The other risk assessment tools that have been designed for example a guidelines published by American College of Obstetricians seem to be too long and contain terminology not easily understood by ordinary people. After completing the assessment tool, women who answer 'Yes' three or more times and are either underweight or overweight are then asked to do further testing which is Bone Mineral Density test. This test will confirm if they are osteopenic or not and should seek treatment before the osteoporosis progresses. Nurses will be able to use the assessment tool as part of the nursing process as a preventive measure to promote health. In addition to that it will provide the nurses an opportunity to educate patients about health promotion.

DIFFERENCES IN EVOLVABILITY IN RIFAMPICIN-RESISTANT ESCHERICHIA COLI

Mark Kauth

Mentor(s): Jeffrey Barrick (Microbiology and Molecular Genetics), Richard Lenski (Crop and Soil Sciences)

Evolvability describes the capacity of an individual or population to generate descendants with greater fitness in a given environment. Differences in evolvability can arise when mutations are generated at different rates or have different effects on fitness in different genetic background. We generated *Escherichia coli* strains resistant to the antibiotic rifampicin. Rifampicin resistance (Rif^R) is conferred by mutations in a global regulator, the *rpoB* gene encoding the β -subunit of RNA polymerase. These mutations generally cause a fitness disadvantage. The evolvabilities of eight Rif^R mutants were measured using a 640-generation (80 days) marker divergence experiment. It was found that, generally, Rif^R strains quickly accumulated compensatory mutations as predicted by Fisher's geometric model of adaptation, the greater the initial fitness defect, the greater the gain in fitness during evolution. However, Rif^R strains did not evolve to a greater fitness than the wild-type strain during the long term experiment. There were exceptions to the general trend, where similar initial fitness defects in Rif^R mutants generated much different evolvabilities. These exceptions are currently under further investigation.

SUPERCONDUCTING CRITICAL TEMPERATURE SHIFTS IN FERROMAGNET-SUPERCONDUCTOR-FERROMAGNET JUNCTIONS

Andrew Keller

Mentor(s): Norman Birge (Physics and Astronomy)

Ferromagnet/superconductor systems exhibit complicated behavior and are theoretically predicted to yield further unobserved phenomena. In exploring some of these behaviors, thin-film FSF (ferromagnet-superconductor-ferromagnet) samples consisting of permalloy, niobium, and nickel were fabricated by sputtering deposition. The magnetization of one of the ferromagnet layers was pinned and the differences in superconducting critical temperatures between parallel and antiparallel states (states in which the magnetizations of the ferromagnetic layers point in the same or opposite directions) were measured. These states were achieved by exploiting exchange bias with an antiferromagnetic layer of iron manganese, where exchange bias is a phenomenon that results in a shift in the magnetization of a material as a function of magnetic field. Preliminary results show that the critical temperature is lower for the parallel state. This work is a necessary first step prior to studying a similar system without exchange bias.

"AND THE PARTY OF FREEDOM IS WAKING...": THE FORMATION OF THE WISCONSIN REPUBLICAN PARTY IN 1854

Mark Kelly

Mentor(s): David Bailey (History)

In 1854, the Jacksonian Political System, comprised by the Whig and Democratic Parties, imploded and the Republican Party spontaneously appeared to fill the resulting void in the American political scene. My paper explores the original myths of this nascent Republican Party and then extrapolates from these largely local myths to make holistic statements about the process of party reformation. The paper centers on the events that took place in the small frontier hamlet of Ripon, Wisconsin, in 1854. Ripon claims to be the home of the Republican Party, its small one-room schoolhouse hosting the party's "first meeting." This claim is rather ridiculous because the Republican Party evolved from grassroots movements occurring across the North in response to the Kansas-Nebraska Act. However, I argue that Ripon is symbolic of the type of community that so suddenly became politically active. The towns (indeed, the states) that first experienced party reformation were generally western, rural, heterogeneous, predominantly Democratic, and dominated by large populations of radical Northeastern immigrants. I use the state of Wisconsin to exemplify the dynamics of party reformation and then discuss the national implications of my research. Quite strikingly, my model of this process strongly supports the thesis of Eric Foner's book, *Free Soil, Free Labor, Free Men*, which argues that economic concerns created a Midwestern ideology antagonistic to slavery, while refuting William Gienappe's book, *The Origins of the Republican Party*, which conceptualizes party reformation as the result of "ethnocultural conflicts" created the mass immigration of non-English Europeans.

ISOLATION OF NOVEL PLANT POLYMER DEGRADERS FOR USE IN BIOFUEL PRODUCTION

Alex Killinger, Justin Aden, Kelly Borycki

Mentor(s): Thomas Schmidt (Microbiology and Molecular Genetics), Clive Waldron (Microbiology and Molecular Genetics)

The discussion of biofuels is as prevalent today as ever. While the majority of research looks into the fungi microorganisms that have biodegrading capabilities, the experiments performed here researched the capabilities of bacterial microorganisms. Not only that, the main goal of the experiments was to discover novel organisms. In order to discover if these organisms had the ability to degrade plant polymers and if they were novel organisms, first soil samples were taken at KBS. These were rehydrated in a buffer solution and plated out in various dilutions. Colony isolates were obtained by numerous restreaking attempts and finally isolates were grown either under ambient conditions (~10% oxygen) and hypoxic (~2% oxygen). The substrates used to grow the soil samples were corn stover, hemicellulose and lignin. These were chosen because after preliminary research, it was discovered that these substrates were not well researched so it was thought that there would be a higher chance of discovering novel organisms. The final step of the experiment was to run a PCR reaction and obtain viable samples that could be used for sequencing of the 16S rRNA and determination if the organism is novel or not.

ALTERNATIVE HYPOTHESIS CONCERNING HUMAN DISEASE AND MODELS OF COMPENSATORY EVOLUTION IN TRNAS VIA EXPERIMENTS IN SACCHAROMYCES CEREVISIAE

Edita Klimyte

Mentor(s): Barry Williams (Zoology)

Transfer RNAs (tRNAs) are essential for cellular function, and tRNA mutations are disproportionately overrepresented among disease causing mutations in humans. Their role is central to the process of translation, wherein a tRNA attaches to a ribosome to translate a messenger RNA into an amino acid sequence. The mechanisms by which mutations in tRNAs result in disease are largely unknown; however, most theories suggest that mutations likely act to destabilize the secondary structure of the molecule. Once destabilized, the tRNA can no longer properly function, resulting in disease. However, coupled, base-paired mutational differences in tRNAs are commonly observed between species, since presumably both mutations together do not disrupt the secondary structure. Since each mutation alone should have disrupted stability, there has been critical question as to how such paired mutations arise, yet are able to avoid catastrophic health defects. *Saccharomyces cerevisiae* (budding yeast) is an ideal organism to test these hypotheses, because we can directly mutate tRNAs and determine the precise affects in vivo. As in animals, we identified coupled mutational differences between related yeast species. We measured the affects of single and paired mutations, and showed that mutational affects have complex patterns of interactions with each other and the environment, but some mutations carry no affects. These data provide a novel explanation as to how tRNA coupled mutations evolve, demonstrating that tRNA base modifications introduce flexibility in non-canonical Watson-Crick base pairing, which results in mutations that do not destabilize tRNAs, and thereby imply a mechanism for escape from disease.

WALK, RIDE AND LEARN: STUDENTS DISCOVERY OF NATURE ON THEIR ROUTE TO SCHOOL

Whitney Knollenberg

Mentor(s): Christine Vogt (CARRS)

Recently, our society has become concerned with the amount of exposure American children have to the outdoors. Concurrently youth have adopted a sedentary lifestyle that encourages little participation in outdoor activities. Richard Louv (2005) helped to bring this epidemic to the public's attention with his book *Last Child in the Woods*. His definition of "Nature-Deficit Disorder" provides a concrete image of what is lacking in the youngest generation's lives. Walking and biking to school can serve as a way to incorporate physical activity into our children's daily routines and simultaneously combat "Nature-Deficit Disorder." Data from 54 Michigan schools were used to evaluate student's observations of the outdoors on their route to school and how mode of transportation shapes perceptions. Data collection began in Fall 2007 and is ongoing. The study sample consists of 12,722 students from 1st through 8th grade in rural, urban and suburban schools. Student's observations of natural, social, and built structures were studied and compared to mode of transportation. Across all modes of transportation more than 9 out of 10 students observed built structures on their route to school. Eight out of 10 students from all modes of transportation observed natural structures. Social structures were noted the least, with 7 out of 10 students indicating observations. A more detailed analysis of the complete results will be outlined in the poster. A chi-square and phi test were used in the analysis, however no significant relationships were found between perceptions and mode of transportation.

CREATING EFFECTIVE POSTER PRESENTATIONS: EMPLOYING CRAP ACROSS THE DISCIPLINES

Deanna Koenig

Mentor(s): Trixie Smith (WRAC)

Originating in the scientific fields, posters as a mode of presentation have spread to many other academic disciplines. This research study has concentrated on the similarities between different academic fields in terms of expectations and requirements for poster presentations. All fields emphasize the visual aspects of posters; more specifically, they each draw attention to the use of visuals to effectively communicate with a variety of audiences. This presentation focuses on how to apply the major principles of visual rhetoric, as encompassed in the acronym CRAP, to poster construction to ensure effective visual communication, regardless of academic discipline.

EFFECTS OF SALMON AND LOGGING ON INVERTEBRATE POPULATIONS OF THE HYPORHEIC ZONE IN SOUTHEAST ALASKA

Angeline Kosnik

Mentor(s): Richard Merritt (Entomology)

The hyporheic zone in a stream can be defined as the area underneath the open channel where ground water and surface water are able to mix as a result of a porous sediment structure. This unique mixing area provides a habitat for many aquatic insects and other invertebrates that can be indicators to the health of a stream and also act as a key factor in the food webs of many stream dwellers. The dynamics of this specific area of the stream can be easily altered by disturbances in the stream bed and so have an enormous effect on these important invertebrate populations. In the poorly studied hyporheic zone of southeastern Alaskan streams, for example, the disturbance could be caused by the spawning of salmon, where the salmon actually dig into the stream bottom to create a nest. Another disturbance factor includes the clear cutting of trees alongside rivers that result in a change in sediment composition as important root structures are lost. This study focused on discovering whether insects use the hyporheic zone as an isolated safe-zone, or refugia, habitat over time in response to the fall salmon run and also to monitor differences in populations between logged and natural streams. Hyporheic insect samples for this project were taken from Prince of Wales Island in Alaska to study species composition as well as temporal change of these populations in several different streams as a result of these disturbance effects.

THE CHICAGO WORKSHOP MODEL: NORMALIZING OR FRAGMENTING SCIENTIFIC COLLABORATION?

Laura Kovacek, Martin Fox, Christopher Smith

Mentor(s): Ross Emmett (James Madison)

The Chicago School of Economics has produced some of the most influential economic works in the past century. Its success has been credited to a variety of factors including individual brilliance, collaborative communities formed amongst the faculty and the school's workshop structure. The workshop model created an institutional context within which scientific collaboration among faculty and graduate students flourished. The benefit of the workshop model was the opportunity it provided for a common vision of economic science and of the economist's task to emerge through the weekly grind of workshop debate. The workshops, however, provided both the possibility to normalize the disciplinary scope of the school and to fragment the students and faculty into their specific fields. Put differently, did the workshop model bring together the knowledge and vision of varied economists or did it push them further apart into their respective academic niches? One way to understand the role of the workshops is through social network analysis. By analyzing the relationships between individual faculty members from 1960 to 1978, this project attempts to answer the workshop question. Collaborations, acknowledgements, discussions and shared workshops all contribute to the strength of relationships. This strength will then be quantified and used to map the web of Chicago school relationships. Individuals who are broadly connected in this network indicate normalization; those with few connections indicate fragmentation. The networks will show who linked the school together, who were the keys to Chicago's success.

APPROXIMATING THE SCHRODINGER EQUATION USING COMPUTATIONAL CHEMISTRY TECHNIQUES

Anthony Kraus

Mentor(s): James Harrison (Chemistry)

Modern computational chemistry techniques allow one to construct a very accurate potential energy curve for a diatomic molecule in virtually any electronic state from first principles using the Schrodinger equation and the Born-Oppenheimer approximation. These curves may then be used to calculate the number, energies and properties of the vibration-rotational levels of the diatomic. This research resulted in the development of a computer program that calculate these properties given a potential energy curve as a collection of electronic energies at various inter-nuclear distances.

NEURONAL Ca CHANNEL SUBTYPES DIFFERENTIALLY MODIFY SENSITIVITY TO METHYLMERCURY-INDUCED CELL DEATH

Kelly Krcmarik

Mentor(s): William Atchison (Pharmacology and Toxicology)

Voltage gated Ca channels (VGCC) are a sensitive target of methylmercury (MeHg). MeHg blocks current carried through VGCC, but VGCC also contribute to the MeHg-induced elevation of intracellular $[Ca^{2+}]_i$, suggesting that MeHg facilitates VGCC Ca^{2+} influx. This conundrum has been difficult to explain. The objective of this study was to determine if expression of a single phenotype of VGCC in a non-neuronal cell would increase its susceptibility to cytotoxicity induced by MeHg, and to what extent is the subtype of VGCC important? HEK293 cells were transiently transfected with cDNAs for human P/Q- (α_{1A}), N- (α_{1B}), or L-type (α_{1C}) VGCC subunits. Following expression of the recombinant protein, cells were exposed in culture to MeHg (1, 2 or 5 μ M) for 1 or 3 hrs. Cytotoxicity was determined 24 hrs later using a commercial "live/dead" assay. MeHg caused a concentration-dependent increase in cytotoxicity following expression of any of the three VGCC α_1 subunits. Further, cytotoxicity following 3- hrs exposure was greater than that following 1-hr. However, the three VGCC subtypes differentially affected the relative sensitivity of the cells to MeHg. Cells expressing α_{1A} were most sensitive. In contrast, α_{1C} -expressing cells were insensitive and α_{1B} -expressing cells were intermediate in their sensitivity, relatively. In conclusion, VGCC clearly contribute to the cytotoxicity produced by MeHg even in a non-neuronal cell, however there is differential sensitivity depending upon the VGCC subtype. Furthermore L-type VGCC are less sensitive in this regard.

IMPLEMENTING LANDMARKS ON IN-CAR GPS NAVIGATION SYSTEMS

Sean Kristl

Mentor(s): Constantinos Coursaris (Telecom, Information Studies & Media)

Navigation systems are used today to assist drivers in reaching a destination. These systems are more and more prevalent as many auto companies are offering their consumers the option to have them built into their new car. In addition, a consumer can purchase a portable system that suctions to a car's windshield or can be stationed in another suitable place. The screen of the GPS shows the driver on what street his or car is and moves as the car moves. It usually has a computerized voice that tells the driver when to turn or do other maneuvers, and it shows the streets the driver should turn on. Most systems use only the name of streets to lead the driver, but incorporating landmarks may increase the system's usability. Usability is how well something performs and completes a task. Therefore, including landmarks would allow the driver to reach his or her destination with fewer errors and more satisfaction in terms of timeliness and helpfulness. The landmarks would be shown on the GPS screen and the computerized voice would also announce that the driver should turn near the landmark. The experiment will test groups of drivers using GPS systems that do not have landmarks compared to systems that do use landmarks. The amount of errors the drivers make will be recorded and a survey about their experience with each navigation system will be given.

THE EFFECT OF MESSAGE FRAMING ON SMOKING CESSATION

Jennifer Krohn

Mentor(s): Joseph Cesario (Psychology)

Smoking is a serious health problem in America and many individuals try to quit but fail each year. Smoking cessation programs often include informational and inspirational messages to encourage smokers to quit. These messages are more effective if they are framed to match the individuals way of conceptualizing the behavior in terms of why they should do it. Messages are often framed in terms of benefits or costs associated with the behavior. Message framing will provide an even stronger effect if it matches the individuals regulatory focus, the orientation toward a behavior that feels right to the person. People are either more prevention focused or promotion focused, meaning they are motivated and feel right about tasks that emphasize gains or tasks that emphasize the costs of not doing the task. The interaction between message framing and regulatory focus has not been applied to smoking cessation but has shown to be effective for other health behaviors so this is the basis for my project. I theorized that benefit framed messages mixed with a promotion focus will be most effective for helping people not to relapse in the beginning stages of smoking cessation. Since the first week is often the hardest, when cravings are greatest, my study examined the effects of the manipulation over the course of one week with the idea that emphasizing the gains associated with quitting will be the most effective method for initial change compared to emphasizing costs or thinking in terms of prevention.

LONG-TERM IMPACT OF AN OVERSEAS STUDY PROGRAM

Jennifer Kudsin

Mentor(s): Paul Cooke (Communication Sciences and Disorders)

The purpose of this study was to evaluate the professional and personal influence that a college overseas study program has had on its participants several years after college. It is hypothesized that individuals will reflect positively about their college international experience. Data was categorized and analyzed to determine if differences exist as individuals are further from their college international experiences. All subjects had been enrolled as students in the Department of Communicative Sciences and Disorders' summer overseas study program from 1985 - 2004. Subjects responded to statements (on a 1-10 scale) regarding this international program's impact on their personal and professional lives. Some qualitative responses were also collected from open ended questions. The questionnaire was sent to all participants in a 20 year period that the researchers had an updated e-mail address. Individuals who desired to participate filled out the questionnaire online and return it anonymously to SurveyMonkey. Standard statistical procedures were implemented to analyze the data across groups.

INDIVIDUALISM, COLLECTIVISM, AND RACE RELATED STRESS

Grace Kulbaba

Mentor(s): Frederick Leong (Psychology)

Recent studies concerning race related stress have lead researchers to hypothesize about a possible link between racial discrimination and willingness to seek counseling. This study seeks to analyze gender and ethnicity, and how they influence both the perception of race related stress and willingness to

seek counseling. The experiment consisted of a secondary analysis of archival data sets from previously administered surveys. The sample for this study was comprised of 323 college students in the United States, with 64% being from ethnic minority groups. Participants were asked to complete a series of self-report questionnaires concerning Individualism/Collectivism, occupational plans, work values, and family influences. Data were analyzed utilizing 2 x 3 analysis of variance, then examined for differences in manifestation of race related stress and willingness to seek counseling. It is hypothesized that individualism and collectivism, race, and gender will have a significant effect on counseling seeking behaviors. These factors are also hypothesized to significantly influence the perception of race related stress.

THE EFFECT OF FIRE ON NEW CONCRETES

Sri Kumar

Mentor(s): Wasim Khaliq (Civil Engineering)

New types of concrete, like high-strength concrete (HSC) and self-consolidating concrete (SCC), are gaining popularity with structural engineers because of their superior strength. New innovations, like addition of steel and polypropylene fibers, create stronger and more ductile concretes. Increased strength, however, is derived from increased density, resulting in less porosity, an intrinsic property of normal-strength concrete (NSC). While not problematic in normal conditions, this can be devastating to concrete exposed to fires. At elevated temperatures, water in concrete becomes steam, and porosity is critical to its release. Trapped steam causes spalling, in which water vapor expansion becomes explosive, thus reducing strength and member dimensions, and endangering structures to fail. Little high-temperature property data is available for these new concrete types. In this research, mechanical and thermal properties of HSC and SCC with different fibers are studied. The mechanical properties under investigation are strength and resilience. Specimens of HSC and SCC (further subdivided into eight types with fiber content) were heated as per RILEM standards at 120°C per hour until internal temperature reached 200, 400, or 600°C. The specimens, while hot, underwent an ASTM C39 standard axial-compression test. Axial length variation, temperature change, and type of failure were recorded. The failure loads and corresponding stress-strain relationships will be analyzed and compared to similar residual strength tests on room-temperature specimens. The data can thus develop constitutive models for these new concretes exposed to extreme temperatures of fires, which will aid in computer modeling of structures, yielding significantly safer and economical building designs.

ARE ROOT PROBLEMS INVOLVED IN LEAF SCORCH?

Phillip Kurzeja

Mentor(s): Gerry Adams (Plant Pathology/Biology), Paul Swartz (Campus Grounds), Frank Telewski (Plant Biology)

Leaf scorch is a common symptom of declining trees in the landscape, especially Northern red oaks, *Quercus rubra*. Leaf scorch may be caused by a xylem-delimited bacterial pathogen or by environmental and physiological factors. We are investigating the physiological problems that may cause leaf scorch and are hoping to develop recommendations for treating the disorder. Trees infected by pathogens have been excluded from our studies. Established trees with a known history of leaf scorch are systematically evaluated for depth of root flare, girdling root severity, soil compaction (resistance and bulk density), and soil profile to examine site problems. Photosynthesis efficiency, leaf xylem pressure, leaf water conductance, leaf transpiration, stem hydraulic conductivity and plant tissue nutrition are measured to examine differences in physiological function between scorched and non-scorched oaks on the same site and among sites. The above measured parameters are each studied for interaction with and correlation to the presence and severity of leaf scorch symptoms. Scorched trees exhibited greater planting depth than non-scorched trees, and lower levels of manganese, photosynthesis efficiency, xylem pressure, conductance, and transpiration in May but not by July. Trial treatments planned for next season are discussed. A better understanding of the functional capabilities of girdling roots in oaks was needed to interpret water stress. A derivative research project that may help address this deficit in knowledge is initiated and described.

PRODUCTION OF HIGH VALUE OILS FROM ALGAE

Chad LaFeldt, Andrew Miller, Joshua Woods

Mentor(s): Ramani Narayan (Chemical Engineering & Material Sciences), S. Patrick Walton (Chemical Engineering & Materials Science)

Algae are diverse photosynthetic organisms that are known to contain a majority of their weight as oil. The most prominent research frontier with algae is extracting these oils and converting them into a sustainable fuel source such as biodiesel. However, there are several other high value oils that can be extracted from algae that are incredible useful and not widely produced. The goal of this project is to be able to culture, harvest, extract, analyze and then chemically modify these oils into useful high value products such as health supplements and lubricants. We are currently studying the biomass and lipid density of two species of algae, *Synechocystis* PC6803 and *Nannochloropsis Oculata* under mixotrophic and phototropic growth conditions. The algae are being grown in BG-11 medium with three culture conditions, 30 mM glucose solution, 30 mM sodium bicarbonate solution and media containing no additional carbon source. The algae are grown in a 18:6 hour light/dark cycle under constant rotation in an orbital shaker. A comparative study between the biomass density and lipid density of the algae under the different carbon regimes will give insight into how additional carbon sources affect lipid accumulation and profile.

EXPORTING DEATH: PROMOTING AMERICAN TOBACCO PRODUCTS IN CHINA

Jennifer LaGosh

Mentor(s): Mary Bresnahan (Communication)

Due to stronger regulations on tobacco advertising and an increase in anti-tobacco campaigns, smoking in the United States has continued to decrease over the last few years. American tobacco companies are struggling to sell cigarettes to Americans. Companies such as Philip Morris and R.J. Reynolds have begun to target other countries. The greatest target market for these tobacco companies has been China. China consumes 31% of the world's cigarettes. If we do not begin creating more awareness of the dangers of smoking and place more restrictions on tobacco marketing abroad, China will lose many citizens to smoking. It is predicted that of all the children alive today in China under the age of 20 years, 50 million of them will eventually die from tobacco.

DEVELOPMENT OF INTERLIMB COORDINATION IN FOALS

Jasmine Lane

Mentor(s): Sandra Neuwelaerts (LACS)

Horses use three distinct gaits: walk, trot or canter. Within an hour after birth foals are capable of moving quickly with the herd. This study tests if foals express the same gaits as adult horses right after birth and if not how long it takes to develop mature gaits. This was examined by video taping the foals' out on pasture daily for one week, weekly for the first month, then monthly for five months. The videos were first used to count the occurrence of each gait visually. Then the timing of the footfall patterns was measured for sixty strides on day 1, 7, 28, 54 and 140. Duty factor for each hoof, ipsilaterality for both sides, and hind limb lag were calculated for a random selection of 60 strides. Duty factor is defined as the duration of hoof contact as a percentage

of the stride duration. Ipsilaterality is the relative timing of the hoofs on the same side of the body and hind limb lag is the relative timing between the two hind limbs. In spite of inter-individual variations the general pattern shows that (1) duty factors are higher for the young foal, (2) in the beginning the foals try many different footfall patterns and (3) over time the footfall patterns become defined gaits. Our interpretation of these results is that the foals' priority at early age is stability. This is accomplished by increasing the duty factor. Motor learning is responsible for a more defined interlimb coordination at a later age.

LANGUAGE VARIATION AND ITS EFFECT ON THE BELIEVABILITY OF SOCIAL NORMS MESSAGES

Carolyn LaPlante

Mentor(s): Sandi Smith (Communication)

High risk alcohol consumption is a significant problem on college campuses that many universities are taking steps to reduce. Social norms campaigns are one method of doing so, which are based upon perceptions of behaviors of the majority of a population. To address college drinking, these campaigns determine the alcohol consumption behaviors of the students through survey research and report the findings back to the population. The basic message of many of these campaigns is that "Most students drink moderately," however, the language used to present this message can be varied. Pilot interviews conducted with students at MSU revealed that the language choices can affect the level of believability of the message; these students said that words like "most" and "moderately" were too vague and made the message unbelievable. Thus, as believability is of central importance to social norms campaigns because studies have shown it to contribute to their success, this study uses surveys to test different forms of the message previously discussed. Each respondent will see one of four messages, which will vary in their use of "most," "moderately," percentages (e.g. "54% of students"), and numbers (e.g. "0-4 drinks"), then will report on how believable they thought the message was, along with other information about their drinking behaviors and demographics. The results of this study, which are forthcoming, will provide insight as to whether the use of certain language makes social norms messages more believable, and will be valuable to anyone creating social norms campaigns.

THE ROLE OF THE JUMONJI-DOMAIN CONTAINING PROTEINS IN ARABIDOPSIS THALIANA

Jacqueline Lapp

Mentor(s): Steven van Nocker (Horticulture)

The chromosomal context of a DNA sequence is crucial to its biological activity partly because of important regulatory effects of the main DNA-packaging proteins, the core histones. The core histones can be modified post-translationally by adding or removing small chemical groups (acetyl, methyl, phosphoryl), and proteins (ubiquitin and SUMO). Distinct histone modifications can generate synergistic or antagonistic interaction with chromatin-associated proteins, which play an important role in many biological activities including gene transcription. Recently, JumonjiC-domain containing proteins (Jumonji proteins) have been found to be required for transcriptional regulation by removing methyl group from core histones. However, the biological function of Jumonji proteins remains to be elucidated. To further investigate the Jumonji protein's role in growth and development we have examined the patterns of expression and phylogenetic relatedness of the proteins. We also attempted to knock down each of the 21 Jumonji genes in Arabidopsis using artificial microRNA technology. We are analyzing each transgenic line for defects in growth and development.

PSYCHOLOGICAL CARE FOR RAPE VICTIMS IN AFRICAN CONFLICT SITUATIONS

Jacqueline LaRouere

Mentor(s): Claudia Garcia-Moreno (World Health Organization), Jane Cottingham (World Health Organization), Mark van Ommeren (World Health Organization)

This project details a literature review and analysis of post-rape psychological care, specifically in African conflict regions. This research was conducted during my internship at the World Health Organization in Geneva, Switzerland under the direction of Dr. Claudia Garcia-Moreno, Dr. Mark van Ommeren, and Jane Cottingham. Current literature on effective psychological care for rape victims in conflict zones is minimal, revealing the scarcity of mental healthcare available there. Research done in Western countries indicates that cognitive behavioral therapies, which include a retelling and restructuring of rape memories, can help to alleviate symptoms of the Post-Traumatic Stress Disorder (PTSD) that often follows sexual assault. Cognitive behavioral therapy is resource intensive, and in many of these African conflict regions, it could not be feasibly implemented. Because rape is being used as a weapon of war, there are hundreds of thousands of victims. In these regions, healthcare facilities are often nonexistent or busy with cases of acute illness. However, there are many aid organizations administering psychological care to rape victims, usually in conjunction with other health interventions. Workshops on empathy and psychological support given to these field workers have shown promise in preparing them to give adequate mental health support to rape victims. Preliminary evidence has shown that the method of psychological debriefing, which includes a brief retelling of the rape memory, increases the incidence of PTSD. This research makes apparent the need to avoid psychological debriefing, administer cognitive behavioral therapy when possible, and to use unobtrusive empathy with rape victims when no other treatment options are available.

THE RELATIONSHIP BETWEEN REIN TENSION AND NATURAL OSCILLATIONS OF THE HEAD AND NECK IN THE TROTting HORSE

Britt Larson

Mentor(s): Hilary Clayton (Large Animal Clinical Sciences)

Reins are a vital means of communication between horse and rider. Previous studies have shown that rein tension during horseback riding exhibits two 'spikes' during each trot stride that occur in association with the stance phases. In addition, data in the literature describe intrinsic oscillations of the head and neck at the trot that also occur twice during each stride. This study seeks to describe the relationship between the peaks in rein tension and these oscillations. Kinematic analysis was performed on ten riderless horses using a motion analysis system which tracked the positions of reflective markers placed on the facial crest, the atlas, the base of the neck (the position of C6), a surcingle around the horse's girth, and each hoof. Side reins of varying materials (inelastic aluminum chains and blue and gold Thera-Band®) and lengths (70 cm to 120 cm) were attached from the bit to a girth and rein tension was measured with strain gauges. The head and neck were found to oscillate diagonally, forward and down, in rhythm with the stride, and this motion, as well as the rein tension maxima, was in coordination with the stance phases. The rein tension without a rider followed a similar pattern of 'spiking' as with a rider but with a slightly lower magnitude, leading to the interpretation that the majority of rein tension, and the 'spikes', are caused by the horse as its head and neck oscillate at the trot.

THE WRITING CENTER AND DIGITAL LITERACIES

John Lauckner

Mentor(s): Trixie Smith (WRAC)

The Professional Writing (PW) major is a unique major in the fact that it requires the use of several digital literacies in order to complete the degree. These literacies include Photoshop, CSS, XHTML, Powerpoint, Camtasia, and more. Because of the digital focus that the PW major requires, it is being

used as a case study for expanding digital literacies in the MSU Writing Center. The session will focus on survey and interview research that was conducted in order to find out what PW students want out of the Writing Center. It will also explain specific types of projects and mediums PW students would like help with and how such help relates to the MSU Writing Center's mission. After highlighting the needs of PW students, the session will explain how our center plans to complete the task of expanding digital literacies. It will discuss the MSU Writing Center's Digital Writing Consultants (DWC) and how these consultants can help with this task. Time will also be spent talking about the possibility of creating podcasts, workshops, and online spaces that can help the Writing Center to address students' digital composing needs.

INDUCTION OF APOPTOTIC ACTIVITY IN HACAT CELLS BY TYPE I INTERFERONS (ALPHA AND BETA)

Douglas Laurain

Mentor(s): Animesh Sinha (Dermatology and Cutaneous Sciences)

Apoptotic events play a major role in maintaining cellular homeostasis and occur as a part of normal keratinocyte differentiation. Altered apoptosis has been associated with a number of disease states, including lupus erythematosus (LE). Increased apoptosis in the skin of cutaneous LE (CLE) lesions may contribute to an overload of self-antigen exposure leading to autoimmune activation. Interferons (IFNs) are cytokine regulators that appear to be central in the pathogenesis of LE. In addition to their role in mounting a defense response towards viral infection, IFNs also impact apoptotic events. Type I IFNs consist of several species, most predominantly IFN α and IFN β . However, the differential effects of specific type I IFNs in the keratinocyte associated apoptotic pathways are unclear. Although IFN has been shown to induce apoptosis in various cell types including epithelial cells, the direct effects of IFN on keratinocytes have not been reported. We examined apoptosis in the HaCaT human keratinocyte cell line with and without stimulation by IFN α and IFN β . Functional consequence (apoptosis) was assessed using the Annexin V-FITC apoptosis detection kit I by flow cytometry (Becton Dickinson FACS Vantage). We demonstrate that similar to IFN α , IFN β is capable of inducing apoptosis in HaCaT cells. Moreover, we observed increased apoptotic activity in a dose, but not time dependent manner in HaCaT cells induced by IFN α and IFN β . These findings are relevant to our fuller understanding of type I IFN regulation of apoptotic processes in the skin that promote immune dysregulation.

PUBERTAL DEVELOPMENT OF THE SEXUAL DOPAMINERGIC SYSTEM IN MALE HAMSTERS

Bradley Lawrence

Mentor(s): Cheryl Sisk (Neuroscience)

Dopamine (DA) release in the medial preoptic area (mPOA) has been shown to be important for facilitation of male copulatory behavior in rodents, but neither DA release nor behavior occurs before puberty. Therefore, changes in dopaminergic circuitry during puberty may be responsible for the increased release of this neurotransmitter and subsequent changes in sexual behavior following adolescence. This study investigates the developmental profile of DA neurons in a variety of nuclei including the periventricular nucleus (Pe, A14) and zona incerta (ZI, A13), from pre-puberty through adulthood. This research will demonstrate how the DA nuclei believed to be involved in regulating copulatory behaviors develop over puberty. Brain tissue from 21, 35, 49, and 63 day old hamsters was collected and coronally sectioned. Next, DA neurons were visualized using immunohistochemical processes targeted for tyrosine hydroxylase (TH), the enzyme present in neurons used to produce this neurotransmitter. Finally, the number of TH expressing, DA, neurons per unit area in the Pe and ZI are currently being determined for each age group, in order to examine the differences between these age groups. Research in this area is important in furthering our knowledge of how copulatory behaviors may manifest themselves throughout puberty. My presentation will begin with a short review of significant background information, followed by an explanation of my research and the experimental methods used in this study. I will then present my results, discuss their meaning, and conclude my presentation with future directions for this research.

EVALUATION OF INTERIOR DESIGN IN MICHIGAN STATE UNIVERSITY'S CLASSROOMS FOR IMPROVED QUALITY OF INSTRUCTION

Ha-Na Lee

Mentor(s): April Allen (School of Planning, Design and Construction)

Effective communication, versatile use of a space, and physical comfort in a classroom are essential to the success of both students and faculty. All of those conditions are closely related to interior design elements in the space. It is very important to diagnose design problems and find solutions in the space because they greatly affect the quality of the class activities and even students' attitudes of participation during class. This research provides analytical documentation of various interior design issues in MSU classrooms. Classroom types were divided into three categories: broad classrooms (room size more than 70 students), traditional classrooms (room size less than 70 students), and technology classrooms (computer labs). In each category, ten classrooms were randomly selected from older MSU buildings to recently renovated buildings and recorded as photographs. Among each category, classrooms were divided into similar styles and compared. Based on site visit and field measurements, classroom designs were evaluated in terms of the rate of communication effectiveness, versatility in use and ergonomic function. This documentation includes overall design problems of every classroom as well as specific problems from each category of the classrooms. From comparison between the positive and negative aspects of MSU classroom designs, this research also discusses correlation between historical backgrounds of the building and the interior design problems. From all of these analytic evaluations, this project provides suggestions for future design solutions.

REGULATION OF C-SIGNAL-DEPENDENT PROMOTER 4403 IN MYXOCOCCUS XANTHUS

Jun-seok Lee

Mentor(s): Lee Kroos (Biochemistry and Molecular Biology)

Mycococcus xanthus is a social bacterium that can glide on solid surfaces and prey on other bacteria in topsoil. Upon starvation, *M. xanthus* forms multicellular fruiting bodies, each containing approximately 10^5 cells. This developmental process provides a model to study cell behavior in biofilms, including how cell-cell signaling regulates gene expression. C-signaling is essential for fruiting body development, but the mechanism remains a mystery. C-signaling appears to involve cell-cell contact, which is unusual for bacteria (most signals are diffusible). To understand how C-signaling regulates gene expression, the promoter regions of several C-signal-dependent genes have been characterized, including one called 4403. Since two transcription factors (MrpC2 and FruA) have been shown to bind cooperatively to the promoter regions of 3 other C-signal-dependent genes, electrophoretic mobility shift assays (EMSAs) were used to test for binding to the 4403 promoter region. With 4403 DNA from -80 to -16 (relative to the transcriptional start site), MrpC2 produced 2 abundant shifted complexes, FruA produced 1 complex, and the combination of proteins showed enhanced formation of shifted complexes, indicative of cooperative binding. EMSAs with shorter or mutant DNA fragments support a model in which MrpC2 binds to at least 2 sites to repress promoter activity, and C-signal-dependent activation of FruA allows it to displace MrpC2 from the downstream site to activate transcription. This model proposes a novel regulatory mechanism for the 4403 gene, whose expression depends absolutely on C-signaling, as compared with other genes that have been studied, whose expression depends only in part on C-signaling.

HAPLOTYPE ANALYSIS OF THE OTOF GENE REGION AS A POSSIBLE CAUSE OF DEAFNESS IN AN INDIVIDUAL

Lawrence Lee

Mentor(s): Meghan Drummond (Human and Animal Genetics), Karen Friderici (Microbiology and Molecular Genetics)

OTOF is a gene that encodes otoferlin, a protein located in the brain and the cochlea. Its exact function is not entirely known, but it appears to play an essential role in normal hearing by releasing chemical signals from nerve cells that innervate the cochlea. Single-nucleotide substitutions in the OTOF gene are known to cause nonsyndromic hearing loss. In an extended family with many individuals with hearing loss, our lab has previously shown that most are deaf due to mutations in Connexin 26, the most frequent cause of recessive hearing loss. However, one patient in the pedigree was not deaf due to a mutation in Connexin 26. In an effort to discover the cause for her condition, we chose OTOF as a candidate gene due to past research indicating that mutations in otoferlin are a frequent cause of hearing loss. The main objective of this study was to determine if a mutation in OTOF is responsible for the patient's deafness. Four SNPs were chosen throughout the OTOF region and RFLP assays were designed to determine the genotype of the patient, her siblings and parents. My results rule out the possibility that OTOF mutation is the cause of deafness in this individual through haplotype analysis.

ASSESSMENT OF DEPRESSION IN PERSONS EXPERIENCING THE EARLY STAGES OF ALZHEIMER DISEASE

John Leefers

Mentor(s): Shannon Sykes (College of Nursing)

The U.S. Census Bureau (2008) suggests that by the year 2010, there will be 40 million residents of the United States over the age of 65. Furthermore, they project that that number will double before the year 2040. 14% of the elderly population over the age of 70 will develop Alzheimer disease (AD) or another kind of dementia (Plassman et. al 2007). Persons with very early stage AD are faced with the expected loss of their identities, memories, and functionality. This population often experiences fear, anxiety, and depression related to these stressors (Martin 2008, Gilmore & Huntington 2005). Psychiatric and chronic medical diagnoses greatly increase the risk for suicide in older adults (Valente, 2008). This combination of factors suggests that depression should be a priority assessment in the early stages of AD. The Geriatric Depression Scale (GDS) and Cornell Scale for Depression in Dementia (CSDD) are both valid tools for measuring severity of depression. Neither, however, directly address the experiences of a person in the very early stages of AD. A screening tool should be developed that is tailored to the experiences of very early AD patients. It should be a tool that can be easily utilized by homecare nurses to quickly and effectively assess depression, as many patients in this population are in the homecare setting. The tool should act as an indicator that further assessment of the patient by a qualified mental health professional is required.

A RELATIONSHIP BETWEEN AN ENZYMATIC MODIFIED STARCH AND WATER

Andre Legowo

Mentor(s): Eva Almenar (Packaging)

Cyclodextrins (CDs) are ring-shaped sugar-based molecules that have a high water affinity. CDs are formed as a result of enzymatic conversion of starch. Since CDs are essentially starch, thus it is a biodegradable material. There are three types of natural CDs: alpha, beta and gamma with six, seven, and eight sugar ring molecules, respectively, creating a cone shape. CDs have the capability to form host-guest complexes because of their structure (rings are containing both hydrophobic and hydrophilic regions) and so they can be used in a number of applications in a wide range of fields. CDs are now widely used in the food, pharmaceutical and chemical industries as well as agriculture and environmental engineering and also packaging industries. The purpose of this study was to learn the relationship between CDs and water to increase the number of applications of this modified starch. Several tests were done by gravimetric measurements using VTI SGA-100 moisture sorption analyzer. Different CDs were exposed to different relative humidity within a period of time until equilibrium was reached in a 23 C environments. The results revealed the relationship between each CDs and water and that gamma CDs has the highest affinity to water. From the results, the number of water molecules that can be absorbed by each CD was calculated.

COMPREHENSION AND RETENTION OF DIFFERENT TEXT TYPES ACROSS LANGUAGES

Mallorie Leinenger

Mentor(s): Erik Altmann (Psychology)

As university students, whether we are taking classes in literature or biochemistry, we find ourselves confronted by reading material that we are expected to read and later recall when exam time comes. Do you ever find that readings you do for one class really stick, while readings for a different class elude you the next day? Perhaps this difference in retention stems from the difference in the types of texts these classes require. Expository texts, such as you would find in biochemistry, are more technical in nature and deal with hard facts. On the other hand, narrative texts tell a story and utilize eloquent, figurative language. I am studying firstly if a difference between recall of different text types exists. Secondly, if there is a significant difference, I want to know if this difference is only seen in text recall, or if there is also a difference in original comprehension. Furthermore, I am interested in whether or not these differences hold true for texts read in one's second language, or if they are increased or altered in some way. By testing native English speakers who have advanced Spanish-speaking abilities, I hope to determine this as well. If I determine that the mechanisms of encoding and/or recall of texts in one's native language versus their second language are somehow different, it may help to better understand how we process and recall items that we encounter in languages other than our native tongue.

GEOGRAPHIC RACIAL EQUALITY BETWEEN AMERICAN INDIANS AND WHITES IN GRADY COUNTY, OKLAHOMA

Michelle Leppek

Mentor(s): Joe Darden (Geography)

Previous research has shown consistent gaps between American Indians and Whites in factors such as education, income, and occupation. This study examines these socioeconomic variables along with residential segregation in municipalities within Grady County, Oklahoma to determine if geographic racial equality is present between American Indians and Whites. Data was obtained from the 2000 United States Census Summary File 4. A ratio comparison was used to evaluate American Indians and Whites in the aspects of income, occupation, and education. The index of dissimilarity based on census tracts was used to determine the amount of segregation between American Indians and Whites in the municipalities of Grady County. The results revealed that a single municipality, Chickasha City, was found to have geographic racial equality.

CREATING MEDIA MESSAGES TO INCREASE ASIAN IMMIGRANT ACCESS TO HEALTHCARE IN METRO DETROIT

Jenni Lewis

Mentor(s): Geri Zeldes (journalism)

The purpose of this research project is to create health communication media messages focused on increasing the healthcare use and access of Asian and Pacific Islander immigrant children and their families in the Metro Detroit area. This project will create linguistically and culturally appropriate videos, brochures and a Web site that will educate APIs about the U.S. health care system, and guide APIs to resources that will help them seek affordable health

care options for them and their children. We are applying for a \$40,000 grant (18 months) from the Families and Communities Together Coalition. Successful completion of this grant will be measured by exposure - how many APIs view and read the media messages. Our proposal fits in the theme of Families and Communities Diversity and Disparities as it seeks to narrow a healthcare access gap experienced among APIs, which is the fastest growing ethnic group in Michigan.

ARABS, JEWS AND THE NEWS DOCUMENTARY

Jessica Lipowski, Jennifer Orlando

Mentor(s): Geri Alumit-Zeldes (Journalism)

We are looking at how Arab Americans and the Jewish community are portrayed in the media, specifically focusing on the July 2006 War in Lebanon. While there were tensions between these communities abroad, there was also turmoil between these same populations in the Metro Detroit area. Many people became caught in the crossfire, both literally and figuratively, as relatives were trapped abroad and the dialogue between the communities became heated. Quite a few people held opinions both in the local population and in the media. These opinions caused controversy. Starting with this base, we began our work under Dr. Geri Zeldes, helping continue her first documentary titled, "Arabs, Jews and the News." Through archival research, transcriptions, theming concepts found in interviews, and extensive communication and organization through the Wiki, we have formulated the materials needed to better understand the fragile relationship between Arab Americans and Jewish communities. Not only does this research help us further our careers in the journalism arena, but it also helps the public become knowledgeable in the affairs addressed in the documentary. It is obvious that neither side – the Arab Americans and the Jewish communities – are correct in their assumptions of each other, however, the media provides one of the best means to document opposing views and beliefs. Editorials also proved helpful in looking into the views held by both sides and outside bystanders. We're presenting our research and methods used to capture the intersection of Arabs, Jews and the news.

ROLE OF CASPASE 2 IN TYPE I DIABETIC BONE LOSS

Dennean Lippner

Mentor(s): Laura McCabe (Physiology)

Type I (T1-) diabetes is an autoimmune disease that results in bone loss. One potential mechanism of T1-diabetic bone loss is increased osteoblast (bone forming cell) apoptosis. Cell death (apoptosis) can be induced through several different pathways. One of these pathways, the extrinsic apoptosis pathway, results in caspase 2 activation, nuclear damage and cell death. To determine if this pathway is responsible for osteoblast death and bone loss in T1-diabetes, diabetes was induced in wildtype (WT) and caspase 2 knockout (KO) mice (mice lacking caspase 2 protein expression) and bone phenotypes were compared relative to corresponding non-diabetic mice. Utilizing tibia RNA analysis, osteoblast markers Runx2 and osteocalcin were decreased by 50% in both WT and KO diabetic compared to control mice. This indicates that deficiency of caspase 2 is not sufficient to prevent diabetes induced suppression of osteoblast phenotype. However, elevation of aP2 expression, an adipocyte marker, in the WT diabetic mice was prevented in the KO diabetic mice, suggesting that caspase 2 deficiency prevents bone marrow adiposity from increasing in diabetic mice. Overall, these results suggest that caspase 2 is required for T1-diabetic induced marrow adiposity but not bone loss. Another apoptotic pathway may be responsible for the bone loss associated with diabetes and is currently under investigation. Ultimately, a greater understanding of the mechanisms of bone cell death in T1-diabetes can contribute to identification of therapeutic targets to prevent bone loss as a side-effect of type I diabetes.

THE INFLUENCE OF SHAKUHACHI MUSIC ON MAI BY RYO NODA

Nicolas Lira

Mentor(s): Joseph Luloff (Music)

Saxophone students in the United States have few resources to educate themselves on the composition and performance of Ryo Noda's avant-garde music. Many of his compositions stress musical elements and techniques of traditional Japanese Shakuhachi flute music. Most musicians in the Western Hemisphere have a very limited knowledge of traditional Japanese music. Japanese music has much more freedom in rhythm and meter than European music. Listening to recordings of Shakuhachi music and the music of Ryo Noda I developed an understanding for the phrasing used in this style of music, while working on the extended techniques required in repertoire such as "Mai". The music demands considerable control of the saxophone, emphasizing details such as altering tone color, precise articulation and the effective use of silence. Tension develops from evolving textures in the music rather than the rise and fall of a melody.

CIS REGULATORY GRAMMAR AND SYSTEMS BIOLOGY

Xiaozhou Liu

Mentor(s): David Arnosti (Biochemistry)

The study of *Drosophila melanogaster* developmental networks offer insights into gene regulation that can illuminate similar processes in mammals and contribute to understanding and treating disease in humans. The developmental network of *D. melanogaster* consists of a well-defined hierarchy of maternal (inherited from the mother) and zygotic (generated within the egg itself) gene products that regulate the development sequentially. One of these zygotic genes is called giant, encoding the transcription factor Giant. In my study, I explored the effect of Giant on the expression of the artificially introduced lacZ reporter gene. Three constructs of transgenic flies were prepared using P-element mediated germline transformation. Embryos were stained and the patterns of gene expression were visualized using fluorescent in-situ hybridization. Our lab has discovered that the Giant protein represses the expression of lacZ gene by binding upstream to the promoter, and the effect on repression is context dependent, depending on the embryonic distribution of Giant protein, the architecture of the enhancer, as well as the distance of the binding site from those of other transcription factors. Therefore, we built a mathematical model that predicts the effect of novel enhancer architecture on the lacZ expression. Of the nineteen transgenic constructs, sixteen were used to optimize the parameters within the model. My constructs will later be used to further optimize the parameters so that the predictive power of the model can be improved.

IN SEARCH OF GEOGRAPHIC RACIAL EQUALITY IN METRO-DETROIT

Maria Lockhart

Mentor(s): Joe Darden (Geography)

Within the counties of Metro-Detroit there are cities that have very different demographics. Throughout a majority of these cities, there exists racial inequality and a high level of residential segregation between blacks and whites. While racial inequality and high levels of segregation are most prevalent in Metro-Detroit, I hypothesize that there are a few cities that do not follow the norm and are considered places of geographic racial equality. These are places where blacks and whites are equal in socioeconomic status and share residential spaces i.e. are residentially integrated. Data was obtained from the 2000 United States Bureau of the Census SF4. The variables selected were median income, educational attainment (the percent of the

population 25 years and older with a bachelor's degree or higher), and the percent of the population holding management, professional or related occupations. Simple ratios were used to compare blacks and whites. Finally to assess the level of residential segregation, census tract data was used and the index of dissimilarity was employed to determine the unevenness in the spatial distribution of blacks and whites over census tracts (neighborhoods). The index ranges from "0" no segregation to "100" complete segregation. The higher the index, the greater is the level of residential segregation. Geographic racial equality was found in a few places in Oakland county. Thus, my hypothesis was accepted.

EFFECTS OF URBANIZATION AND HUMAN ACTIVITY ON SCIURUS CAROLINENSIS BEHAVIOR: CASE STUDY AT MICHIGAN STATE UNIVERSITY **Kaitlin Lonc**

Mentor(s): Michele Johnson (Zoology)

As human development results in increasing numbers of urbanized areas and fragmented natural habitats, animals are living in closer contact with humans. In order to adapt to these changing environments, many species exhibit behavioral changes in response to human activity. Understanding these behavioral changes is critical to continuing conservation efforts of species living in urbanized areas. One such species that has undergone a dramatic adaptation to urban habitats is the Eastern gray squirrel, *Sciurus carolinensis*. In this study, I observed flight initiation distance and behavioral pattern frequencies in an urbanized and non-urbanized treatment area on Michigan State University's campus. Although squirrels from the two areas did not differ in overall behavior patterns, I found that squirrels in the non-urbanized area had a flight initiation distance (FID: the distance an individual squirrel fled on perceiving a human) that was six times greater than those in the urbanized area. My results show that squirrels in an urbanized area are more tolerant of human activity than those in a non-urbanized area.

HOW WELL DO COLLEGE CAMPUSES SUPPORT US TO BE PHYSICALLY ACTIVE?

Kristin Long

Mentor(s): Sharon Hoerr (Food Science and Human Nutrition)

The purpose of this project was to assess the essential aspects of college campus environments influencing walking and bicycling for both recreational and transportation purposes which contribute to physical activity of the students and staff. The setting was a large college campus (46,045 students and 11,000 staff/employees on 5,200 acres). In fall 2008, four trained evaluators rated the pedestrian navigability of academic and residential areas of the campus using a 10-item assessment tool developed for this project. The assessment areas were divided into 51 segments. Each evaluator assessed ~20 segments during the day and ~5 segments at night. For each segment, the following were rated on a scale from 1 (poor) to 5 (ideal): (A)available pedestrian facilities, (B)pedestrian safety factors, (C)crosswalks, (D)nighttime safety features, (E)maintenance, (F)path size, (G)traffic buffers, (H)universal accessibility, (I)aesthetics, (J)bikeability, (K)hills, and (L)shade, were graded on a scale from 1 (poor) to 5 (ideal). The score for each segment was calculated as follows: daytime segment= $[\text{SUM(A:C)}*3+\text{SUM(E:K)}*2+L]/120*100$ (range: 20-100), or nighttime segment= $[\text{SUM(A:D)}*3+\text{SUM(E:K)}*2]/130*100$ (range: 36.2-100). There were 39 segments in academic areas and 12 segments in residential areas. The mean score was 87.3 (range 20-100) for academic areas and 63.9 (range: 20-100) for residential areas, suggesting that campus segments were more supportive of walking/biking than were off-campus residential areas. Since a large number of students and staff live on campus, improvement of the residential area environments would be an effective way to increase physical activity on campus.

DISCRIMINATION OF FRESHWATER MICROBIOFILM ARCHITECTURES USING THE CMEIAS-2 MORPHOTYPE CLASSIFIER

Ryan Longueuil

Mentor(s): Frank Dazzo (Microbiology and Molecular Genetics)

CMEIAS, the Center for Microbial Ecology Image Analysis System, is a software program designed to analyze digital images of bacterial communities. The CMEIAS-2 morphotype classifier applies series of pattern recognition algorithms to each object in an image, then generates a classification based on 11 major microbial morphotypes. In previous usage, CMEIAS-2 was applied to 100x objective lens images in which individual bacteria could be clearly differentiated and classified. In this study, CMEIAS-2 was used to generate classification data from 1x and 10x images in which the objects being analyzed would be biofilm objects rather than bacteria. This morphotype data was compared with a variety of statistics to determine which among them would differentiate between data taken from biofilms growing on 5 different surface chemistries. Sampling statistics were applied to determine from which object threshold size the most differentiable data resulted. The data from the optimized threshold size of 50 pixels was then used in combination with ecological statistics to compare between all surface treatments at 1x, all at 10x, and between equivalent surface chemistries at 1x and 10x. The non-binary similarity statistics and all diversity indices except for two were almost entirely consistent in their differentiation between surface chemistries within the 1x and 10x objective lens data sets. Differentiation was also shown between equivalent 1x and 10x data, but not to the same degree of consistency as within the same magnification level.

EVOLUTION OF FRUIT TYPES AND SEED DISPERSAL: A PHYLOGENETIC AND ECOLOGICAL SNAPSHOT

Claire Lorts

Mentor(s): Tao Sang (Plant Biology)

Success of flowering plants is greatly dependent on effective seed dispersal. Specific fruit types aid different mechanisms of seed dispersal. However, little is known about what evolutionary forces have driven the diversification of fruit types and whether there were phylogenetic constraints on fruit evolution among angiosperm lineages. To address these questions, we first surveyed the orders and families of angiosperms for fruit types and found no clear association between fruit types and major angiosperm lineages, suggesting there was little phylogenetic constraint on fruit evolution at this level. We then surveyed fruit types found in two contrasting habitats: an open habitat including the Indian desert and North American plains and prairies, and a closed forest habitat of Australian tropical forest. The majority of genera in the survey of tropical forests in Australia were fleshy fruit trees, whereas the majority of genera in the survey of prairies and plains in central North America were herbs with capsules and achenes. Both capsules and achenes are frequently dispersed by wind in the open, arid habitat, whereas fleshy fruits are generally dispersed by animals. Since desert and plains tend to provide continuous wind to aid dispersal and there are more abundant mammal and bird dispersers in the closed forest, this survey suggests that fruit evolution was driven at least in part by dispersal agents abundant in particular habitats.

USING DENDROCHRONOLOGICAL TECHNIQUES TO INVESTIGATE THE EFFECTS OF GLOBAL WARMING ON LARIX LARICINA

Morgan Lucke, Kathleen Peshek

Mentor(s): Jennifer Lau (Kellogg Biological Station Nat. Sci.), Nathan Siegert (Entomology Agriculture And Natural Res)

Global warming is expected to have various ecological and evolutionary impacts on plant populations. Several studies have transplanted genotypes from northern populations to southern, warmer environments plus moving genotypes from southern populations to northern, cooler environments. If northern genotypes moved to southern sites experience a decrease in fitness; global warming may have large negative impacts on plant populations,

such as decreased population growth rate, shifts in range, and possibly extinction. Most transplant studies ignore other factors that may vary based on latitude (e.g., soil characteristics, species interactions, precipitation, photoperiod, etc.). Our study accounted for these factors using dendrochronological techniques to focus on the relationship between temperature and growth. We used two common gardens (established in 1967) containing 41 tamarack genotypes from a broad latitudinal range (Ohio to northern Michigan). Source climate data was used to compare how adaptation to historical climate conditions influenced growth and survival in the new colder or warmer sites. We measured survival rate and diameter breast height (DBH), estimated ice damage and insect herbivory, and cored all trees. The genotypes from warmer environments experienced a greater increase in survival and DBH than genotypes collected from cooler, northern habitats, especially at the southern transplant site. All genotypes showed greater growth at the northern site, suggesting that warming may be detrimental to tamarack growth. Genotypes from northern environments showed greater ice damage induced mortality at the southern transplant site. Together, these results suggest global warming will likely have negative impacts on tamarack populations.

PROBING ENZYME-SUBSTRATE INTERACTION OF AN INTRAMEMBRANE-CLEAVING PROTEASE

Paul Luethy

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 can now be placed in SpoIVFB at residues believed to be close to Pro- σ^K during cleavage. A single cysteine can also be placed into Pro- σ^K , allowing us to study enzyme/substrate interactions through cross-linking experiments.

COMPARING THE USABILITY OF ANALOG VS DIGITAL SPEEDOMETERS

Nicole Lysak

Mentor(s): Constantinos Coursaris (Telecom, Information Studies & Media)

Typically, when someone pictures a speedometer they imagine a semi-circular dial of various speeds measured in miles per hour with an orange needle that indicates the speed they are currently traveling. Throughout history, this "analog" speedometer format has proven to be both efficient and aesthetically pleasing. Then why are some of the new, most innovative automobiles, particularly the Toyota Prius, incorporating a "digital" speedometer into their designs? Is it only to enhance the appearance of the fancy and modern dashboard interface, or are there underlying advantages to a digital speedometer that have been previously overlooked? With this study, my intention is to answer these questions and compare the usability of analog speedometers versus digital speedometers. I hope to identify the differences, if any, between the two formats in order to observe Perceived Ease of Use, which will eventually lead to Perceived Safety. The determining factors of the study are Comfort and Speed Awareness, which will be measured by surveys and video recorded data of the driving participants in a natural setting. The necessity of safety and awareness on the road combined with curiosity for recent automobile designs are ultimately what drove my interest in this study. It is possible that the way in which a driver reads his/her traveling speed affects comfort, awareness, and overall safety while driving. This study will be helpful in perfecting the automobile for the safest possible transportation.

FROM GENERATION GI TO GENERATION Y: THE NEEDS OF RELATIVE CAREGIVERS BY AGE

Julia Lyskawa

Mentor(s): Danielle Rudder (School of Social Work)

Although the concept of kinship families has existed in various cultures for centuries, only recently has the kinship family become an important part of the child welfare system. Relative caregivers are increasingly relied upon as a permanency option for children, yet little is known about this population. The Kinship Caregiving Survey was a cross-sectional, mixed methods survey that was distributed to 350 caregivers to learn about the social support, community resources, and financial resources available to them, along with the outcomes for their children. Of the 227 completed surveys, it was revealed that the age of caregivers ranged from 25-years-old to 99-years-old. This presentation will demonstrate the similarities and differences between the youngest and the oldest cohort of caregivers in terms of demographics, emotional and physical well-being, and levels of financial and social support. These findings are important because not only do they describe the distinction between young and old caregivers, but they also provide insight into the resources that kinship families need and the direction for future policy recommendations. Kinship policy is not yet uniform across this country, but it is becoming clear that placing children with their relatives removes stress from the child welfare system and that kinship placement has many benefits for the child. If policy continues to follow this trend, it is necessary to know what needs these caregivers must have fulfilled in order to successfully raise these children.

IDENTIFICATION OF MIXED-SPECIES BLOODMEALS IN MOSQUITOES VIA BACTERIAL CLONING

Megan Machiniak

Mentor(s): Edward Walker (Microbiology)

Knowledge of feeding patterns of mosquito species is essential for understanding of the transmission of West Nile virus. Using DNA extraction, Polymerase Chain Reaction (PCR), and sequencing techniques, DNA sequences from hosts can be isolated and identified from the bloodmeals found in the abdomens of fed mosquitoes. However, in cases where the mosquito has fed on multiple hosts of different species, the usual techniques cannot isolate and identify more than one sequence, and thus cannot identify the presence of multiple species. The purpose of this study was to create an efficient protocol for cloning, sequencing, and identification of the DNA sequences in mixed-species bloodmeals. This study utilized the pGEM-T Easy Vector system and competent *Escherichia coli* cells for use in the transformation of the bacteria with the PCR products isolated from the bloodmeals. Selection for transformed cells was done via S-Gal plates with ampicillin. In addition to the development of the protocol, an experiment using mixed whole human and whole house sparrow blood in different ratios was conducted. Typical DNA extraction and PCR techniques were used, and the PCR products were utilized with the newly developed cloning protocol. The results of this experiment are forthcoming.

THE EFFECTS OF DILUTE ACID TREATMENT ON COMPONENTS OF MANURE FIBER

James MacLellan

Mentor(s): Wei Liao (Biosystems Engineering)

Dairy manure contains cellulose, hemicellulose, lignin, and crude protein. It represents a large potential source of carbohydrates and proteins that can be converted into useable intermediates of mono-sugars and amino acids for production of various bioenergy/chemicals. Dilute acid pretreatment as one of typical processes is used to pretreat lignocellulosic materials to accumulate cellulose for further enzymatic hydrolysis of mono-sugar production. The objectives of this study is to statistically study the effects of reaction conditions of temperature, acid concentration, and reaction time on manure components of cellulose, hemicellulose, and lignin during dilute acid treatment of dairy manure; and to further optimize the accumulation of cellulose for later enzymatic conversion to glucose. A completely random design will be adopted to investigate the effects of the reaction conditions on each individual component and later followed by a pair-wise comparison to obtain the optimal conditions for cellulose accumulation.

EXPRESSION, PURIFICATION, AND ACTIVITY STUDIES OF ACTIVATION-INDUCED DEAMINASE (AID) PROTEIN

Alvin Makohon-Moore, Paul Harris

Mentor(s): Dennis Arvidson (Microbiology), Kefei Yu (Microbiology)

Activation-Induced Deaminase (AID) protein functions in class switch recombination and somatic hypermutation in mammalian cells. The AID protein deaminates cytidine sites in single stranded DNA. We designed and constructed an expression plasmid that encodes AID as a recombinant fusion protein. Our construct includes an N-terminal maltose binding protein as a solubility and expression tag followed by a hexa-histidine tag to allow affinity purification linked via a TEV cleavage site to AID. This construct will allow us to express the fusion protein at adequate levels, to purify the fusion protein using NiNTA affinity chromatography, to cleave the fusion protein with TEV protease releasing native AID, and to purify the native AID away from both the his-tagged TEV protease as well as the cleaved N-terminal tag using a second NiNTA affinity chromatography step. In previous work with recombinant AID protein, it was found that amino acids remaining after tag cleavage altered AID function. As our new construct will allow us to produce AID protein with no non-native amino acids we expect that it will have full wild type function.

UNDERSTANDING KEY COMPONENTS OF NUTRITION ENVIRONMENTS, POLICIES AND PROGRAMS IN SCHOOLS AND THEIR IMPACT ON STUDENTS DIETS

Ellen Mang, Caitlin Fisher, Stephanie Gorte, Leah Simpson, Meaghan Snowdin

Mentor(s): Katherine Alaimo (Food Science and Human Nutrition), Richard Miles (Food Science and Human Nutrition), Jennifer Mosack (Food Science and Human Nutrition)

Nutrition plays an important role in the healthy development of children. Schools have the opportunity to make a large impact on children's diets. 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. One of the SNAK interventions involves completing the Healthy School Action Tool (HSAT) and implementing positive policy and environmental changes. The HSAT, an online self-assessment tool, is available to assist all Michigan schools in creating a healthier environment for their students. Baseline and follow-up data were collected to evaluate this intervention. School wellness policies were evaluated to determine their quality and strength. Foods offered and purchased in the cafeterias were reported along with foods available in vending machines. These foods were assessed for nutrient composition. A food frequency questionnaire was used to gather information on all foods consumed by 7th grade students during a one-week time period. Results from this study will provide a better understanding of overall nutrition in schools, aid in determining the effectiveness of the HSAT, and assist in designing future interventions to improve food and beverage options available to students in middle schools.

LOW-MAINTENANCE ROADSIDE ALTERNATIVES FOR THE PROMOTION OF ECOLOGICAL RESPONSIBILITY

Egypt Mapes, Mike Prohaska, Emily Reed

Mentor(s): Terry Link (Campus Sustainability), Steven Safferman (Biosystems & Agricultural Engineering)

On the Michigan State University Campus, there has been a widespread movement to promote sustainability. However, roadsides are a widely untouched area for the potential reduction of resource use, carbon output, and the general promotion of ecological responsibility. Roadsides represent about one percent of the total land area in the U.S. (Forman, et al). When planted with the traditional plantings of turf grasses, this area utilizes a large amount of resources while often having little aesthetic attractiveness. Through our research, we plan on addressing alternatives to these traditional turf grass plantings. We will create a landscaping plan for Service Drive from Harrison Rd to Hagadorn Rd which reduces maintenance and resource use, promotes the presence of wildlife (at a safe level), improves the ecological health of the area, and is aesthetically pleasing. Our research focuses on native species which are well adapted to local climates and thus require little human maintenance. This research, although specific to Service Drive, will be widely applicable to other roadsides across MSU campus and the state of Michigan.

DOPAMINERGIC INPUTS TO THE MEDIAL PREOPTIC AREA OF ADULT, MALE HAMSTERS

Angela Marchin

Mentor(s): Susan Ravizza (Psychology), Cheryl Sisk (Neuroscience, Psychology)

The medial preoptic area (MPOA) is associated with the ability of males to successfully mate. Lesions of this area severely inhibit male sexual behavior. Further, a dopamine surge in the MPOA after exposure to a female or her pheromones is correlated with the male's ability to copulate. However, female pheromones are unable to elicit dopamine release in the MPOA in prepubertal males. Determining which population(s) of dopaminergic cell bodies project to the MPOA in the hamster will complement what we know about these pathways in rats, and will reveal areas in hamsters that may be involved in the pubertal maturation of reproductive behavior. In this experiment adult, male hamsters received unilateral iontophoretic injections of the retrograde tracer fluorogold into the medial preoptic area. One week later, brain tissue was collected for double-label immunocytochemistry to determine the location of dopaminergic cell bodies that contain fluorogold.

GROWTH, DIFFERENTIATION, AND PERSISTENCE OF BACTERIA PHOTORHABDUS LUMINESCENS IN THE NEMATODE HETERBDITIS BACTERIOPHORA

Alexander Martin

Mentor(s): Todd Ciche (Microbiology and Molecular Genetics)

In nature, the symbiotic relationship between *H. bacteriophora* and *Photorhabdus* is vital for the survival of each organism. This symbiosis is achieved through a series of sophisticated bacterial and nematode life cycle events, which includes formation of a bacterial biofilm in the rectal gland cells of the worm. The purpose of this research was to investigate the adhesion of bacteria to the biofilm in the worm intestine and quantitate the number of

transient and biofilm bacteria. The bacteria were labeled with GFP and dsRED fluorescent proteins for easy visualization inside the worm under a fluorescent microscope. Worm infective juveniles were fed on lawns of bacteria labeled with GFP for 12, 24, 36, and 48 hours, then transferred to the lawns of bacteria labeled with dsRED for 4 hours. This resulted in biofilm bacteria labeled with GFP and transient bacteria labeled with dsRED. We observed that approximately 90 to 110 bacteria constitute the biofilm in the rectal gland cells of the nematode. Curiously, most of the bacteria were small colony variants (SCV), whereas the transients were normal wild type big cells (WT), indicating that bacterial phenotypic switching or selection of SCV by worm might be important for biofilm formation. The SCV formed sectorized colonies on LBP plates, and reverted back to WT in high frequency upon re-streaking. The biofilm bacteria subsequently invade the worm and colonize the IJs, an average of 170 bacteria recovered were WT. These findings are important to understanding the symbiosis between the worm and the bacteria.

STEEL: HOT METAL, COLD REALITY

Elizabeth Marzotto, Alexandra Ghaly, Julie Mianeki, Amanda Peterka

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 numerous photographers, allowing steel's prominence to live on through these images. The planned exhibition, Steel: Hot Metal, Cold Reality, 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 and an extensive audio, visual and Web collection. As the project has taken shape, our responsibilities have undergone a series of parallel transformations. While we were previously involved in documentary and online research, bibliographic and database development, and organizational tasks, our team of research assistants is increasingly involved in the selection process for project material to be included in the exhibition and books. This process involves funneling a massive amount of material focused on cultural, artistic, historical and international themes into a meticulously defined, curatorial work. Our presentation will examine several photographs, exploring the many interesting dimensions of the research and selection process through which they were chosen for exhibition.

SPIDER SILK - FIBER OF THE FUTURE

Jon Massie

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

It is remarkable that a creature as tiny as spider can produce such an amazing fiber as spider silk. Spider silk is an intriguing substance, as it is not only light weight, but has strength comparable to that of steel. What gives spider silk these unique qualities? How can knowledge of these qualities be implemented into human fiber production? These questions and more are explored in this project, "Spider Silk-Fiber of the Future".

EFFECT OF MUTATIONS AT PUTATIVE UBIQUITINYLATION SITES ON TRANSCRIPTIONAL ACTIVATION BY THE VP16 PROTEIN OF HERPES SIMPLEX VIRUS

Justyne Matheny

Mentor(s): Steven Triezenberg (Biochemistry and Molecular Biology)

During infection by Herpes Simplex Virus (HSV-1), viral immediate early (IE) gene transcription is activated by the virion protein VP16. Previous studies have shown that activator ubiquitinylation may recruit the 19S subunit of the proteasome to promoters, where the proteasome may trigger escape of RNA polymerase II from the promoter into elongation. In addition, poly-ubiquitinylation serves as a signal for protein degradation by the proteasome. Taken in combination, these two functions of ubiquitinylation suggest that a more active, ubiquitinylated, activator will have decreased stability. My hypothesis is that the activation ability of VP16 in HSV-1 infection is dependent on its ubiquitinylation state. Ubiquitinylation occurs only on primary amines, at lysine residues or at the N-terminus. To address the dependency of VP16 activity on ubiquitin, the VP16 gene was mutated to replace the four lysine residues, K29, K103, K343, and K370, with arginine residues, both individually and collectively. The relative transcriptional activation capabilities of each mutant were assessed using luciferase assays, and western blots were used to compare amounts of VP16 present in each sample. Luciferase assays showed that there was no significant difference between wild-type (WT) VP16 transcriptional activation and transcriptional activation by the eight mutants. Western blotting revealed no consistent difference in amounts of VP16 present in each sample, WT or the mutants. Based on these results I conclude that lysine ubiquitinylation is not important for VP16 transcriptional activation.

PHYSICAL ACTIVITY DURING PREGNANCY AND OFFSPRING SIZE (PAPOS): BODY COMPOSITION AT 18-24 MONTHS

Kelly Mattran

Mentor(s): Lanay Mudd (Kinesiology)

Physical activity (PA) during pregnancy appears to normalize birth weight; however, effects on toddler size and body composition are unknown. Objective: To determine associations between trimester-specific PA during pregnancy and offspring size at 18-24 months. Methods: Women (n=25) were recruited from clinics in Grand Rapids, MI while pregnant in 2006 and re-contacted in fall 2008. Women recalled type, duration, and frequency of leisure-time PA during each trimester, rated their toddler's current PA level, and reported demographics. Height, weight, and % fat were measured, and body mass index (BMI) and weight-for-height z-scores (WHZ) were calculated for mothers and toddlers, respectively. Spearman correlations and Mann-Whitney U-tests evaluated associations between PA and offspring size. Results: Median toddler WHZ was 0.6 (range -0.6 to 2.5) and % fat was 18.2 (13.3 to 23.6). First trimester PA was positively correlated to toddler height ($r_s=0.44$, $p=0.03$) while third trimester PA was negatively correlated to toddler weight ($r_s=-0.42$, $p=0.04$) and WHZ ($r_s=-0.42$, $p=0.04$). Maternal PA and BMI were unrelated to toddler % fat. Males and offspring of low income women had significantly higher WHZ ($p<0.05$). Toddlers rated as more active than their peers had a trend towards lower % fat ($p=0.053$). Conclusions: PA later in pregnancy may have a greater impact on toddler body composition because developmentally, the 3rd trimester corresponds to the greatest rates of fetal weight gain. Further study is needed to investigate trimester-specific influences of PA for future recommendations to maximize maternal and offspring health benefits.

SYMPTOMS OF PTSD AND WORKING MEMORY CAPACITY

Rebecca Mayer

Mentor(s): Susan Ravizza (Psychology)

Post-Traumatic Stress Disorder can have devastating effects on the individual as well as others around them. With the prospect of returning soldiers from the Iraq war in 2010, it is important to understand the effects of PTSD on cognitive functioning as this may affect soldiers' ability to become re-integrated into society. Even though many individuals will never understand the situations that a soldier has been in, there are some people that have experienced stressful life events that may have produced similar feelings. Given that those with PTSD have intrusive thoughts related to their trauma, we assessed

whether healthy participants who experience a high degree of intruding stressful or anxious thoughts also have problems inhibiting all types of information. In this study we tested whether the severity of symptoms of PTSD in a healthy population would be related to lower working memory capacity and difficulty inhibiting irrelevant information. We also sought to determine if there was a correlation between specific symptoms of PTSD (i.e. hyperarousal, avoidance, and intrusion) and working memory performance. We predicted that individuals with higher levels of intrusive symptoms would experience greater difficulty in working memory conditions that involve the suppression of irrelevant information than those with fewer intrusive symptoms.

CHLOROPLAST DNA MUTATIONS AS A GENETIC INDICATOR OF OXIDATIVE DAMAGE IN CHLAMYDOMONAS REINHARDTII

Ryan Mayle

Mentor(s): Barb Sears (Plant Biology)

Although photosynthesis is essential for harvesting the sun's energy, the process generates reactive oxygen species (ROS) at the chloroplast thylakoid membrane. Because ROS can chemically alter proteins, lipids, and nucleic acids, processes exist to rapidly divert or detoxify ROS within the chloroplast. Lipid-soluble antioxidants and nonphotochemical quenching have been shown to protect the integrity of the photosynthetic apparatus, but it is unknown if they protect chloroplast DNA. This study tests the hypothesis that those agents protect both the photosynthetic complexes and chloroplast DNA. Two *Chlamydomonas* lines enable this study: one strain is a light-sensitive double mutant, which is deficient in specific antioxidants and in non-photochemical quenching. A companion strain expresses high levels of the antioxidant tocopherol within the chloroplast of the double mutant. If ROS generated by photosynthesis damages DNA, the first strain should have a high level of spontaneous mutation compared to wild type, and the second strain should have an intermediate level of mutation. These predictions were supported by our experiments, and furthermore, growth of wild-type cells in the presence of the photosensitizer methyl viologen results in elevated levels of chloroplast DNA mutation. In conclusion, our studies have shown that chloroplast DNA is susceptible to photooxidative damage and that protection is conferred by at least two pathways that act to protect the photosynthetic apparatus.

THE ROLE OF THE INPUT IN FIRST LANGUAGE ACQUISITION: THE CASE OF MEXICAN AND CHILEAN SPANISH

Amanda Mazzio, Kelsey Holsinger

Mentor(s): Cristina Schmitt (Linguistics & Germ, Slavic, Asian & Afr Lang)

We examine children (ages 2-5)'s production of plural morphology in two dialects of Spanish, which vary in their realization of plural morphology. Plural morphology in Mexico City Spanish is marked with [s], while in Chilean Spanish, the plural morphology can be realized as [s], [h] or it can be omitted. In other words, in Chilean Spanish sometimes the singular forms are identical to the intended forms. We hypothesize that there is a correlation between the production of plural marking and the acquisition of plural morphology. In this experiment we report the results from an elicitation task comprised of 20-25 real and nonsense words. The children (ages 2-5) were shown pictures of a single item and were told "Este/a es un/a..." (This is a...) and then were shown a plural set of the same items and were asked to complete the sentence "Ahora hay dos..." (Now there are two...) The results were coded [s], [h] for an aspirated form, and \emptyset for an unmarked plural. The children's answers were recorded and coded by two independent coders so that the data could be checked for reliability. The results are analyzed based on the age and dialect of the children to search for common trends in the acquisition of the plural markers. The results will contribute to our understanding of role of the input in language acquisition.

EXPRESSION OF SMALL BREAST EPITHELIAL MUCIN (SBEM), A POSSIBLE BREAST CANCER BIOMARKER

Mary McCarthy

Mentor(s): Richard Miksicek (Physiology)

Recent research has identified several genes whose expression patterns make them potentially valuable biomarkers for the diagnosis of breast cancer. Among these is Mucin-Like 1/Small Breast Epithelial Mucin (MUCL1/SBEM), a gene of unknown function whose expression is restricted primarily to human mammary epithelial cells. SBEM expression was strongly correlated with that of an adjacent gene, dermicidin (DCD) and secretoglobin 2A2 (SCGB2A2, also known as mammaglobin-1), another breast-specific gene, indicating that these three genes could serve as useful markers to aid in the detection of human breast tumors. To explore its potential for use as a breast cancer biomarker, it is necessary to develop immunological reagents to measure the SBEM protein in cells, tissue or tumor specimens, serum samples, or other biological fluids. The SBEM peptide is relatively small (71 amino acids), however, sequence analysis predicts post-translational modification by glycosylation of multiple threonine residues. 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 was generated in order to facilitate 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.

POPULATION STRUCTURE OF CHERRY FRUIT FLY (RHAGOLETIS CINGULATA) IN MANAGED, UNMANAGED, AND NATURAL HABITATS

Robert McClowry

Mentor(s): James Smith (Lyman Briggs College, Entomology, Zoology)

After Michigan cherry growers harvest their cherries each summer, there is often a high infestation rate with *Rhagoletis cingulata* (the cherry fruit fly; CFF) of the cherries that remain in the orchards. The origin of these flies is unknown and in this project we are working to find out if these post-harvest CFF originated in the growers' managed orchards themselves, or from nearby unmanaged orchards, or from native black cherry trees. Our approach is to test to see if CFF populations that come from different host plant habitats (managed tart cherry orchards, unmanaged tart cherry orchards, and wild black cherries) have diverged genetically and are subdivided across the three different habitats. Flies were collected from each of the three habitat types at two geographically separated localities in the lower peninsula of Michigan. DNA was isolated from individual flies and alleles at three microsatellite loci were amplified using the polymerase chain reaction with locus-specific primers. Alleles at these microsatellite loci were scored and then analyzed using the computer programs Microsat Analyzer (MSA) and Structure to test for population subdivision. The data obtained are being used to determine whether or not these flies have diverged into subgroups across the three different habitats, and which of the three habitats is most likely the source of CFF involved in the post-harvest infestations.

GEOGRAPHIC RACIAL EQUALITY IN THE METROPOLITAN CHICAGO AREA BETWEEN ASIANS AND WHITES

Amanda McCormick

Mentor(s): Joe Darden (Geography)

This study differs from similar previous studies because it looks at equality rather than inequality for a minority group. This paper investigates the extent to which geographic racial equality between Asians and Whites exists in Metropolitan Chicago, IL based on income, occupational status, educational

attainment, and the level of residential segregation. The hypothesis is that at least 5% of the incorporated municipalities in the study area have achieved geographic racial equality. The data were obtained from the United States Bureau of the Census Summary Tape Files 3 and 4 for 2000. The index of dissimilarity was used to determine the extent of residential segregation between Asians and Whites. Geographic racial equality was found in 24 of the 81 incorporated municipalities in the study area. Thus the hypothesis was accepted.

COMFORT LEVEL AND THEIR EFFECTS ON THE SAFE USE OF AUTOMOBILES

Brittany McCormick

Mentor(s): Constantinos Coursaris (Telecom, Information Studies & Media)

The proposed study is to see if the comfort level of a driver affects how safe they operate a vehicle. This is based off of the idea that some vehicles include heating/cooling devices in their seats that can be set at very high or very low temperatures. The extremity of these temperatures could affect the way a driver operates their vehicle. Through the study, it is going to be tested to see if the comfort level of a driver is affected by the temperature of the seat they are sitting in. This will see if the temperature of the seat has an effect on whether the driver can operate a vehicle in a safe manner or not. If the driver has minimal distraction from the temperature of the seat, it is hypothesized that they will have a high comfort level. This study can help determine whether the usability of seats in vehicles affects safety. The comfort level of the driver in the experiment will be analyzed by the driver filling out a post-experiment questionnaire. The drivers will be surveyed at the end of each of their test runs with the same survey. The comfort level and how they reacted to the changes in temperatures will both be measured. This study is related to usability by it tests to see if the seats in vehicles are being used to their full potential. If seats can be improved to help drivers operate their vehicles more safely, than they should be enhanced.

FUNCTIONAL TRAITS UNDERLYING MATING SYSTEM EVOLUTION IN THE WILD RELATIVES OF RICE

Martha McCoy

Mentor(s): Douglas Schemske (Plant Biology)

Plants have diverse mating system strategies that allow them to adapt to varying environments. Specifically, plants differ in degree of self-fertilization (selfing) vs. cross-fertilization (outcrossing), a divergence that is correlated with life history and habitat. Despite this, little is known about the functional traits that contribute to mating system evolution in wind-pollinated plants such as rice. In this study, we identified several floral morphological characteristics that may contribute to the rates of maternal or paternal outcrossing in wild relatives of rice, *Oryza nivara* (primarily selfing) and *Oryza rufipogon* (largely outcrossing). Traits that seem to stand out include basal pore length and early dehiscence; our preliminary results revealed statistically significant differences in the means for these traits between *O. rufipogon* and *O. nivara*. The major goal of our present research is to identify the key functional traits that control outcrossing. We have created an F2 generation with segregating *O. rufipogon* and *O. nivara* traits, and we have measured these mating system traits for the 100 F2 plants. The next step is to measure the outcrossing rate of the F2s and correlate it with the F2 traits measurements using a multiple regression model. Other studies are underway to determine the occurrence of autogamy (self-pollination within the same flower) and geitonogamy (different flowers on the same plant pollinating each other) and to measure the paternal outcrossing rate. Overall, an understanding of functional traits underlying mating system divergence is important to the study of plant evolution and crop viability.

BIOGEOGRAPHIC ASSOCIATIONS OF SILURIAN BRYOZOAN GENERA IN NORTH AMERICA, BALTICA AND SIBERIA

Victoria McCoy

Mentor(s): Robert Anstey (Geological Sciences)

Silurian bryozoan faunas in North America, Baltica and Siberia belong to six geographic assemblages determined by Parsimony Analysis of Endemicity and Simpson's Index of Faunal Similarity of their generic compositions. In the Llandoveryan, the Brassfield assemblage occupies most of the three continents except for a smaller region occupied by a Mongolian assemblage. In the Wenlockian, the Brassfield and Mongolian assemblages both persist, but the former becomes restricted within Baltica. The Visby and Rochester Assemblages replace the Brassfield in North America, by processes involving both vicariance and geodispersal. In the Ludlovian/Pridolian, the Rochester assemblage persists in North America, and the Visby Assemblage is replaced in eastern North America and England by the Keyser assemblage. The Keyser includes endemics common to the Mongolian assemblage. A new Estonia-Ukraine assemblage replaces the Visby in Baltica. Both the Brassfield and the Mongolian assemblages have endemic associations completely congruent with their overall faunal composition. Incongruent Visby endemics are found in the Waldron fauna of Indiana and Tennessee, whose overall affinity is with the Rochester assemblage. Incongruent Rochester endemics are found in the Henryhouse fauna of Oklahoma, whose overall affinity is with the Keyser assemblage. Incongruent Estonia-Ukraine endemics also are found in the Malinovetskie fauna of Podolia, whose overall affinity is with the Keyser assemblage. All of these disjunct associations can be attributed to limited dispersal of otherwise endemic genera.

THE IMPACT OF SINES INSERTED IN 3 PRIME UTRS ON MRNA STABILITY

Andrea McCurry

Mentor(s): Patrick Venta (Microbiology & Molecular Genetics)

Short interspersed nuclear elements litter eukaryotic genomes. However, the impact of SINEs upon gene function is poorly understood. For example, it is unknown if SINEs inserted into the 3' untranslated regions of messenger RNAs have an impact upon the stability of those mRNAs. We identified four canine genes, KLHDC5, HRSP12, DMD, and DRD2, which have SINE insertion polymorphisms in their 3' untranslated regions. We hypothesize that alleles containing these SINEs will be less stable than alleles not containing the SINEs. In order to test this hypothesis, it is necessary to have an RNA sample from a dog that is heterozygous for both the SINE insertion and for a SNP elsewhere in the mRNA that will allow quantification of the two respective alleles. Finding a doubly heterozygous dog is dependant upon reasonable allele frequencies for both polymorphisms. The KLHDC5 gene was found to have considerable variation in four breeds, showing minor allele frequencies as follows: Beagle, 0.30; Cairn Terrier, 0.38; German Shorthaired Pointer, 0.33; and Thai Ridgeback, 0.50. PCR primer sets have been developed to amplify all exons of the KLHDC5 gene which are likely to contain at least one polymorphic SNP. Once double heterozygosity is established, quantification of the mRNA produced from the two alleles will allow us to test the hypothesis that SINE insertions have an impact upon mRNA stability. Variations in the other three genes will be used to confirm the results found for the KLHDC5 gene.

THE SELECTION OR EXCLUSION OF THE GOLDEN COMPASS BOOKS IN SECONDARY ENGLISH CLASSES

Jessica McLean

Mentor(s): Reade Dornan (English)

Phillip Pullman's book trilogy, His Dark Materials (The Golden Compass, The Subtle Knife and The Amber Spyglass) has stirred up much controversy as a young adult series containing overarching adult themes. This project will look at the reception of these books by educators and authorities within schools and the decision-making process behind using them in curriculum. It will also question whether these books are valued by their literary merit (in the tie

between these books and William Blake's work) or by the culture within the community and opinions of parents. These findings will coincide with a portion of Dr. Reade Dornan's book, *A Guarded Education: Protecting Innocence in Adolescent Literature*, which discusses morality in education. The methodologies used in this research will range from surveying and interviewing principals, teachers and school media specialists regarding both their perceptions and receptions of this series as well as the children they interact with. We will compare book reviews from different world perspectives and examine literary merits of the books as well. We expect to confirm that administration and educators will hold the contentious issues of religion, authority, sexuality and gender as more important in deciding to bring text into a classroom than the literary merits of the work.

USABILITY AND USE OF RAILROAD SYSTEMS

Chris McMahon

Mentor(s): Constantinos Coursaris (Telecom, Information Studies & Media, Accessibility & Usability)

Research Questions: 1) Are railroads a legitimate alternative to other forms of transportation, given the current circumstances?; 2) If railroads are a viable option, will there be a desire to use them? Hypothesis: 1) My model currently shows a fairly simple synopsis (though not inaccurate) of the situation, and it will obviously become more diverse as my research progresses. However, I feel that my research will show that railroads will be viable. As Investment and Demand grow, the Infrastructure will become strong enough to create a situation that makes trains usable; 2) As both individuals and companies see costs, comfort and travel time become more favorable, the desire to Use railroads will rise. I'm certain my research will uncover more factors in this as well. Outline: 1) Since this is partially an economic question, this part will likely require more, specialized research, along with primary research in talking to experts. We'd also supplement this with computer models, examining how modifications to the track layouts, number of stops, and number of cars effect the overall usability of the system; 2) Unlike the first part, this is very view oriented. It will likely require some surveying via questionnaire of the population in various areas, both close to and far from major railroads, to find out their views on railroad usability in real and hypothetical situations.

CONSUMER RESPONSE TO MOBILE ADVERTISING TARGETED BY LOCATION AND PROXIMITY

Chris McMahon, Sara Colunga-Santoyo, Sean Kristl, Brittany McCormick, Justin Wong

Mentor(s): Constantinos Coursaris (Telecom, Information Studies & Media, Accessibility & Usability)

In the United States, more than 267 million people use a mobile phone (Limbo 2008). An average of 40 percent recall receiving some form of advertisement on their mobile device (Limbo 2008). The market for mobile advertisement is on the rise Mobile advertising is based off of forming personal relationships between the companies and their consumers. One of the ways that companies attempt to form these relationships is by utilizing the Global Positioning System (GPS) to incorporate information about the customer's location into the advertisements. (Salo and Tahtinen 2005). The specific location of the consumers is taken into consideration and advertisements are targeted based on their location in relation to the establishment (Giaglis 2003). This study attempts to explore the boundaries of comfort in GPS and other tracking systems via the cell network to facilitate the awareness of an establishment through mobile advertising. We expect to find location-based targeting will increase the effectiveness of mobile advertising, up to a certain threshold. Past this threshold, the increased personalization in terms of location no longer increases the effective of the mobile advertisement, and begins to negatively impact the effectiveness of the advertisement. This study will be administered as a paper-based questionnaire. The convenient sample will consist of college undergraduates enrolled at Michigan State University. The survey aims to assess the level of comfort of individuals as they're exposed to mobile advertising targeted by GPS, and how proximity to a business affects this.

EVOLUTION FOR EVERYONE

Ellen Meeuwesen, Erin Campbell, Jeremy Davis, Brittany Diamantoni, Katie Guikema

Mentor(s): Danita Brandt (Geological Sciences), Dean Rehberger (Writing, Rhetoric, and American Culture)

Great strides have been made in the past fifty years in the field of accessibility for sight impaired individuals. Technology has improved the ability of society to allow people with limited vision to enjoy independence in life similar to their sighted counterparts. However, one imperative facet of the world that is not fully accessible to those who cannot see is museums, especially exhibits behind glass. Much of the information communicated by the Michigan State University Museum Evolution Hall is visual. The objective of our research is to rectify this situation and create an exhibit that is attainable to the sight impaired. Throughout the seminar, we were able to enrich our research by meeting with experts in the fields of accessibility and museum displays. The collaboration of our research and their suggestions has allowed us to find the most plausible and effective measures necessary to improve the Evolution Hall at Michigan State. Our goal is to renovate the exhibit, providing more tangible and tactile elements to expand the visitor's learning. We have created an interactive website to complement the Evolution Hall, which will allow the visitor to gain even more understanding about the subject matter and the exhibit itself. Through these exciting new enhancements to the MSU Museum, we believe that the Evolution Exhibit will be more accessible and enjoyable to all visitors.

SCANNING ELECTRON MICROSCOPE PLANT STRUCTURE AND FUNCTION IMAGES

Nicole Messenger

Mentor(s): Carl Boehlert (Engineering)

The purpose of my poster is to examine the key, over-looked components of a plant using a Scanning Election Microscope (SEM). Using SEM images I intend to relate the size of the plant part to its function. The most notable plant parts to be evaluated are the oil sacks of fragrance, the stomata, and trichomes. Relating the size of these tiny parts of the plant can better emphasize the role they play in maintaining a healthy plant. Using different plant specimens, I will obtain high magnification images using a SEM to explore their features and structures up close. This will help elucidate the key functions of the plants and how their size and structure allows for them to work efficiently.

COMPARISON OF ECONOMY IN OVER-GROUND VERSUS TREADMILL WALKING IN CHILDREN AND ADOLESCENTS

Daniel Miller

Mentor(s): Karin Pfeiffer (Kinesiology)

Researchers typically utilize treadmills in exercise studies involving children and adolescents for the sake of convenience; however, little research has been devoted to compare economy of over-ground versus treadmill locomotion in younger populations. The purpose of this study was to compare economy of children and adolescents during over-ground and treadmill walking. Participants included forty males (n=14) and females (n=26), age 6-16 years. Expired gases were collected breath by breath using a portable metabolic analyzer to estimate energy expenditure. Participants performed a brisk over-ground walk at a self selected pace for five minutes. Over-ground walking speed was calculated from the walking distance and lap times. The treadmill walk was then performed for five minutes at the same speed as the over-ground walk. Repeated measures ANOVA was used to examine differences between trials. A secondary analysis repeated the ANOVA and controlled for age. Initial results displayed a difference between over-ground

and treadmill economy (20.1 vs. 22.1 ml/kg/min, respectively; $p < 0.001$). However, after controlling for age, there was no longer a difference in economy. Results did not show a difference between over-ground and treadmill economy in children and adolescents for a brisk walk, which is consistent with adult literature. Based on these results, it is possible that clinicians and researchers may not need to worry about economy differences for over-ground versus treadmill walking at self selected speeds. However, more research with higher speeds and predetermined paces is necessary.

ANATOMY OF A GUITAR STRING

Derek Miller

Mentor(s): Carl Boehlert (ChEMS)

Something as simple as a guitar string can have many intricacies not visible to the naked eye. Using Scanning Electron Microscopy (SEM) and Energy Dispersive X-Ray Spectroscopy (EDS), these details are observed at high magnification. Three types of strings were studied, including a regular single wire metal string, a thicker string with another metal string coiled around it, and a coiled metal string with a nylon thread matrix running through the middle. Cross-sections and longitudinal faces were made visible and examined using the SEM. The cross-sections revealed a near perfect hexagonal shape of the inner wire of one coiled string and hundreds of nylon threads packed tightly into a matrix of the other. A longitudinal cross-section was also revealed to study the inner wire of the coiled string. EDS was used on each string to determine the various elemental compositions of the outer coils, inner wires, and inner threads. These results were then used to come to conclusions about why each string is made the way it is for its particular function.

NOVEL ELECTRICALLY ACTIVE POLYANILINE COATED MAGNETIC (EAPM) NANOPARTICLES FOR MAGNETIC CONCENTRATION OF BACTERIA

Hanna Miller

Mentor(s): Evangelyn Alocilja (Biosystem Engineering)

Novel electrically active polyaniline coated magnetic (EAPM) nanoparticles were tested for the capture of *B. anthracis* and *B. cereus* bacteria from different food matrices. The EAPM nanoparticles were first modified with antibodies specific for the antigen and then used to concentrate the antigen from different food samples. The procedure for biologically modifying the EAPM nanoparticles and capturing the pathogen was initially optimized by varying the incubation time, antibody concentration, and EAPM nanoparticle concentration. This optimized procedure was then used to find the capture efficiency of the EAPM nanoparticles in concentrating both pathogens from lettuce, whole milk, and milk samples with different fat content. Capture was achieved for concentrations of colony forming units as low as 10^4 CFU/ml for *B. anthracis* and 10^2 CFU/ml for *B. cereus* from the lettuce and milk samples. EAMP is showing to be a great alternative to commercially available expensive immune-magnetic beads.

PREVALENCE AND TRANSMISSION OF GROUP B STREPTOCOCCUS GBS IN FAMILIES LIVING ON FARMS AND THEIR FARM ANIMALS

Amber Million

Mentor(s): Dele Davies (Pediatrics and Human Development)

GBS, a leading cause of neonatal sepsis and meningitis, commonly colonizes pregnant women, non-pregnant adults and the elderly without causing symptoms. A few studies in young children indicate that colonization of GBS is rare, though the prevalence increases following the onset of sexual activity. Both intimate contact and fecal-oral transmission have been hypothesized to contribute to GBS colonization in adults, but the route of transmission to children has yet to be identified. Because GBS is also a common bovine pathogen, we hypothesized that individuals having regular contact with cattle may have higher rates of GBS colonization. In three Michigan counties between June and August 2008, stools were cultured for GBS from children, parents, guardians and cattle participating in 4H livestock projects. Each individual completed a questionnaire, self-collected a stool sample and obtained a stool sample from one or two farm animals to which they had the greatest personal contact. Stools were examined for GBS and all strains were characterized by multilocus sequence typing (MLST) and capsule (cps) genotyping.

ESOTERICISM, RELIGION, AND NATURE

Abigail Mistic

Mentor(s): Arthur Versluis (Religious Studies)

The editing process for the Association for the Study of Esotericism's forthcoming book, "Esotericism, Religion, and Nature."

CHILDREN LEARNING OJIBWE IN A SCHOOL SETTING

Autumn Mitchell, Carolyn Blanco

Mentor(s): Cristina Schmitt (Linguistics and Languages)

Language revitalization is an important issue in many indigenous American communities. Most Native American children do not acquire their ancestral languages in the home, which puts many indigenous languages in danger of extinction. In this study, we explore toddlers' learning of the grammatical morphology of Ojibwe (an endangered language indigenous to Michigan). In English, verbs agree with their subjects in plurality, but not animacy; in Ojibwe verbs agree with both. Previous work has shown that children can learn lexical items with very little exposure. We explore toddlers' ability to generalize grammatical features after a few minutes of exposure. We test native speakers of English in their ability to learn both number and animacy agreement in Ojibwe. Other researchers have used artificial languages to study acquisition in adults. However, few studies have examined the acquisition of grammatical morphology in toddlers. Our study differs in that we test younger children for two forms of grammatical agreement, one present in their native language and the other not present, enabling us to explore if generalizations are easier with previously known features. After a short practice session, children are tested for their acquisition of Ojibwe grammatical morphology. Three methods are used for testing: a picture-mapping task, an elicitation task and a grammaticality judgment task. The results of this study will contribute to our understanding of the importance of early exposure in acquiring second languages.

CABBAGE QUEST

Jonathan Moore

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

Cabbage Quest is an adventure game produced with the Unity 3d Game Engine. The game revolves around a manatee searching for cabbage to eat. The goal of the project was to develop a game that contains a survey of the many aspects of game development while utilizing the Unity engine as much as possible. Cabbage Quest is currently a single level in order to control the project's scope, but it is designed in such a way that the game could easily be expanded by using the assets created over the course of the project. The script assets, which were written in javascript, include a character controller, triggered cut-scenes, collectable items, camera controls, the manatee's shadow, and the user interface. Autodesk Maya was used to model the terrain, the manatee the player controls, cabbages, a motor boat, explosives, and several types of fish. These models were then textured with Adobe Photoshop, which was also used to create graphical components in the user interface. The gameplay has several core components: exploration, item collection and

delivery, and puzzle solving. Item collection in the first level requires obtaining cabbages to exchange for access to a new area. That new area requires the player solve a puzzle while being faced with the danger of losing. Most aspects of Cabbage Quest were developed by first researching manatees and then applying that research to the game.

CONTINUOUS WAVE AND PULSED EPR STUDIES OF TAU D

Shannon Morey

Mentor(s): John McCracken (Chemistry)

One and two-dimensional Electron Spin Echo Envelope Modulation (ESEEM) experiments are being used to study the coordination chemistry at the Fe(II) site of the non-heme Fe(II) hydroxylase, taurine/ α -ketoglutarate (α KG) dioxygenase (TauD). For this system the Fe(II)-NO derivatives of the enzyme are being studied. The NO serves as a surrogate for molecular oxygen and spin-couples to the integer spin Fe(II) to yield a $S=3/2$ paramagnetic center with an axial Electron Paramagnetic Resonance (EPR) spectrum characterized by g -perpendicular of 4.00 and a g -parallel of 2.00. One-dimensional ESEEM spectra taken across the EPR lineshape show modulations from ^{14}N and ^1H . At g equal to 4, the contributions from the coupled nuclei are overlapped, making it necessary to use the two dimensional, 4-pulse HYSCORE method to resolve the contributions from bound histidine nitrogens, coordinated H_2O , and histidyl coordination as co-substrates, α KG and taurine, were added to the enzyme. HYSCORE studies I performed produced different results than those performed by a previous MSU researcher whose experimental conditions were identical, but whose sample preparation differed. This work focused on identifying the disparities in the sample which produced the varying results and on the further study of the structure of the TauD enzyme using the HYSCORE and ESEEM techniques. The further investigations of TauD may provide important information on how active site protein residues work in concert with the Fe(II) center to catalyze the specific hydroxylation of taurine.

BOTANICAL INSECTICIDE PERSISTENCE STUDIES

Shannon Morey

Mentor(s): Dawn Reinhold (Biosystems & Agricultural Engineering)

A detailed background and literature review is being prepared for publication preceding an investigation of botanical insecticides in residential and agricultural areas around Michigan. The Estimation Program Interface (EPI) Suite software will be used to model the conditions under which samples are collected and to estimate the amount of various botanical insecticides in the air, water, sediment, and soil. These estimates will be compared to data I collect from local residential and agricultural properties. Liquid chromatography mass spectrometry and/or gas chromatography mass spectrometry will be used to measure the concentration of the botanical insecticides. A sample collection method is being developed based on methods used by the Environmental Protection Agency.

VIRAL CANCER PROTEIN MIDDLE T (MT) EFFECTS ON AP-1 AND ETS TRANSCRIPTION FACTORS IN TUMOR CELLS

Clifford Morgan

Mentor(s): Michele Fluck (Microbiology & Molecular Genetics)

Many factors contribute to the progression of cancer, one of which is the increased expression of certain genes. One such gene is mouse metalloprotease 1 (MMP-1), a collagenase that degrades extracellular membranes (ECMs), allowing a tumor to metastasize by releasing cancer cells from the tumor region. It is known that two transcription factors, AP-1 and Ets, which bind upstream of genes, are responsible for activating transcription of many progression-associated genes, including MMP-1. I will test whether Middle T (MT) from polyomavirus affects AP-1/Ets activity at the MMP-1 promoter using a luciferase reporter. I will test cells derived from a metastatic and a nonmetastatic mouse mammary gland tumors induced by wild type (WT) and respectively mutant MT. As a control I will use normal mammary cells. This will be done by creating four plasmid constructs, each having the AP-1/Ets sequence of MMP-1, upstream of a luciferase reporter gene. To test the individual and combined activity of AP-1/Ets factors I will make use of four combinations with WT and mutated binding sites. The different mutant versions will allow me to observe the independent activity of AP-1 and Ets. And the WT will reveal whether there is synergy between the two factors. The plasmids will be transfected into the tumor cell lines and assayed for luciferase activity, hence levels. Comparison between the metastatic and nonmetastatic cells, as well as the control normal cells will examine the correlation between tumor states and the activity of AP-1/Ets.

CHARACTERIZATION OF THE INTERACTIONS BETWEEN THE KLEBSIELLA AEROGENES UREASE ACCESSORY PROTEINS URE E AND URE G

Rachel Morr

Mentor(s): Robert Hausinger (Microbiology)

Urease, a nickel-containing enzyme that catalyses the decomposition of urea to carbamic acid and ammonia, has served as a model system for studying metallocenter assembly. Incorporation of nickel into the dinuclear active site of urease is achieved through the concerted effort of the UreD, UreE, UreF, and UreG accessory proteins. It is believed that UreE delivers nickel to UreG within a complex of the urease apoenzyme and the UreDFG molecular chaperone. A previous study focused on in vivo pull-down assays utilizing the convenient Strep-tag affinity purification system showed an interaction between the D80A site-directed mutant of Strep-tagged UreG (UreGstr) and UreE, but not other urease proteins. Here, similar pull-down experiments were performed which demonstrate that wild-type UreGstr forms a complex with UreE in vivo when these proteins are co-produced in *Escherichia coli*. This interaction is unaffected by the addition of 1 mM NiCl_2 to the growth medium, suggesting that complex formation is nickel independent. In contrast to these results, incubation of purified UreGstr and UreE yields a similar complex as that seen in the in vivo studies, but the inclusion of nickel appears to strengthen the interaction between the proteins as demonstrated by gel-filtration chromatography. Future work on this interaction could include the use of more sophisticated chromatographic techniques such as HPLC to probe for complex formation as well as investigating the effect of other metal ions and cofactors on the interaction between UreE and UreGstr.

UNCERTAINTY PRINCIPLES: THE CHANGING DYNAMICS OF NARRATIVE AND THEORY IN THE 21ST CENTURY

Seth Morton

Mentor(s): Judith Roof (English)

My work is interested in fiction and literary theory in the 21st century. While the challenges of late 20th century postmodern theory shifted the dynamics of thought and criticized many of the foundational beliefs surrounding notions of culture, many wonder what could continue this trajectory. In two separate academic conferences I have argued against the notion of "an end of literary history" by showing how both fiction and theory has responded to these aforementioned challenges in ways that both reinvigorate and ratify the value of such discourse. The first project considers the work of Percival Everett and examines how his novels trouble the dichotomy between "experimental" and "conventional" narrative. The later novels of Percival Everett take up the guise of the experimental in a way that forces us to question the logic of narrative and how it functions in relation to the production of meaning. I argue that rather than disrupt the conventional, these novels shift the dynamics of the experimental such that what we consider to be

conventional becomes the site of the experimental. The second takes of the theoretical impulse of "posthumanism" specifically in regard to how it challenges literary institutions that develop around an author like Franz Kafka. In a somewhat idiosyncratic reading of Kafka's *The Trial* along side David Willis' *Dorsality* I argue that the ways that 21st century literary theory reinscribe canonical writing reveal emerging 21st century values regarding culture, identity, and ethics.

MSU&U

Anson Mulville

Mentor(s): Bob Albers (Telecommunications)

EAST LANSING, Mich. — MSU & U — the Emmy award winning, news magazine student television program — continues to deliver segments about life, events and local hot spots at MSU, MSU & U is part of the MSU Telecasters, the university's student run television organization, and can be seen on campus Residence Hall Television (Channel 11) on Wednesdays, 4-5p.m., as well as on the Telecasters' Web site, www.telecasters.msu.edu or at the MSU & U Web site, www.msuandu.com. The show was created in 2005 by former student Brian Murray, now working for NFL Films, and has received honors from the Michigan chapter of the National Academy of Television Arts and Sciences and the Michigan Association of Broadcasters.

HABITAT QUALITY AFFECTS RATES OF GENE FLOW IN SOUTH-CENTRAL MICHIGAN WHITE-TAILED DEER

Brittany Murphy

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

Knowledge of the effects of land-cover and land-use on movements of individuals is essential to effectively manage wildlife populations such as the white-tailed deer (*Odocoileus virginianus*). Our objective was to explore relationships between measures of habitat suitability (i.e. the ability of deer to disperse through a region) and surrogate measures of dispersal provided by estimates of degree of genetic differentiation between sampling groups. Habitat suitability was estimated using the presence of various vegetative cover types and presence of potential barriers such as roads. Samples from free-ranging deer harvested across south-central Michigan (N=305) were collected during 1998- 2000 and genotyped using 7 microsatellite loci. Statistical measures describing the degree of genetic differentiation (F_{st}) among the deer throughout the area of study were estimated as a function of straight-line distance and along paths of 'least cost' given estimated habitat suitability. Deer from south-central Michigan were not one inter-breeding group. Rather, inter-group genetic variance increased with increasing distance. Deer inhabiting areas of lowest and highest habitat quality were found to be less genetically differentiated, implying higher levels of movement, than deer inhabiting areas of intermediate habitat quality. Information regarding the degree of movements for economically important animals like deer is important for management purposes because it allows predictions of future abundance and distribution. Such predictive power will help to anticipate and minimize human-wildlife conflict. Further, because movements facilitate the spread of zoonotic disease, the ability to predict habitat and land-use types that affects movements will help development of targeted, proactive disease controls.

COMPARING ADULT SPEECH AND CHILD SPEECH IN TWO DIALECTS OF SPANISH

Elizabeth Murphy

Mentor(s): Cristina Schmitt (Linguistics)

In this paper we ask to what extent differences in the input affect children's paths to their adult grammatical representations. The empirical domain is the acquisition of plural morphology in Spanish, more specifically Chilean Spanish and Mexico City Spanish. These dialects differ in the overt realization of plural morphology. While in Mexico City Spanish plural morphology is always overtly realized, in Chilean Spanish there is a substantial amount of socio-linguistic variation in the production of plural morphology, due to a well-known lenition process (common in many dialects of Spanish) that affects all syllable-final /s/, reducing [s] to a simple aspiration [h] and sometimes to zero (\emptyset). The amount of zero's correlate with social class and creates more ambiguity in the input. In this paper we ask how unreliable and ambiguous input affects the production of plural morphology. Previous work has suggested that while Mexican children produce plural morphology in adult-like ways by age 4, middle class Chilean children over use the plural morphology by age 4 and working class Chilean children under-use plural morphology by age 4 when compared to adults of the same group. In this paper we compare two types of adult speech (adult directed speech and child directed speech) with the speech of Chilean and Mexican children (working class and middle class) in order to determine whether children match the plural frequencies of adults, overuse it or underuse it.

REGIME CHANGE IN TRIPOLI

Matthew Murray

Mentor(s): Emine Evered (History)

From 1801 to 1805, the United States fought a war in the Mediterranean and in the Sahara with Tripoli, an autonomous regency of the Ottoman Empire. Corsairs operating from the port of Tripoli had declared war on American shipping and imperiled commercial interests in the region. The Jefferson administration responded by attempting to change the Tripolitan state's complete approach to international relations, from a traditional Ottoman style to a modern, formal European approach, in order to protect U.S. trade abroad. The U.S. pursued this agenda through an aggressive naval campaign, including bombardment of the city, a covert attempt to lead a coup d'état within Tripoli, and secret negotiations that resulted in abandoning allies. My paper will demonstrate how in the First Barbary War, the United States used imperialist methods in an attempt to impose a European-origin, capitalist, sovereign state system on Tripoli by force. This is part of a broader trend in world history and has implications for American, Middle Eastern, and economic histories.

A STUDY OF LETTER NAME KNOWLEDGE

Kayla Musielak, Jessica Burdick

Mentor(s): Ryan Bowles (Psychology), Lori Skibbe (Family & Child Ecology)

Knowledge of letter names is important in the acquisition of literacy skills and in predicting later reading achievements. Recent research suggests that preschoolers' knowledge of uppercase letter names influences their knowledge of lowercase letter names. That is, they transfer their knowledge of uppercase letters to lowercase letters. In our study of 84 preschool children from the MSU Child Development Laboratories, we looked at the transfer of letter name knowledge (LNK) and the influence of age, social skills, and household income on this transfer. Using a linear regression, we analyzed the scores of children's uppercase LNK and lowercase LNK at two time points and found strong transfer effects, suggesting that for every uppercase letter name they know, it is predicted that they will know .81 additional lowercase letter names three months later. We found no significant effect of age, social skills, or household income on the transfer of LNK. This may suggest that the transfer of uppercase LNK to lowercase LNK is an important aspect of letter learning for all children.

THE IMPACT OF PHOTO-OXIDATION ON CHLOROPLAST DNA: MUTATIONAL LESIONS AND RECOMBINATIONAL REPAIR

Ashita Nagori, Raetz Kevin

Mentor(s): Barbara Sears (Plant Biology)

Photosynthetic organisms generate several reactive oxygen species (ROS) as byproducts of photosynthesis. In theory, ROS can interact with lipids and proteins, causing oxidative damage to the chloroplast. 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 grew the unicellular green alga *Chlamydomonas reinhardtii* in the presence of Rose Bengal, which generates singlet oxygen in the presence of light, and is known to cause damage to the photosynthetic apparatus. We sought to determine the sensitivity of the cpDNA to this ROS insult by plating the cells on the antibiotic spectinomycin, which targets the chloroplast ribosome. Mutations to spectinomycin-resistance are due to base substitutions in the 16S rRNA gene, which is encoded in the cpDNA. The frequency of mutation to spectinomycin resistance increased when cells were exposed to higher concentrations of Rose Bengal, allowing us to conclude that exposure to singlet oxygen damages cpDNA. Following these results, we sought to explore whether recombinational repair is one of the mechanisms by which chloroplasts can respond to oxidative damage, since this pathway is important in bacteria. We hypothesize that the polyploidy of cpDNA serves as a buffer against the ROS-induced DNA damage, by providing many templates for recombinational repair. To test this theory, we examined whether cell lines overexpressing either the wild-type *E. coli* RecA gene or a dominant negative recA variant within the chloroplast were more or less resistant to the mutagenic effect of Rose Bengal.

EMPOWERMENT, LEADERSHIP, AND INTERGENERATIONAL DYNAMICS AMONG YOUNG WOMEN IN RURAL SOUTH AFRICA (SA)

Ramya Naraharisetti

Mentor(s): Jeanne Gazel (Integrated Studies in Social Science)

Rural Women's Movement (RWM) based in KwaZulu Natal is one of several NGOs active in addressing the HIV/AIDS epidemic by "shifting the attention to the necessity of empowering women and transforming gender-biased social structures". One of their main concerns although is sustainability. Like many other women's NGOs in South Africa, there is a notable lack of young female leadership. With the onslaught of HIV/AIDS, poverty and unemployment many of these young women lack the opportunity to gain leadership skills and build agency. The intergenerational dynamics of younger women and older women leaders is of particular interest when addressing this issue and could provide some insight into the barriers that young women face in a dynamic South Africa with shifting values and realities. It is integral that these women are given the proper tools to become mobilizers of social change, because pressing issues such as HIV/AIDS, unemployment, poverty and women's rights are in their hands. This project seeks to accomplish two goals (1) to identify intergenerational dynamics and barriers which prevent young women from attaining integral leadership positions in active community organizations or NGOs and (2) to create and implement an organic model of leadership development for young women based on the needs identified by rural communities within South Africa.

QUANTITATIVE ANALYSIS OF TUMORS

Daniel Nash

Mentor(s): Christina Chan (Biochemistry & Molecular Biology Cns)

Signaling pathways capture the molecular interactions and reactions between biological molecules resulting in a biological function. Pathway level analysis of large-scale biological data is mostly limited to the significance of expression levels of genes in different pathways. Our research is focused on understanding tumor formation through quantitative analysis pathways. Our aim is to analyze the signaling pathway associations for tumor formation. We are collecting the pathway information from Reactome database. We are going to construct a pathway network using integrative information from large-scale biological data and compare the significant changes in the pathway network, in order to characterize the tumor phenotype.

EFFECT OF METAL AND ALKYL SUBSTITUTION ON THE STRUCTURE AND MAGNETIC PROPERTIES OF DUAL LIGAND COORDINATION POLYMERS

Joseph Nettleman

Mentor(s): Robert Laduca (Associate Professor)

Four coordination polymers incorporating substituted glutarates and 4,4'-bipyridine (bpy) were prepared and structurally characterized. $[\text{Co}(\text{3-methylglutarate})(\text{bpy})]_n$ has isolated Co dimers which are linked into $[\text{Co}(\text{3-methylglutarate})]_n$ chains and then connected into 2-D slabs via the bpy ligands. This compound shows antiferromagnetic properties. $\{[\text{Co}(\text{3,3-dimethylglutarate})(\text{bpy})(\text{H}_2\text{O})] \cdot 2\text{H}_2\text{O}\}_n$ has Co carboxylate 1-D chains linked into a 2-D structure through the bpy. Antiferromagnetic coupling was observed, with "spin canting" at low temperatures. Using copper gave $\{[\text{Cu}^{\text{I}}\text{Cu}^{\text{I}}(\text{3,3-dimethylglutarate})(\text{bpy})](\text{ClO}_4)\}_n$, which has tetrameric $\text{Cu}^{\text{I}}\text{Cu}^{\text{I}}$ units linked into 2-D layers by 3,3-dimethylglutarate which in turn forms a 3-D "primitive cubic" net by bpy connections. Replacement of a methyl group with an ethyl group leads to a drastically different structure in $[\text{Cu}(\text{3-methyl,2-ethyl glutarate})(\text{bpy})]_n$. These have $\text{Cu}_2(\text{CO}_2)_4$ paddlewheels with equatorial-equatorial interactions leading to extremely strong antiferromagnetism. These paddlewheels are linked into a 1-D chain with the 3-methyl-3-ethyl glutarate ligands and into 2-D layers with the bpy ligands. Overall these small changes in metal centers and alkyl substitution led to drastically different structures and magnetic behavior.

ALOE VERA-CHITOSAN BLEND AS A NEW EDIBLE COATING FOR IMPROVING THE SHELF-LIFE OF STRAWBERRY (FRAGARIA X ANANASSA) DURING REFRIGERATED STORAGE

Tuan Nguyen

Mentor(s): Eva Almenar (School of Packaging)

Edible coatings are ultra-thin layers deposited on food surface; they are safe to co-consume with the food and, in most cases, prolong the shelf-life by reducing weight losses. Moreover, various studies have reported that common coating materials such as chitosan and Aloe vera gel also have antimicrobial activities. Chitosan, one of the best bio-based coating materials, is industrially produced by the deacetylation of chitin. Chitosan has been shown to delay ripening as well as decay caused by fungi on strawberries and table grapes. Another coating material, Aloe vera gel, is extracted from Aloe vera plant, a common tropical and subtropical plant. Aloe vera gel is edible and approved by the FDA as a natural food flavoring. The goal of this research is to develop a new coating based on Aloe vera gel and compare its effects on the shelf-life of strawberry fruit to those of chitosan coating. Strawberry fruit was chosen because of its popularity, typically short shelf-life, and crucial economic value. Strawberries are coated with water, 100% Aloe vera gel, and 100% chitosan. The main factors limiting strawberry shelf life such as mechanical injury, desiccation, and fungal infection are monitored by measuring changes in weight loss, soluble solid content, titratable acidity, color, texture, aroma, and microbial growth of treatment and control groups during storage at 3 degree Celsius. The fruits are analyzed after 0, 2, 4, 6, and 8 days. The effect of the types of coating on strawberry shelf-life shall be discussed.

SQUATTER SETTLEMENTS IN LATIN AMERICA: SANTA ELENA, VENEZUELA AND LIMA, PERU

Megan O'Brien

Mentor(s): Louise Jezierski (Social Relations and Policy)

I am looking at squatter settlements in Latin America through studying two case cities: Lima, Peru and Santa Elena, Venezuela. I am using these examples to look at how the government has recognized or ignored squatter settlements within these cities or on the fringes of these cities. While the settlements in these areas are similar, the political climate in each of these countries is different. Some squatter settlements have transformed into legally settled areas through the work of the individuals and families living there. This is the case of many squatter communities in Lima. Communities have organized for infrastructure and Lima has acknowledged the establishment of the settlements. I want to see how the success of these newly integrated communities is related to the efforts of the government. Although many governments have ignored squatters, I will look at the efforts that governments and NGOs have had at integrating squatter settlements into society. Have their efforts helped these communities? Or made it harder for these communities to work united for progress? I will compare and contrast the different environments, the formation of the settlements, and the community's internal and external connectivity. How are these settlements connected to the greater city, services, and community? To what extent are they structured and how are they organized? The communities are complex systems which share similar histories of settlement patterns, but each have contrasting methods of sustaining their communities.

ANALYZING DIFFERENCES IN SADDLE PRESSURE IN EQUINES

Katherine O'Connor

Mentor(s): Hilary Clayton (Department of Large Animal Clinical Sciences)

Excessive pressure exerted on the horses back through the saddle can cause muscle injury, pressure sores, poor performance in competition and behavioral problems. Saddles are constructed with or without a central core, known as a tree. The presence of a tree relieves pressure from the spinous processes of the vertebrae and helps to distribute the pressure on the long back muscles. We hypothesize that a treeless saddle will exert more pressure in a concentrated area because it lacks the central support structure that allows pressure to be distributed more evenly across the back of the horse. We will test this hypothesis by measuring the pressure distribution beneath a conventional saddle (with a tree) and a treeless saddle to determine which type of saddle has better distribution of pressure. In this study, conventional and treeless saddles that are used in the equestrian sport of dressage (Olympic discipline) will be analyzed. Conventional and treeless dressage saddles will be evaluated on trained horses. A pressure pad (Pliance Saddle System, Novel GmbH) inserted under the saddle will be used to measure peak pressure, mean pressure, pressure distribution and total forces on the horses' back normalized to the weight of the rider (Newtons/kg – N/kg).

ACTIVIST SOLIDARITY BETWEEN MICHIGAN AND CENTRAL AMERICA

Nkechi Okefor

Mentor(s): Miguel Cabanas (Spanish and Portuguese)

From 1980 to 1992 Central American countries suffered civil wars and military regimes. Honduras, El Salvador, and Nicaragua are connected in history due to the Leftist Insurgency in Honduras, the Contra/Sandinista conflicts in Nicaragua, and the FMLN revolutionary movement in El Salvador. The role of the United States in these wars was crucial with the military and economic support to right-wing undemocratic governments. Media coverage of Central American conflicts at the time contrasts with the work of human rights activists. For example, the Peace Education Center (PEC) of East Lansing, Michigan played a central role in raising awareness and increasing activism in the Lansing area regarding the role of the United States in the civil wars in Central America. I will analyze the solidarity connections the PEC made with various organizations local and international. My study primarily focuses on transnational alliances and solidarity to end human rights abuses in Central America. I will also study the involvement of Michigan State University's Center for Latin American and Caribbean Studies (CLACS) and other Lansing area organizations that may have worked with the PEC. Father Dick Preston of the Michigan Peace Team and former Michigan Congressman Howard Eliot Wolpe were important activists with the PEC on Latin American issues. Finally, my goal is to gauge how successful the PEC was in mobilizing the Lansing area to engage in the militarization of Central America and the abuses to human rights.

MY LONDON

Matt Ortlieb

Mentor(s): Robert Albers (Telecommunication, Information Studies & Media)

The inspiration behind My London came from Guy Maddin's film My Winnipeg, which our study abroad group attended at a small theater in Cambridge. My Winnipeg deals with the filmmaker's personal relationship with his hometown. The stories that Maddin tells during his documentary (or self described "docufantasia") may only be true to him. Other people (especially other residents of Winnipeg) may disagree with his stories and his "truths". During a question and answer session following the film in Cambridge, Maddin defended many parts of his film as his truths. One man from Winnipeg challenged him and Maddin quickly replied, "It's My Winnipeg. Not yours. Mine." My London was based in the thought that we all have our own unique relationships with the places that we've been. One late night in London, I wrote a poem called My London based on the principal that London is something unique to me. I have my own relationship with the city. There is a London that is only mine. I shared my writing with three of my friends from the program and asked them to write a poem with a similar format and theme. We were in London for the same study abroad program, yet we all have unique and individual relationships to the city and to our experience. This project gives a unique lens to look through to examine a study abroad experience from four different student's experiences.

LIFE (UN)WORTH LIVING: ETHICAL IMPLICATIONS OF PRENATAL SCREENING

Kellie Owens

Mentor(s): Mark Largent (Social Relations and Policy, STEPPS)

Since the advent of amniocentesis in the 1950s, millions of women have undergone prenatal screening to test for certain genetic abnormalities. Once recommended only for "at risk" women, the American College of Obstetricians and Gynecologists (ACOG) now advises that all women be offered these services. Popular rhetoric in both medical publications and news media hails these treatments as the next step in medical innovation, preventing disease before it strikes. Certainly, reducing birth defects is a worthy pursuit. But interestingly, these narratives consistently ignore the personal strife and complications a "positive" diagnosis entails. Prenatal tests prevent disease before it occurs using abortion as treatment. Emerging technologies that screen embryos before they are implanted into the uterus, while avoiding abortion, similarly prevent disease by preventing life. My research attempts to understand how American women and medical professionals approach prenatal screening. How does the polarized abortion debate affect opinion of prenatal screening? How did abortion become a mainstream treatment for birth defects? By analyzing both primary and secondary documents on prenatal screening, I will attempt to both define the current understanding of these technologies and suggest how this understanding evolved. The focus

of this research is not to produce an argument, but rather a diagnosis of the way American women and medical professionals approach prenatal screening. This research will assist women facing decisions to use prenatal testing as well as assist in understanding how science and technology become integrated into average American lives.

RELATIONSHIP BETWEEN MOLECULAR MECHANISM AND MODE OF INHERITANCE

Loren Palmeri

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 the various molecular mechanisms that underlie modes of inheritance. One potential scheme that will provide insight into the relationship between inheritance and action is to first classify genes according to a quantitative scale (non-essential, haplosufficient, and haploinsufficient) and then further classify them qualitatively. For example, genes should not be simultaneously both haplosufficient and haploinsufficient. Using this scheme, we have developed the hypothesis that 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," and that there is a wide range of possible gain-of-function effects due to the intricacy of molecular activity. Using prior research from OMIM and PubMed we developed data supporting this hypothesis for a set of genes tabulated by Andrew Wilkie in 2005. We found that for 72% of the genes in his table, the dominant mode of inheritance was caused by gain-of-function mutations. We further classified these gain-of-function genes qualitatively, finding that 82% act in a dominant-negative manner (mutant protein has adverse effect on wild-type function). The primary classification of genes based on this quantitative scheme will allow researchers to more closely examine links between molecular mechanism and mode of inheritance.

A SURVEY OF CULTIVATED TOMATO VARIETIES IDENTIFIES FOUR NEW MUTANT ALLELES AT THE GREEN- FLESH LOCUS

Priyanka Pandey

Mentor(s): Cornelius Barry (Horticulture)

The process of crop domestication occurs through the selection and subsequent propagation of novel alleles that improve traits of interest. Cultivated tomato (*Solanum lycopersicum*), particularly heirloom varieties, exhibit a wide range of variation in fruit size, shape and color. The green-flesh mutant of tomato possesses a stay-green phenotype resulting in fruits that ripen to a red-brown color, due to the retention of chlorophyll and the simultaneous accumulation of lycopene. The recent identification of the GREEN-FLESH gene provides a molecular tool with which to investigate the origin of a subset of heirloom tomato varieties that resemble the green-flesh mutant. Sequence analysis of the GF locus from twenty-six heirloom varieties revealed the existence of four previously unidentified null alleles. This study illustrates the potential of cultivated tomato varieties, including heritage cultivars, heirlooms, and land races, for uncovering new alleles in genes of interest.

THE EFFECTS OF SHORELINE DWELLING DENSITY AND INVASIVE ZEBRA MUSSELS ON GROWTH RATE OF LITTORAL FISH IN LAKES

Emily Pankey

Mentor(s): Mary Bremigan (Fisheries and Wildlife)

Shallow lake areas may become particularly vulnerable to two specific anthropogenic effects; (1) simplified littoral habitat associated with residential development along lake shores, and (2) altered habitat and food web dynamics associated with the invasive zebra mussel, *Dreissena polymorpha*. Understanding how dwelling density along lake riparian areas and presence/absence of zebra mussel affect growth rate of littoral fish will provide information about food web linkages and energy flow between the littoral and pelagic zones in lakes. For this, black bass (largemouth bass, *Micropterus salmoides*, and smallmouth bass, *M. dolomieu*) were sampled from the littoral zones of 8 southeastern Michigan lakes in 2006 and 2007 and scales were collected from each fish. The lakes span approximately 8 dwellings per km to 45 dwellings per km and 6 lakes contain zebra mussel. I am aging scales collected from each lake and each species to determine age and measuring radii between the center of the scale and each annulus to determine fish growth rates by back calculations. I expect a negative relationship between the growth rates of fish species and dwelling density due to alterations in the littoral zone by humans, leaving less energy and food available for each individual fish. I also expect a negative relationship between zebra mussel presence and growth rates because zebra mussels reduce the abundance of zooplankton and phytoplankton, possibly resulting in more competition among fish for limited food resources.

WARHOL: A CRITICAL ANALYSIS

Alexander Paris, Danielle Campbell, Deanna Domino

Mentor(s): Christian Lotz (Philosophy)

Our research presentation topic focuses on the Death and Disaster Series of Andy Warhol, also touching on some of his most popular works. We will argue that while Warhol wishes to make us believe that the morbid subjects he chooses to paint are free from implication and are chosen purely for their aesthetic value-artifacts of everyday, banal life-the end product not only stirs the emotions of viewers but also exists as a powerful descriptor of modern life. In addition, we will demonstrate how Warhol's work can be analyzed as such using Freud's psychoanalytic theory. In the destruction series, Warhol uses popular images from the news and media depicting violence and accidents as his subject matter. On the one hand, we argue that the fear of death is lessened because the viewers are bombarded with its presentation in so many aspects of life-a kind of saturation that works to desensitize the viewers. Warhol accentuates this process by highlighting the key images (atomic bomb, hanging etc) in repetition. On the other hand, we argue that the images and the way they are presented only serve to aggravate the viewer's psyche. We will argue that Warhol's Death and Disaster Series brings forth a conditioned response in the viewer which is something that Warhol explicitly denies. The use of repetition and coloration serves to reinforce traumatic experiences in viewers. We will also argue that these artistic techniques force all viewers to grapple with the idea of mortality.

QUANTIFYING CARBON SEQUESTERED IN MSU-OWNED FORESTS

Lisa Parker

Mentor(s): David MacFarlane (Forestry)

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. This research contributes to this effort through quantification of carbon sequestered in Michigan State University-owned lands and forests. The current focus is on campus plantings. To estimate sequestered carbon in urban tree plantings, the CCX provides two tables: one of 100 common forest trees and their growth rates and the second linking tree age and stem diameter at breast height (dbh). The first phase of research has been the expansion of the first table to include growth rates for the many other species planted on the campus of MSU, not currently described; over 2,300 species according to the database developed by the Central Planning and Administration (CPA). The second phase of

research will allow a linkage of the expanded CCX tables and CPA data, which will lead to the computation of an annual carbon emissions offset from campus plantings, with the ultimate goal of establishing MSU as the first CCX member to submit an Urban Tree Carbon Sequestration Offset project.

COLLEGE STUDENTS' PREFERENCES OF DESIGN AND SUSTAINABLE FEATURES IN RESIDENTIAL LIVING ENVIRONMENTS

Samantha Patrick

Mentor(s): April Allen (Interior Design)

College enrollment in degree-granting institutions increased by 16 percent between 1985 and 1995. There was an even greater increase of 23 percent between 1995 and 2005 from 14.3 million to 17.5 million. Enrollment is expected to continue to grow over the next ten years, adding approximately 1.4 million full-time students to campuses nationwide. As numbers of full-time students increase, there is a growing need to reevaluate living environments that were built years ago. Housing options and the living environment is rated as one of the top priorities of today's students in their choice of a college to attend. Dormitory-style units offering cramped, shared living spaces and communal bathrooms with little or no privacy may not appeal to echo-boomers who expect more privacy, options and features in their housing than prior generations. As more students prefer off-campus housing due to reasons such as cost, independence, and creature comforts, there is an increase in demand for student friendly communities near campuses. Designing and planning housing options that reuse existing land near campus with increased pedestrian connectivity and the inclusion of a wide array of on-site amenities can help achieve a sustainable environment that attracts the student population and others such as faculty and alumni. As designs become more complex, a combination of uses and efficiencies can respond to the echo-boomers' needs for privacy, technology and entertainment. This study examined college students' preferences in their living environment, location preferences, and design and sustainability issues.

MATHEMATICAL MODELING OF STEM CELL RESPONSE TO POLYELECTROLYTE MULTILAYER FILMS

Kendell Pawelec

Mentor(s): Christina Chan (Chemical Engineering and Materials Science)

Polyelectrolyte multilayers (PEMs), thin films consisting of electrostatically deposited polyelectrolyte layers, have enormous biotechnological potential. PEM's intrinsic characteristics, such as structural rigidity, swelling, thickness and surface morphology, are known to affect cell adhesion onto these films, and are influenced by many factors. A few of the most profound factors affecting these parameters are the salt concentration used during film assembly and the number of layers of polyelectrolytes deposited. Mechanics of the cell attachment onto a surface can be expected to vary with respect to these aforementioned factors, which may also be dependent on the cell type. A mechanistic knowledge of the inter-play between stiffness, swelling, thickness and cytophobicity/cytophilicity of these films can help in understanding the varying responses of cells to these biologically relevant substrates. Based on this information, a mathematical model was constructed which seeks to understand mesenchymal stem cell response to PEMs as a function of PEM thickness. Polyelectrolytes which are known to support stem cell differentiation were used to construct PEMs and the thickness of the films assembled with these polyelectrolytes was varied by changing the number of layers and salt concentration. Modeling can help provide insight into the response of the stem cells to these PEM parameters.

BIOSYNTHESIS OF GOLD NANOWIRES

Ryan Pawloski

Mentor(s): Evangelyn Alocilja (Biosystems and Agricultural Engineering), Edith Torres-Chavolla (Biosystems and Agricultural Engineering)

Gold nanoparticles are a revolutionary resource being used in fields from nontechnology to biosensors, all derived from their unique conductive abilities. The current fore-runner in the synthesis of gold nanoparticles is through chemical processes, which are costly and potentially hazardous to the environment. Fortunately, extensive work is being done in the field of biosynthesis of conductive nanoparticles using microorganisms, which are leading to breakthroughs in the biological synthesis of gold nanoparticles. This new methodology is not only more cost effective—requiring only bacteria cultures and gold chloride solution—but is also safer for the environment. The main objective of this project is to use these “green-produced” nanoparticles in the formation of gold nanowires that are up to several millimeters in length. For the nanowire production, *Bacillus subtilis* cultures are mixed with a biosynthetic gold nanoparticle solution and introduced into a stressful environment, with suboptimal temperature and nutrients. This stress causes the bacteria to connect end to end, forming a long chain of bacterium. Once connected, gold nanoparticles are attached to the cell membranes of the *Bacillus* cells, creating long wires nanometers thick. Once formed, these nanowires are conductive, which creates potential for their use in nanotechnology and biosensors. Through the use of gold nanowires produced by biological synthesis, biosensor devices will be able to become smaller, cheaper, and more sensitive; improving their overall efficiency.

AFFECTS OF AGRICULTURAL METHODS ON CROP MUTUALISMS

Kathleen Peshek

Mentor(s): Emily Grman (Plant Biology)

Arbuscular mycorrhizal (AM) fungi associate with crops, such as corn (*Zea mays*) and soybeans (*Glycine max*) through relationships that range from parasitism to mutualism. Those relationships are essential to agriculture because plant benefits, from an AM fungi mutualism, include an increase in plant biomass. However agriculture methods, such as tillage, no tillage, and organic, themselves can affect the mutualistic interactions between AM fungi and crops. Using R analysis I found no significant correlation between *Zea mays* plant height and the practiced agricultural method (treatment). A further analysis of *Glycine max* plant height discovered a significant relationship between plant height and the field repetition four. Field Repetition was also significant in the correlation between *Glycine max* above ground biomass with the treatment and field repetition four. Total *Glycine max* biomass had a significant relationship with field repetition four. This data suggests that a mutualistic relationship was not present between the AM fungi and their host crops because no significant differences were observed across the varying agricultural treatments. Instead my results could be explained by the varying history of the field repetitions, such as previous crops and agricultural methods. Repetition four differed significantly, which indicates that its' soil had a different competition, possibly due to its' previous history, than the other repetitions, which could help develop more sustainable farming practices.

COMPARISON OF INNOVATIVE BROMINATED AND CHLORINATED POLYSTYRENE HYDANTOIN POLYMERS FOR HOUSEHOLD WATER TREATMENT

Lauren Peterson

Mentor(s): Joan Rose (Fisheries and Wildlife)

Diarrheal disease is a major health problem in the poorest areas of developing countries that kills 1.8 million people a year, many of them young children. Diarrheal disease is often caused by fecally contaminated waterways that cause viral pathogens to work its way into a community's drinking water. Also, diarrheal disease can be caused by toxin-producing blue green algae also present in waterways. A new approach for delivering chlorine or bromine via

contact disinfectants has been evaluated in a gravity fed household drinking water design. Both bromine and chlorine canisters were tested in triplicate against MS2 virus and microcystin toxin to determine their efficacy in neutralizing both the virus' and the toxin's pathogenicity. Results show that while both the bromine and the chlorine canisters were effective against viruses, the bromine canister had a higher average reduction than the chlorine canister ($5.41 \pm 1.39 \log_{10}$ and $3.81 \pm 2.08 \log_{10}$, respectively). For the bromine canister, microcystin (at average concentrations of 2198.3 ng/L, 106.1 ng/L) was reduced by 86.9%, while the chlorine canister (at average concentrations of 2182.5 ng/L, 87.4ng/L) reduced microcystin by 26.7%. Only the bromine units consistently produced water below the 1000ng WHO level. New technologies like this HaloSource® contact disinfectant resin offer many advantages over current disinfection options, including cost and ease of use.

INFERRING A PETROGENETIC HISTORY USING THE GEOCHEMISTRY OF OLIVINE CRYSTALS IN MANTLE XENOLITHS

Allison Pluda

Mentor(s): Tyrone Rooney (Geological Science)

Mantle xenoliths can be used to infer the petrogenetic and geochemical history of the lithospheric mantle. By comparatively examining the relative abundances of trace elements in olivine, it is possible to deduce the source fertility and geochemical history of the lithospheric mantle. Prior studies have examined the geochemistry of xenoliths by using whole rock analysis or by exploring clinopyroxenes specifically, as clinopyroxenes tend to have the highest abundance of trace elements in normal xenoliths. Since some xenoliths may not contain any clinopyroxene, a study of trace elements in olivine provides more information on mantle processes. Although olivine studies have been applied to Martian meteorites (Usui et al., 2008 and Bérczi et al., 2006), the lack of data on terrestrial analogues has made interpreting the data difficult. The petrologic setting of the plume influenced Lake Tana region in Ethiopia can be used as an analog to the olivine-phyric shergottite group of the SNC Martian meteorites. The Lake Tana xenolith suite is an excellent area to examine the effects of plume-lithosphere interaction, located on the western Ethiopian Plateau (Rooney et al., 2005). Comparison of geochemical data using similar techniques undertaken on olivine from meteorites to those in the Lake Tara will provide a much-needed constraint and improve the geochemical interpretation of Martian meteorite samples, as well as allow for a relatively new technique to be applied to explore differences in results between looking at geochemical data from olivines and any previously studied methods.

SPHERE - AN EXPERIMENT IN SIMPLIFYING GAMEPLAY, SCOPE AND CONTROLS IN VIDEO GAMES TO FACILITATE GREATER PLAYER IMMERSION

Andrea Pollitt, Mathew Mason, Daniel Shillair, Bruno Sommer

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

In the past two decades, video games have risen to become one of the most consumed forms of digital entertainment. Video games have the ability to trick the player's brain into actually feeling like they are within the game world. This is a phenomenon that game designers like to call "immersion". Often games are designed entirely around this premise. In the past, this has usually been accomplished by attempting to make the world as lifelike as possible. Realistic 3D graphics and sound alongside fluid controls usually provoke immersion. During the design of our game, Sphere, we decided that we would go against that mode and attempting to make the controls, game-world and game-play as simple as possible. We theorized that it may actually be easier to immerse yourself in a video game if the barriers to entry, namely learning the controls and game-play, were as minimized as possible. Sphere is our realization of this theory. We have created a very simple, yet fun and addictive puzzle game that any player can learn within a few minutes. In depth play-testing was done by a variety of players and our experiment revealed that Sphere was a very easy to pick up game, while at the same time possessing very fun and meaningful game-play. The ability to enthrall your audience into playing your game for long periods of time is becoming increasingly more valuable as the game industry moves toward different revenue models, such as monthly payments, or ad-based revenue.

FUNCTIONAL MRI USING VASCULAR SPACE OCCUPANCY (VASO) AND VASCULAR SPACE OCCUPANCY WITH TISSUE SUPPRESSION (VAST)

James Poteracki, Karen Bates, Madison Chomsky, Shannon McCarthy, Zach Steffes, Andrew Worden

Mentor(s): Ronald Meyer (Physiology), Jill Slade (Radiology), Robert Wiseman (Physiology)

When one uses his or her muscle or brain, blood flow to that tissue increases. Functional MRI studies take advantage of these differences in blood flow, and associated differences in blood volume, to map where the activity occurs. The actual increase in the blood volume is very hard to pinpoint, especially with the noninvasive methods more commonly used for functional MRI, which depend more on blood oxygenation (the BOLD effect) than blood volume. There are, however, two new MRI techniques which may be used to accurately measure this increase in blood volume. The first method, known as VASO, involves suppressing the signal from the blood. Thus, one can determine the blood volume increase by examining the suppressed signal. The second method, called VAST, suppresses the tissue so that the increase in blood volume can, in principle, be directly measured. We will be combining these two methods to more accurately measure the increase in blood volume in skeletal muscle after exercise. Specifically, we will use VASO and VAST, and we will also gather data by suppressing other signals. Eventually, we will be able to get a direct measurement of the increase in blood volume. We hope to extend this for use in studies of the brain. When a mental task is performed, there is an increase in cerebral blood volume in a corresponding area of the brain.

THE IMPLICATIONS OF ELIMINATING THE PROPERTY TAX

Anupama Prasad, Andrew Bristle

Mentor(s): Ron Fisher (Economics)

The property tax has long been the most disliked form of taxation among Americans, yet the reason for this is not clear. Recently, there have been initiatives in several states to eliminate or significantly reduce property taxes, and this project examines the causes behind these efforts. This presentation explores the recent attempts in Indiana, Georgia, Florida, and Texas to reduce property taxes and compares them with the past cases of California and Michigan. An analysis of property tax and government expenditure statistics in these states showed that, while the states vary widely in these categories, with some being above and some below the national averages, the growth rate of property taxes is consistently high (Georgia being an anomaly). Since a major cause of these initiatives to eliminate property taxes is concern over the growth rate of property taxes, policymakers should explore methods such as calculating taxable value on a rolling average, employing multi-year property tax levies, and offering monthly property tax payment plans. If property taxes are eliminated, there will be implications for local governments and school districts; the elimination of the property tax would significantly reduce their fiscal autonomy, and would require expansion of state intergovernmental grant systems to account for the loss in revenue. However, because most states already have a framework for state grants to school districts but have no similar procedure for general purpose grants, replacing revenue to local governments will likely be a difficult process.

A NEW GREEN ECONOMY

Adam Rademacher

Mentor(s): Amol Pavangadkar (Journalism)

This project aims to spotlight businesses and research in Michigan that utilize renewable resources to build and develop a sustainable economy. The videos produced highlight these researchers and companies which are aiming to drive this new economy and job market of the twenty-first century. Michigan currently faces a pivotal turning point in the fundamentals of its economy. As our country turns away from fossil-fuels, Michigan stands poised to capture a great share of the new bio-economy. The abundant natural resources and excellent research universities can help create a new economy based in Michigan. 'A New Green Economy' features only a fraction of the research and progress being made in the field of bio-economics. Our hope is that this glimpse into a promising and emerging field will help to further stimulate interest and research in something that will be a vital part of our future and possibly a staple of Michigan's evolving economy.

BIOSYNTHESIS OF GOLD NANOPARTICLES

Romali Ranasinghe

Mentor(s): Evangelyn Alocilja (Biosystems and Agricultural Engineering)

Gold nanoparticles have a number of unusual properties that have a wide range of potential applications in optoelectronics, biomedical devices, and as transducers in biosensors and bioprobes. Currently, the popular methods of production use physical and chemical processes. However, harnessing the natural metabolic activity of biological organisms would provide an economically viable, "greener" alternative that eliminates the use of toxic chemicals. Thermomonospora species are extremophiles that have adapted to harsh conditions through novel systems of metabolism and energy transduction, including the reduction of ambient metal ions. In addition, actinomycetes are known to secrete large quantities of enzymes (reductases), resulting in high nanoparticle yield. They also reduce metals under easily-reproducible conditions, and produce monodispersed particles. The actinomycetes *T. fusca*, *T. chromogena* and *T. curvata* were selected as bio-nanofactories due to their extracellular gold reduction, which facilitates nanoparticle extraction. Using a modified methodology, the three species were cultured in different media. The produced mycelia were incubated in HAuCl₄ solutions, varying the pH. The pale yellow solutions turned an increasingly dark purple, as the actinomycete reduced the AuCl₄⁻ to nano-sized Au particles. UV-vis spectrum, Transmission Electron Microscopy (TEM) images, and nano-size measurements were used to characterize the gold nanoparticles and to identify optimum conditions of production. Z-potential readings are currently being used to detect potential protein-coating. Successful production of biologically synthesized gold nanoparticles will contribute to the development of "green" biosensor devices.

THE EFFECTS OF POLITICAL PARTISANSHIP ON BELIEFS ABOUT GLOBAL WARMING WITHIN A SCIENTIFIC COMMUNITY

Elizabeth Ratzloff

Mentor(s): Aaron McCright (Lyman Briggs, Sociology)

Previous studies have shown that one's political partisanship greatly affects one's beliefs about environmental issues, specifically global warming. Even more so, one's political partisanship strongly determines one's support for global warming policies among the general public. Because there is general consensus among the scientific community on the causes and effects of global warming it may indicate that scientists generally agree and support about global warming policies. The purpose of this experiment was to determine if political partisanship influence scientists' beliefs about policies, just as it does for the general public. A standardized, self-administered, internet-based survey was given to the Kellogg Biological Station community to assess understanding of global warming and support for global warming policies. The results showed a moderate to moderately strong, statistically significant relationship between political partisanship and different indicators of understanding of global warming (P<0.01). Self-identified Democrats report a stronger understanding of global warming than do self-identified Republicans. Political partisanship has a statistically significant effect on different indicators of support for government action regarding global warming (P<0.01). Self-identified Democrats are more likely to report willingness for taxing to help mitigate global warming effects, for more governmental regulation regarding global warming, and more support to sign the Kyoto Treaty. This indicates that no matter how educated a person is in science, his/her partisanship still significantly influences that person's beliefs about controversial scientific issues. Understandings and beliefs on global warming are largely determined by a person's political partisanship.

TEACHERS VERBAL BEHAVIORS ACROSS CONTEXTS WITH NATIVE AND NON-NATIVE SPEAKERS OF ENGLISH IN PRESCHOOL PROGRAMS FOR AT-RISK CHILDREN

Linda Rau

Mentor(s): Hope Gerde (Family Child Ecology)

Children's race, ethnicity, and family income correlate with significant achievement gaps at kindergarten entry (Brooks-Gunn, Rouse, & McLanahan, 2005). Non-native speakers of English living in poverty are particularly at risk for reading deficits (Brooks-Gunn, et al., 2005). Our knowledge of how teachers support language and literacy development for Non-Native Speakers of English (NNS) vs. Native Speakers of English (NS) in the classroom is limited. The present study examines teachers' language in classrooms consisting mostly of NS (n=30) or NNS (n=11). All classrooms served children identified as "at-risk" due to economic circumstances. Teachers' language across classroom contexts (book reading and free play) was coded for frequency of various types of utterances: questions, definitions, statements, behavioral directives, and letter utterances. ANOVA results indicate that teachers of NNS used more simple statements, simple behavioral directives, and choice questions in both contexts than teachers of NS. In contrast, teachers of NS used more multiple-word response questions in book reading and more expanded statements and letter utterances (i.e., utterances linked to child language and literacy outcomes (Gerde & Powell, 2006)) than teachers of NNS. Also, across all teachers there was little use of expanded behavioral directives or definitions across both contexts and multi-word response questions in free play. In addition, NS hear more new language input (i.e., expanded statements) than NNS. These results suggest that teachers' language use is a function of the English language abilities of the children in their classrooms. Future work should investigate the importance of these utterances for NNS.

DOING BUSINESS IN THE UNITED STATES: STARTING A BUSINESS

Daniel Redford, David Carlson, Matthew Murray, Natalie Pruett

Mentor(s): Ross Emmett (James Madison College), Bryan Ritchie (James Madison College)

This project, through the Michigan Center for Innovation and Economic Prosperity (MCIEP), applies the methodology of the World Bank's "Doing Business" index to the 50 states of the United States as well as the District of Columbia. Our presentation will focus on our ranking of states in terms of the ease of starting a business, the first of ten categories in the World Bank model and the starting point of our research. The World Bank's starting a business methodology ranks countries along four categories: procedure, time, cost, and paid-in minimum capital. We have made the necessary changes to appropriately apply this methodology to the unique conditions of the United States. Early research indicates that state policies vary widely, and our index shows potential areas for improvement in individual states. Along with ranking the states and the District in these terms, this index will help

businesses determine location, and will help state governments craft policies to encourage business. Our research will seek to draw conclusions about and make recommendations for the state of Michigan, consistent with the broader goals of MCIEP.

CALMODULIN INHIBITION AFFECTS DEFLAGELLATION RATE IN CHLAMYDOMONAS REINHARDTII

Jessica Rice

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

Calmodulin, a calcium sensing protein, is an important factor in numerous cell activities in the green algae *Chlamydomonas reinhardtii*. Inhibiting calmodulin with the chemical trifluoperazine has an effect on the calcium ion concentration at which deflagellation occurs. Calmodulin inhibited *Chlamydomonas* cells and calmodulin uninhibited cells display quantifiable differences in motile abilities when placed in varying concentrations of calcium ions measured using light microscopy. Both inhibited and uninhibited cells were placed in calcium ion solutions with concentrations ranging from .0005mM to 1mM. The uninhibited cells never entirely deflagellated even when the calcium ion concentration was at 1mM. On the other hand, calmodulin suppressed cells were entirely deflagellated at the calcium ion concentration of .5mM. Therefore, by suppressing calmodulin, cellular deflagellation could occur at a lower calcium ion concentration than necessary to deflagellate uninhibited cells. Motile cells at the calcium ion concentration of 1mM used calmodulin to take up excess calcium ions, thus allowing them to retain flagellum.

ALGAL LIPID SYNTHESIS AND BIOFUELS PRODUCTION

Ernest Richards

Mentor(s): Christoph Benning (Biochemistry)

Biodiesel fuel is derived from the lipid extracts of plant material which are cleaved in a transesterification reaction that forms the methyl esters that will be used as fuel. Insight into the synthetic pathways involving lipid synthesis may provide methods for enhancing algal lipid production which would have a consequently positive impact on the overall fuel yield. Characterizing patterns of regulation in the synthesis of lipids as well as the characterization of enzymes that modify lipid structure will allow for algal lipid synthesis to be engineered for towards the production of lipids that need minimal processing.

UNCOVERING THE SILENCE: YOUNG WOMEN INVISIBLE IN SUDAN'S CIVIL WAR

Chelsea Ridenour, Allison Burkholder, Carli Zyskowski

Mentor(s): Julia Grant (Social Relations & Policy)

Great attention has been given to the experiences of the Sudanese Lost Boys who were forced from their homes and subject to over a thousand miles of trekking in the African wilderness to eventually live the life of a refugee. Our work intends to highlight the profound absence of the female story in this narrative. From the time of the village raids to the place of current residence, this paper traces the paths of the young women. Whereas the young men in the story traveled as a cohesive group, the young women were fewer in number and displaced from the group at each stage of travel. The silence at the many stages is attributed first to the circumstances of Sudanese guerrilla civil war, to the refugee camp policies that catered blindly to the traveling community gender standards, and finally, to the internal conflict associated with the transition of refugees and the lack of educational preparation that kept young women isolated from society in the United States. The study has broad implications, illustrating the story of women who are forgotten in the retelling of war stories, and strides women have been able to make towards their own empowerment despite their assumed identities of submission and dependence.

MUTATIONAL EFFECTS OF MYOSIN 15A: THE CORRELATION OF MYOSIN 15A AND HEARING LOSS

Andrew Riedy

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

Autosomal recessive hearing loss has been linked to several genes among which connexin26, pendrin, and otoferlin are the most common. Our lab has completed testing for each of these 3 possible genetic mutations in a family with a daughter who has as of yet unexplained hearing loss. The next most prevalent gene in line for autosomal recessive hearing loss is myosin15a. Myosins are a large family of motor proteins responsible for actin-based motility. Myosin 15 is involved in the structure and motion of the stereocilia of the cochlea. Contrary to other myosins, myosin 15a has a long N-terminal extension right before the N-terminal domain, which appears to be critical for proper hearing. SNPs were taken from the upstream region and throughout the myosin 15a gene. Primers were then devised to amplify the genomic DNA around these SNPs. Combinations of PCR using the daughter's DNA and specific restriction enzyme digests are currently being analyzed to determine if a mutation in the myosin15a gene is the cause of this unexplained hearing loss.

THE MUSLIM BROTHERHOOD AND EGYPTIAN POLITICS

Brian Riedy

Mentor(s): Waseem El-Rayes (James Madison College), Ramazan Kilinc (James Madison College)

This oral presentation will focus on an analysis between social and religious institutions in Egypt and their affect on Egyptian political institutions and state policy. The reverse relationship will also be discussed on the impact of Egyptian state policy and political institutions on Egyptian ideological social and religious movements. The time frame of this analysis will focus on Egypt following the Second World War and through to the assassination of Egyptian leader Anwar Sadat. The primary religious and ideological group that will be discussed in Egypt will be the Muslim Brotherhood. The most specific analysis of this presentation will focus on the give and take relationship between Egyptian leader Gamal Abd Nasser and Muslim Brotherhood Ideology, Sayyid Qutb.

EDUCATION AND RECONCILIATION IN NORTHERN IRELAND

Tanya Rodriguez

Mentor(s): Linda Racioppi (James Madison College)

Despite the progress made in ending armed conflict, Northern Ireland remains a deeply divided society. How to approach these divisions is still a major topic of debate. Part of this is the question of whether it is possible to live peacefully with these divisions or if they must be eradicated for sustained peace. One area where division is entrenched is the education system, or rather systems, within Northern Ireland. Divisions encountered elsewhere in Northern Ireland are perpetuated via the education systems. Education in Northern Ireland is also at a critical nexus of culture, community and identity. This presentation explores the role of the education systems and youth cross-community contact schemes in the reconciliation process in Northern Ireland. Several questions arise: How effective have these initiatives actually been? What role do these initiatives play in addressing the root of the conflict and preventing future violent conflict? What are needed in the realm of education are multifaceted approaches: both cross-community and single identity approaches, both integrated education and cross-community contact programs. Targeting schoolchildren in cross-community efforts

works to ensure a peaceful society in the future. Addressing the polarization of society is critical because the parallel structures are undesirable in the long run. The case of education in Northern Ireland is in some ways very unique but it still may provide lessons for reconciliation in other conflicts.

SEM ANALYSIS OF CROSS-LINKED POLYACRYLAMIDE

Tyler Roenicke

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

This study explores the physical structure of Cross-linked Polyacrylamide (IUPAC poly(2-propenamide), which is commonly known as water-gel crystals. The purpose of understanding the structure is to better understand the means of the polymer's super absorption capabilities. By coating the polymer in gold and using a Scanning Electron Microscope (and accompanying software), it is possible to resolve highly magnified images. The information is then compared with the chemical properties of poly(2-propenamide) and determines whether the physical structure plays a role in its ability to absorb 50+ times its weight in water.

STUDY OF POLYMATHS: NOBEL PRIZE WINNERS IN ECONOMICS

Jeong-hwan Roh, Tina Ok

Mentor(s): Michele Marie Root-Bernstein (Theatre), Robert Root-Bernstein (Physiology)

The purpose of this project is to test the hypothesis that highly creative people are more likely to be polymaths than less creative people by comparing the range and incidence of adult avocations of Nobel prize-winners in economics to those of Nobel laureates in the sciences and to the general population. Our primary source is the official Nobel Prize website (<http://nobelprize.org>). These essays were supplemented by book-length biographies and autobiographies and essay collections. Every example of an adult avocation or hobby was encoded in an Excel spreadsheet and autobiographical or biographical comments about these avocations entered in a Word document. The data were compiled and the incidence calculated for each avocation or hobby. The individual avocation data were also aggregated into larger groupings (visual arts, music, writing, crafts, performing arts, and sciences). The Nobel data were then compared with data gathered in a previous study of Nobel prize-winning scientists (Root-Bernstein, et al., 2008) as well as to data on the avocations of the general population drawn from the U. S. census and the statistical significance of differences determined by chi-squared analysis. Pearson's R was also calculated for each comparison. Nobel prizewinners in economics are like Nobel laureates in the sciences in being statistically significantly more likely to have multiple adult avocations than the average person. Unexpectedly, Nobel laureates in economics are also much more likely to have multiple professional careers or training than Nobel laureates in the sciences.

THE STATUS OF GEOGRAPHIC RACIAL EQUALITY IN THE MUNICIPALITIES OF SEATTLE

Morgan Rose

Mentor(s): Joe Darden (Geography)

This paper examines geographic racial equality between Whites and Blacks in the municipalities of Seattle, Washington. Geographic racial equality between these races is determined based on income, occupational status, educational attainment, and residential segregation. Data was collected from the United States Bureau of the Census Summary File 4 for 2000. The hypothesis is that geographic racial equality exists within 1 municipality between Whites and Blacks in Seattle metropolitan area. Socioeconomic factors such as income, education, and occupation, were measured by comparing the differences between the groups. The index of dissimilarity based on census tracts was used to measure residential segregation. Geographic racial equality was found in one of the municipalities. Thus the hypothesis was accepted.

HISTORICAL DECLINES IN SEAGRASS ABUNDANCE REVEALED THROUGH BOTTLENOSE DOLPHIN STABLE ISOTOPE ANALYSIS

Sam Rossman

Mentor(s): Peggy Ostrom (Zoology)

Over the course of the last 100 years marine ecosystems have suffered profound damage from human activity. Perhaps the worst harm has occurred in coastal area due to their proximity to anthropogenic forces. Historical records suggest seagrass cover, the staple of coastal ecosystems, has been depleted greatly in most near-shore communities compared to before human development. However, data for this disturbance is not well documented and limited to a few areas. Annual growth layers from the teeth of bottlenose dolphins (*Tursiops truncatus*) may serve to provide valuable new data on coastal ecosystem decline. This is possible because seagrass incorporates carbon isotopes into its biomass to a greater extent than the other major primary producer, phytoplankton. These differences are passed up the food web so that the isotope values for a top predator in a seagrass community are similar to that of seagrass. Conversely, if the predator relies more on phytoplankton communities their carbon isotope value will be lower. The bottlenose dolphin, as a top predator, serves to integrate seagrass and phytoplankton isotope values indicating which is responsible for the bulk of primary production in any given ecosystem. The tip of the tooth is formed in the dolphin's first year and can thus indicate which carbon source comprised the base of the food web for dates as far back as 1944, given dolphin's longevity. Results indicate dolphins from the 1940's and 50's utilized seagrass to a greater extent than present dolphins in Sarasota Bay, Florida. This indicates large scale seagrass die offs after the 1950's.

PROTEIN SECRETION

Alison Roth, Munira Momin

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

The type II secretion pathway is used by gram-negative bacteria to transport folded proteins from the periplasmic space into the extracellular space. Twelve to 15 genes that are essential for its assembly. The pilin-like protein EpsG is required for the secretion of toxins in *Vibrio cholerae*. Deletion mutations in the epsG gene abolish the secretion of proteins. The purpose of this study is to determine the function of the EpsG protein in the process of secretion. Mutant epsG proteins were screened for their ability to complement a protease secretion deletion mutant of *V. cholerae*. Variant epsG proteins could not be detected in mutants that could not complement the secretion defect. This suggested that in *V. cholerae*, when the non-active variant EpsG are transported into the periplasm, they are recognized as misfolded proteins and destroyed. A candidate for the periplasmic peptidase that could perform this function is the protease DO. To test this hypothesis, mutants in the DO protease will be evaluated for their ability to support detection of the variant epsG proteins when co-expressed in secretion-deficient *V. cholerae*.

ADULT STUDENTS AND COMPUTER SKILLS IN MID-MICHIGAN

Veronica Roth

Mentor(s): Maryhelen MacInnes (Sociology)

With an uncertain economy stretching well into the foreseeable future, Michigan is, in many respects, a manufacturing state floundering in a sea of advancing technology and innovative breakthroughs. Unskilled workers are at the forefront of disadvantage and adult education, especially in regard to

computer technology, would seem to be a key aspect in workers transitioning to the white-collar economy. By gathering data on 45 adults seeking out computer skills classes, it will be possible to describe certain characteristics of these learners, and ascertain the participants' perceived effectiveness of these programs. The study consists of two phases: the first phase utilized surveys and interview methods to learn about the participants and the second phase, using the same methods, looks for the effects the class may have on the participants' lives. This research provides for an exploration of the need for computer skills amongst adults, as well as the difficulties they face while trying to get these skills. Special attention has been paid to the issue of employment. The findings of this study are meant to highlight the needs of people who take these courses, and to also provide a description about the advantages and disadvantages people face in obtaining these skills.

IDENTIFICATION OF THE MOLECULAR SIGNALS INVOLVED IN THE RESPONSE OF NEISSERIA GONORRHOAE TO HOST CELL CONTACT

Hannah Rowe

Mentor(s): Cindy Arvidson (Microbiology and Molecular Genetics)

Neisseria gonorrhoeae is the causative agent of the human sexually transmitted infection, gonorrhea. Previous gene expression studies in the Arvidson laboratory have shown that *NG1684*, which encodes a hypothetical protein of unknown function, is the most highly upregulated of all genes induced in gonococci adherent to epithelial cells derived from the female genital tract. This work was undertaken to identify the molecular signal(s) involved in this regulatory event, with the working hypothesis that the signal(s) would be molecules at or near the epithelial cell surface. We fused the *NG1684* promoter to a *lacZ* reporter gene, and introduced this construct into wild type and selected regulatory mutant backgrounds. β -galactosidase activities were determined after growth of strains in the presence of candidate signals. Since eukaryotic cells, which contain phospholipids at their surface, can release free fatty acids by the activity of phospholipases, the first candidate molecule we tested was the long-chain fatty acid palmitic acid. Our results indicate that the addition of palmitate to the culture medium (at doses not toxic to the bacterium) results in increased *NG1684-lacZ* expression. Additional long chain fatty acids will be tested to determine the specificity of this response.

CLICK CHEMISTRY POLYMERS

Daniel Rudnik

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

A new polymer synthesis technique known as "click" chemistry uses a single monomer that allows the placement of a broad range of pendant functional groups onto polymer backbones. Click chemistry allows for the placement of different Poly-ethylene glycol chains along the backbone with precise control of length and composition. The Baker research group is currently working to use click chemistry to create a selective drug delivery system. The brain's blood barrier restricts the passage of various chemical substances and microscopic objects between the bloodstream and the neural tissue itself. This blood barrier protects our brain from dangerous bacteria, but also inhibits the passage of drugs which could help cure brain related illnesses. Click chemistry can allow certain functional groups that the blood barrier will recognize to be attached to the polymer to allowing it to pass through. Our main objective is to create a drug vehicle that can pass through the brain barrier, and then release its "cargo" on the other side without any harmful side effects.

CHOREOGRAPHY AS RESEARCH-RESEARCH AS CHOREOGRAPHY

Michelle Ryba, Mary McGorey, Krysta Michorczyk, Shayna Reedy

Mentor(s): Sherrie Barr (Theatre)

Dance making is a process in which choreographers need to continually ask questions about the way they investigate movement. New choreographers often emphasize the end product of the dance, neglecting the physical and cognitive questioning that is critical to the dance making process even though it will enhance the end product of the dance. Laban Movement Analysis (LMA) is used as an integral research tool to assist novice choreographers in delving into the process of dance making. The LMA framework serves as a cognitive and physical means to delve into movement's fundamental components - body, effort, space and shape. Critical engagement in LMA facilitates choreographic journeys while simultaneously offering a type of language to articulate these discoveries. Through this choreo-learning laboratory, we are given the opportunity to arrive at embodied knowing which enables us to collaboratively explore feedback through movement and words. In becoming more affluent with LMA as a research tool and language, additional possibilities become available, revealing dance as a humanistic field of studies as much as it is a performing art. Through our research, we develop a unique ownership of our choreography as well as make realizations about ourselves as people.

PHOTOMETRIC SURVEY OF GLOBULAR CLUSTER SYSTEMS OF EARLY-TYPE GALAXIES

Nathan Sanders

Mentor(s): Stephen Zepf (Physics and Astronomy)

Globular cluster (GC) systems are studied to derive the formation histories of early type galaxies. Intermediate age GC populations reflect star formation episodes postdating the collapse of the protogalactic cloud and have been linked to instances of galactic interaction. Infrared observations are compared with optical photometry to break the age-metallicity degeneracy that results in large uncertainties when photometry from only one waveband is available. A photometric reduction routine implementing IRAF and Terapix SExtractor has been developed and applied to K-band (near-infrared) observations of NGC 1399 and 4594 from the ISPI instrument of the CTIO 4-meter telescope. The largest available infrared GC catalog for these galaxies has been produced. Each catalog has been compared with previously published optical datasets and to three simple stellar population models to accurately estimate the age and metallicity of the GCs. Further comparisons are being made to Chandra ACIS X-ray photometry. X-ray sources in GCs of early-type galaxies, which have few remaining massive stars, are typically low mass X-ray binaries (LMXBs). Several previous studies have suggested that LMXB formation is strongly dependent on metallicity, but this dependence is not well accounted for by current theory. The ISPI catalog produced for this study provides accurate metallicities for each LMXB which can be used to investigate this dependence. Further near-infrared observations are planned for the Spartan IR camera recently installed on the SOAR telescope at Cerro Pachon, Chile to extend the GC system survey.

DEVELOPMENT OF A QUALITY OF LIFE INVENTORY FOR THE HEARING IMPAIRED

Stephanie Sanders, Rebecca Rajasekhar, Kristi Viaches

Mentor(s): Jerry Punch (Communicative Sciences & Disorders)

Hearing impairment currently affects more than 32 million Americans. The prevalence of hearing loss greatly impacts the education, employment, and well-being of these individuals. Fewer than 25% of people who could benefit from hearing aids, many of them older adults, actually wear them. There is an increasing need to motivate hearing-impaired adults to seek audiologic diagnostic and rehabilitative services. As part of a long-term project to develop an online hearing inventory that can identify hearing handicap, this study investigated the impact of hearing loss on quality of life (QoL). This was done by convening a focus group consisting of hearing-impaired individuals with impairments ranging from mild to profound. They were asked to share their

insights regarding those aspects of their lives that have been most affected by hearing loss. Specifically, we asked the participants to: (1) define what quality of life means to them, (2) using the Critical Incident Technique, identify specific situations or incidents that had occurred in their lives that were directly or indirectly associated with their hearing loss, and (3) describe strategies they have found helpful in coping with those problematic incidents. Results, which revealed some new and clinically relevant information on hearing impairment, will be summarized and discussed. The results will be used to develop a QoL questionnaire, or inventory, that we plan to evaluate and validate as an online instrument that can be used to identify hearing-impaired individuals and to quantify the benefits obtained from audiologic rehabilitation such as hearing aids.

READING BETWEEN THE LIONS: EXPLAINING CONTINUOUS NARRATIVE IN THE LION HUNT RELIEFS FROM THE PALACE OF ASHURBANIPAL

Joseph Sbar

Mentor(s): Jon Frey (Art and Art History)

This presentation critically examines a scene from the Lion Hunt Reliefs, a series of seventh century BCE panels from the Royal Palace of King Ashurbanipal at Nineveh. In this scene, three lions emerge from a cage and into a hunting enclosure so the King may kill them for sport. At first glance, it appears that three different lions are released separately. However, through an examination of the social and political structures of the Assyrian civilization as well as the stylistic conventions of Assyrian art, including the concepts of multitude, three dimensionality, posture, and morphology, I argue that these three lions are, in reality, a single lion sculpted in continuous narrative. As a militaristic society, the Assyrians encouraged subservience and social stratification in part by the use of art as a propaganda tool. Much of the artwork from the Assyrian empire serves as a reminder that non-Assyrians were beastly and sub-human while Assyrians were superior- but disloyalty could result in torture or mutilation by their powerful king. Thus, I assert that the reliefs themselves are a sensationalized depiction of the King's power and the lions are symbolic of the King's enemies. Lastly, I examine evidence for alternative conclusions and suggest ideas for future research.

PECTIC GELS AS AN EXPRESSION OF FUSARIUM HEAD BLIGHT RESISTANCE IN WHEAT

Kelsey Schlee

Mentor(s): Janet Lewis (Crop and Soil Sciences)

Fusarium head blight (FHB), caused by the fungal pathogen *Fusarium graminearum*, is a major disease of wheat (*Triticum aestivum*) worldwide. *F. graminearum* infects the wheat spike during anthesis, and spreads within the spike through the rachis. This experiment was designed to investigate the role of pectic gels in restricting the spread of the fungus within the wheat spike. Our hypothesis is that pectic gels are localized in the xylem of the rachis by the plant as a mechanism to inhibit the spread of the pathogen. Pectic gels were observed within the rachis by staining fresh cross-sections of the rachis with ruthenium red dye (which stains specifically for pectin). Our specific objectives for this study were to 1) confirm if the pectic gels are localized in the xylem as a response to the infection, 2) conduct a preliminary investigation of the correlation of the presence of the pectic gels with the restricted spread of the fungus. To address these objectives (respectively), 1) inoculated and non-inoculated spikes were compared for the presence of pectic gels, and 2) wheat genotypes with varying levels of resistance to FHB were inoculated and inspected for pectic gel occurrence and location. Although pectic gels in the xylem were not limited to inoculated plants, their frequency was greatly increased following infection. The preliminary investigation to determine if a correlation exists between the presence of the pectic gels and a restricted spread of the fungus were inconclusive.

SPEED MATTERS PASSENGER EXPERIENCE AND INTENTION OF USE OF PUBLIC VS PRIVATE TRANSPORTATION

Emily Schneider

Mentor(s): Constantinos Coursaris (Telecom, Information Studies & Media)

For as long as American cities have provided public transportation, there has been a quest to make those systems as efficient and attractive to travelers as possible. Many studies have been done to measure the usability of bus systems and to discover why so many people still choose use their personal vehicles, polluting the environment with \$3.00 per gallon gasoline. The truth is that there are many reasons why people prefer their cars. A person's choice can often be affected by such variables as cost and convenience. However, one of the most influential variables appears to be the speed of transportation. (Kennedy, 2002) People likely know that their cars are more costly and bad for the environment. However, the increased time spent in transit on public transportation cannot outweigh the benefits for many travelers. (Van Vugt & Van Lange, 1996) Unfortunately, there does not seem to be any practical way to make public transportation run as quickly as private transportation. However, most people are willing to add a little increased travel time for the benefit of saving the environment and their wallets. The question we do not know the answer to is just how much time travelers are willing to allow. This is not a question of whether faster travel times will make people more likely to take the bus. We already know the answer to that. The question here is exactly how competitive public transportation has to be.

EXPLORING THE MICHIGAN STATE UNIVERSITY ISRAELITE SAMARITAN SCROLL COLLECTION: TRANSCULTURATION AND THE INTERNATIONAL SUNDAY SCHOOL CONVENTIONS

Doug Schraufnagle

Mentor(s): Bill Hart-Davidson (Writing, Rhetoric, and American Cultures)

Working with a digitized text sample from the collection of sacred Israelite Samaritan texts held by MSU Libraries Special Collections, WIDE will design and evaluate a proof-of-concept social-networking system available on the World Wide Web by July 30, 2009. The aim of the project is to bring together two distinct groups of users - textual scholars and Israelite Samaritan community members - both of whom have a significant stake in the cultural and scholarly value of the Samaritan Archive. We will do this via the creation of an online environment in which they can view and interpret the Samaritan texts, interact with members of their respective communities, and interact with one another. However, my individual research is related to the nature of the acquisition of these Scrolls. E. K. Warren, a prominent Michigan businessman and philanthropist, came into possession of these ancient documents in his expansive travels throughout the world. Yet it was his high level of involvement in the International Sunday School Conventions that produced a very interesting portion of the history of these documents. Drawing on the theory of transculturation by Mary Louise Pratt, I will explore the traditions and practices of the International Sunday School Conventions as they relate to imperialism around the turn of the century. This research will illuminate a specific history in the complex relationship between the "advanced" Western world and the environments it affected during an era of colonialism and imperialism.

DO MEANINGFUL MATCHES PROMOTE NUMBER DEVELOPMENT?: ONE-TO-ONE CORRESPONDENCE WITH SIMULATED DISTRIBUTED OBJECTS

Noel Schroeder

Mentor(s): Kelly Mix (CEPSE)

Children engage in spontaneous one-to-one activities in their play beginning at a young age; the first such activity to arise is distributing objects (Mix, 2002). One-to-one correspondence is a foundation for number development, on which counting, ordinality and numerosity can be developed. Children's experiences with one-to-one activities may therefore relate to and support the development of number concepts. The present study tested whether children performed better on a number matching task when the task simulated distributed objects. Results show that 24- to 32-month-old children performed better on a task matching simulated distributed objects compared to a task matching identical dots. Distributing objects, therefore, may represent a bridge between spontaneous play and performance on numerical tasks.

SIDESHOW

Nick Schultz

Mentor(s): Robert Albers (Telecommunication)

Sideshow combines adventure with sketch comedy. Sideshow is one of the MSU Telecasters three shows, run entirely by students. Sideshow produces two episodes a semester, which air on RHA TV.

WIND POWER

James Semivan

Mentor(s): Amol Pavangadkar (Journalism)

Michigan is an excellent candidate for wind farm and wind farm production. This Documentary will bring an understanding of this enormously beneficial alternative energy option. Facts will be presented as well as interviews with local and state officials and experts.

AN EXPLORATION OF MARRIAGE PRACTICES AMONG COLLEGE WOMEN IN INDIA

Jamie Servoss

Mentor(s): Marya Sosulski (Social Work)

This project was done during my study abroad trip to India during the Spring of 2008. I conducted interviews with women at the local college I stayed at while in New Delhi. The project explores the views and ideals of the Indian women. Specifically, it takes a deeper look into arranged vs. "love" marriages and the societal expectations that surround each of them.

PEMPHIGUS VULGARIS DIFFERS AMONG MALES AND FEMALES

Jay Shah, Liza Gill

Mentor(s): Animesh Sinha (Division of Dermatology and Cutaneous Sciences)

Pemphigus vulgaris (PV) is a chronic autoimmune blistering disorder of the skin. Like in many autoimmune diseases, a female predominance in PV is well established. The genetic and physiological basis for this gender bias is not well understood. Moreover, it is unclear whether disease profiles differ between males and females in terms of defined clinical parameters. To address this issue, we performed a comprehensive analysis of clinical disease among primarily Caucasian and Ashkenazi Jewish PV patients (n=123) and matched controls (n=105). We compared multiple constant (age of disease onset, HLA-DR, -DQ, and -E type, family history of autoimmunity) and variable (lesion morphology, anti-desmoglein (Dsg) 1 and 3 autoantibody levels) clinical parameters between male and female PV patients and healthy controls. Statistical estimates were determined via Cochran Mantel Hanzel Chi squares and logistical regression. We report that patients diagnosed under the age of 30 (p=0.0392) and 40 (p=0.0829) tended to be male. Males diagnosed under the age of 40 were more likely to have a family history of autoimmune disease (p=0.0455), present with mucocutaneous lesions (p=0.0343), and test positive for anti-Dsg 3 autoantibodies (p=0.0387) when compared to matched female PV patients. Variable and gender specific disease presentation supports a multifactorial description of autoimmune susceptibility.

SUMOYLATION ON THE CATALYTIC DOMAIN OF SERTHR KINASES IN SACCHAROMYCES CEREVISIAE

Asra Shaik

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

We are studying the extent of SUMOylation, a ubiquitous post-translational modification, on protein expression in the catalytic domain of saccharomyces cerevisiae kinases. The catalytic domain is the common master regulation of Ser/Thr kinases, because there is a SUMO consensus found in 60 percent of human and yeast Ser/Thr kinases. We first determined the effects of SUMOylation using a proteomic survey of yeast Ser/Thr kinases with adult strains, but after noticing that SUMO is degraded post-development, we adopted a new method. We moved to use ULP1 and ULP2-modified strains to selectively grow in a Gal-medium to essentially freeze development and therefore determine a more accurate measure of the extent of SUMOylation.

SHEDDING AND PERSISTENCE OF VIRAL HEMORRHAGIC SEPTICEMIA VIRUS IN SURVIVING FISH

Megan Shavaliar

Mentor(s): Mohamed Faisal (Pathobiology and Diagnostic Investigation, Fisheries and Wildlife)

Viral Hemorrhagic Septicemia Virus (VHSV), the most pathogenic fish virus, has recently invaded the Great Lakes watershed leaving behind a trail of devastating fish kills. The reservoir of infection and vector of transmission of this deadly virus are currently unknown. Such information is needed in order to develop sound management strategies to control the spread of the disease. Field observation and laboratory studies have shown that some fish can survive and fully recover from a VHSV infection. This study was therefore undertaken to determine if the virus survives in the tissues of surviving fish and thereby constitute a reservoir of VHSV. The present study showed a difference among fish species in terms of persistence of the virus in recovered animals. While brown trout (*Salmo trutta*), brook trout (*Salvelinus fontinalis*), and lake trout (*Salvelinus namaycush*) were able to totally clear the virus from their tissues, coho salmon (*Oncorhynchus kisutch*) harbored VHSV for up to nine months postinfection. VHSV was reisolated from coho salmon using the Epithelioma Papilloma of carp (EPC) cell line and confirmed with the polymerase chain reaction (PCR) assay. This finding shed light on the important role played by surviving fish in maintaining the virus in the environment. The coho salmon is a migratory fish whose life cycle alternates between Lake Michigan and inland streams and therefore can contribute to the spread of VHSV within the Great Lakes basin.

FUNCTIONAL STUDIES OF C-KIT MUTATIONS OBSERVED IN CANINE MAST CELL TUMORS

Kelly Shaw

Mentor(s): Vilma Yuzbasiyan-Gurkan (Microbiology and Molecular Genetics and Small Animal Clinical Sciences)

Mast cell tumors (MCTs) are the most common form of skin tumor found in dogs. Our previous studies have shown that MCTs display a range of mutations, and that MCTs with mutations in the c-KIT gene are associated with poor prognosis. While the mutations are thought to be activating mutations, few have been characterized in detail. Mutations identified in our lab range from deletions to tandem repeats of DNA in the juxtamembrane domain of c-KIT. The objective of this experiment is to test the hypothesis that these mutations, one duplication and one deletion mutation, are the critical factors in driving tumorigenesis. We have elected to utilize an ectopic expression study of normal and mutant c-KIT genes in primary canine fibroblasts to test this hypothesis. Normal fibroblasts do not express c-KIT, so any change in phenotype can be attributed to the introduction and subsequent expression of the mutated c-KIT gene. Towards this end, we have generated expression constructs of mutant and normal c-KIT and established stable transfectants of primary canine fibroblasts with them. Preliminary studies have shown that with expression of either the c-KIT deletion or duplication mutant, cells have a prolonged life span of over 1 year, whereas normal primary cells senesce and die within a few weeks. Additional tumor phenotypes are being assessed and include growth in soft agar, anchorage-independent growth, invasion and proliferation capacity. These studies are ongoing.

USING FORWARD AND REVERSE GENETIC APPROACHES TO IDENTIFY PLASTID DIVISION COMPONENTS

John Sherbeck, Afiqah Ahmad Hisham

Mentor(s): Kathy Osteryoung (Plant Biology)

Chloroplasts are organelles that replicate through binary fission, similar to many bacteria. The ancestors of chloroplasts were intracellular photosynthetic prokaryotes that inhabited a primitive protozoan host. Interestingly, some of the components of the plastid division apparatus are derived directly from the cyanobacterial divisome, but others are post-endosymbiotic inventions of eukaryotic origin. While several constituents of the plastid division machinery have been rigorously characterized in recent years, extant data suggests that a few key factors remain unidentified. We are currently attempting to identify new plastid division genes through a forward genetic screen, utilizing lines treated with ethyl methanesulfonate (EMS). In addition, we are employing reverse genetic approaches to analyze candidate loci, selecting candidates based on their expressional correlation to known plastid division genes. While analysis of candidate T-DNA insertion lines in our reverse genetic pipeline has not revealed any novel division genes, a total of eight unique mutants have been identified through our forward genetic pipeline. These mutants have marked alterations in chloroplast number and typically possess organelle shape defects. We have named these mutants can1-can8 (chloroplasts altered in number), in order of their discovery. With the exception of can1, all can mutants exhibit cells with enlarged and less numerous chloroplasts relative to wild-type. Our initial results suggest that we have isolated informative alleles of known plastid division genes and promise potential for the identification of novel factors.

GENETIC MAPPING OF A GENE CONTROLLING FLOWERING IN PLANTS

Angela Shrestha

Mentor(s): Steve Vannocker (Horticulture)

The objective of this research is to identify a gene, designated VIP7, that acts as a master regulator of flowering in the plant *Arabidopsis thaliana*. Previous researchers mapped this gene to a region of the genome containing 80 known genes. We are trying to determine which of these is VIP7. Wild-type *Arabidopsis* require exposure to near-freezing temperatures (vernalization) to flower. The vernalization independence (vip) class of mutants flower without cold. Additional known VIP loci encode plant counterparts of proteins from yeast that function in transcription by promoting elongation and histone H3 lysine-4 methylation, a modification to nucleosomes that enhances RNA polymerase recruitment. To locate candidate genes, we identified genes showing significant sequence homology with yeast genes that function in transcriptional elongation or histone methylation. We assessed the degree of co-expression between genes in the mapped interval with known VIP genes. Twelve of these were found to have statistically significant ($p < 0.01$) correlations with one or more VIP genes. Only two genes were identified through both approaches. One of these genes was targeted for reversed genetics analysis. We analyzed plants carrying a mutation that disrupts the promoter and found that these showed normal flowering. In addition, no large defects were detected in this gene in the vip7 mutant. Finally, we found that the RNA for this gene was expressed at normal levels in the vip7 mutant background. Although this preliminary data suggests this gene is not VIP7, we are carrying out additional experiments to further test this.

A COMPARISON OF THE GENETIC DIVERSITY OF THE LYME DISEASE PATHOGEN, BORRELIA BURGDORFERI, FROM ENDEMIC AND RECENTLY-INVASED BLACKLEGGED TICK POPULATIONS IN MICHIGAN

Jennifer Sidge

Mentor(s): Jean Tsao (Fisheries and Wildlife)

Lyme disease (LD), a tick-borne illness caused by the bacterium *Borrelia burgdorferi* and transmitted by the blacklegged tick *Ixodes scapularis*, is the leading vector-borne disease in the United States, causing significant human and canine illness in the northeastern and north central states where the tick is endemic. In Michigan, the blacklegged tick comprises two distinct populations: an endemic population in the Upper Peninsula, where ticks and the bacterium have been cycling for at least 20 years, and an invading population in the southwestern Lower Peninsula, where ticks have been increasing in range and density over the past seven years. The objective of this study was to characterize and compare genetic variation of *B. burgdorferi* between the endemic and invading zones in Michigan. I hypothesize that greater *B. burgdorferi* strain diversity will be found at the endemic site due to a larger population size and longer duration of establishment, allowing for accumulation of mutations. I will characterize and compare strain diversity using the 16S-23S rRNA intergenic spacer region of *B. burgdorferi* amplified from ticks and mammals using phylogenetic analyses. Examining the genetic diversity of *B. burgdorferi* from these locations with different histories of tick establishment will assist in better understanding the invasion of the LD tick and pathogen, and thus provide an indication of the potential Lyme disease risk in our state.

CHARACTERIZATION OF THE GUN201 GENE FAMILY, A NOVEL DOMAIN INVOLVED IN PLASTID SIGNALING IN ARABIDOPSIS THALIANA

Christopher Sinkler

Mentor(s): Robert Larkin (Biochemistry & Molecular Biology)

In plants, chloroplasts are derived from nonphotosynthetic proplastids during the development of photosynthetic organs such as cotyledons and leaves. After biogenesis, chloroplasts proliferate by fission. The transition from heterotrophic to photoautotrophic growth that occurs after germination depends on successful chloroplast biogenesis. Because the proteins that carry out chloroplast assembly and function are encoded by both the nuclear and plastid genomes, chloroplast biogenesis requires the coordinated expression of nuclear and chloroplast genomes. Plastid-to-nucleus signaling helps coordinate the expression of the nuclear and plastidic genomes with the developmental state of the plastid during chloroplast biogenesis. Here we

report the isolation of a new genomes uncoupled (gun) mutant, gun201, that is defective in plastid-to-nucleus signaling. Additionally, gun201 greens in response to light better than the wild type; this finding is consistent with GUN201 participating in chloroplast biogenesis. GUN201 encodes a tetratricopeptide repeat (TPR) domain protein that is a member of a small gene family. Single, double and triple mutants that are deficient in one or more members of the GUN201 gene family were analyzed to determine the functions of the GUN201 gene family members. One of the family members, gun-related gene 3 (GUR3), is functionally redundant with GUN201 in plastid to nucleus signaling. The gun201 gur1 double mutant does not green as well as the wild type, possibly suggesting a role of the GUN201 gene family in chloroplast biogenesis. Further characterization of the GUN201 gene family will provide insight into the mechanisms that control chloroplast assembly and function.

CLONAL DIVERSITY OF BURKHOLDERIA CEPACIA COMPLEX FROM CLINICAL AND ENVIRONMENTAL SOURCES

Jacob Sinkoff

Mentor(s): Amber Springman (Pediatrics and Human Development)

The Burkholderia Cepacia Complex (BCC) is a gram-negative bacilli. BCC is known to colonize soil, plant rhizospheres, onions, nematodes, and lungs of cystic fibrosis patients. Evolutionary genotyping was performed, on environmental and clinical CF cultures, to study evolutionary relationships of BCC. Multi-locus sequence typing (MLST) was performed on seven housekeeping genes to characterize the bacterium into sequence types. Sequence types were determined from the allelic profiles of seven housekeeping genes: atpD, gltB, gyrB, recA, lepA, phaC, and trpB. Phylogenetic trees show distinct evolutionary relationships between environmental and clinical samples.

THE SYMBOLIC AND REALISTIC POSSIBILITIES OF BARACK OBAMA'S PRESIDENCY

Robert Siporin

Mentor(s): Pero Dagbovie (History)

When Barack Obama became the 44th President of the United States, he took on the immense burdens which come with being the first African American elected to the office. The problem discussed in this paper is the powerful conflict between Obama as a symbolic figure of change and as a President who can make significant improvements to the Black community. Such examination gives a reasoned explanation to Obama's possible limitations and possibilities as President, and represents an important attempt compare his possibilities to former policy leaders and initiatives of the past. Such analysis required that Obama's speeches, bestselling books, biographies and contemporary scholars' works be considered in order to analytically decide whether he could be a real bastion of change for the Black community, or if his most effective contribution to Black interests will be getting elected President. Careful consideration shows that Obama is limited as President to make progressive improvements for the Black community. His symbolic status as a progressive President limits his realistic capabilities. Such findings directly question the hopes that many put on Obama's candidacy. It calls for a re-examination of how Obama is portrayed and what he can actually do for the American people as well as the Black community over the next four years in office.

NPR COVERAGE OF THE 2008 PRESIDENTIAL ELECTION

Kristin Skaggs

Mentor(s): Geri Zeldes (Journalism)

This project involved tracking every story about the presidential election on NPR between Labor Day and election day. We conducted a qualitative analysis of themes to determine which candidate received more coverage and determined patterns of coverage. We also determined what topics were covered most often. In order to obtain these results, we searched NPR archives and recorded each story, coding for topics and which candidate got more coverage in the story.

3-D COMPUTER-BASED MODEL OF AN ARCHAEOLOGICAL SITE ON THE ISLAND OF CRETE

Josephine Slavsky

Mentor(s): Jon Frey (art and Art History)

In the summer of 2008, a team of archaeologists from MSU, Temple University and the American School of Classical Studies at Athens used three-dimensional laser scanning technology to map the interior of Skoteino Cave on the island of Crete off the coast of Greece. This poster presents the results of an effort to edit and apply color to the registered point-cloud data using photographs taken at the same time as the initial data collection. Many of the images used in this process required modification in order to render the colors of the interior of the cave and produce a more realistic model. Due to the limited light within the cave, many points were assigned no color value at all and therefore had to be deleted from the original model. As the results show, the model created through this difficult and time-consuming process is a much more accurate representation of the interior of the cave than the original model.

PERCEPTIONS AND REALITIES OF THE THREAT OF COUGARS AMONG HUMANS

Julia Smith

Mentor(s): Marcella Kelly (Virginia Polytechnic Institute and State University)

We are more inclined to coexist peacefully with and thus conserve a species if we perceive it positively. Human perception is absolutely vital for a species' survival. Is the species feared? Is it seen as destructive? Do its interests conflict with those of humans? Or is the species revered as a symbol of wildness? Is it seen as a sign of a healthy ecosystem? Do people feel morally compelled to protect this species? If a species is to be conserved, it must be viewed positively by the public; otherwise, conservation or reintroduction efforts will surely fail and so will the species. The issue of coexistence of cougars (*Puma concolor*) and humans is increasingly important as both human and cougar populations grow and cougars push eastward in the United States. Cougar conservation and management is multidimensional and requires not only a significant understanding of cougar biology but also of factors influencing conflict between cougars and humans. More studies quantifying the impact of livestock depredation by cougars and public attitude surveys toward cougars must be completed in preparation for making future wildlife management decisions if cougars are to make a successful comeback. This review assesses the real versus perceived risk of cougars to humans and livestock and the implications of human attitudes toward cougars for conservation efforts.

EFFECTS OF MOBILIZATION EXERCISES ON HORSES RANGE OF MOTION OVER A 3-MONTH PERIOD

Kelly Smith, Emma Hill

Mentor(s): Narelle Stubbs (Large Animal Clinical Sciences)

Adequate range of motion (ROM) of the back is crucial for equine locomotion and performance. Clinically, physical therapy mobilization exercises to increase ROM, assist rehabilitation of musculoskeletal injuries and enhance performance. The study's aim is to examine changes in ROM of the vertebral

column using mobilization exercises designed to increase flexibility of the musculoskeletal system. We hypothesize that all horses will increase ROM, individual increases will vary, and the greatest change will be during the first 4 weeks. Nine horses performed ten exercises to the end of their ROM extending into dorsoventral flexion-extension, lateral flexion, and rotation. These were repeated five times a day, five days a week. Three data collections were performed: Wks 1,4,8. Data collection and analysis was done via motion analysis technology, and MatLab programming. Each horse was fixed with 48 body markers, which are detected by infrared cameras. These are tracked for accuracy and overall changes in ROM. The horses were limited to conditions similar to stall-rest during the three-month period. The preliminary results show that all horses demonstrated increases in ROM after three months, with the most pronounced increase in the first 4 weeks. The variance among individual increases is high, highlighting other factors that may be contributing to the horses' overall ROM, such as inherent musculoskeletal limitations. ROM gains and individuality may prove useful for future studies, and the development of specific treatment strategies during rehabilitation from injury and/or performance enhancement.

COMPARISON OF K^+ , Na^+ AND Ca^{2+} CURRENT DENSITY IN DORSAL ROOT GANGLIA NEURONS FROM MREN2(27) HYPERTENSIVE AND CONTROL RATS

SungMo Son

Mentor(s): Azeez Aileru (Biomedical Research Infrastructure Center & Physiology and Pharmacology), Manju Bhat (Life Sciences & Project Strengthen), Jeffrey Overholt (Life Sciences)

Hypertension is disturbingly higher in minorities and more likely to die from associated stroke and heart disease. Studies have indicated a genetic origin, but relatively little is known about the underlying causes. Neurons of the dorsal root ganglia (DRG) have been shown to be involved in the control of blood pressure. The purpose of this study was to compare current density in DRG neurons from control and genetically hypertensive mRen27 rats using whole-cell patch clamp of isolated neurons. Currents were elicited by 100 ms voltage steps from -50mV to +70 mV in 10mV increments (HP-85). Average cell size was 46 ± 10 pF and 55 ± 10 pF for control and mRen27 neurons. K^+ current density elicited by a step to +20 mV averaged 208 ± 46 and 236 ± 70 pA/pF in control and mRen neurons. Na^+ current density elicited by a step to -20 mV averaged -325 ± 75 and -239 ± 73 pA/pF. Ca^{2+} current density elicited by a step to -10 mV averaged -123 ± 32 and -87 ± 27 pA/pF in control and mRen neurons. While there was a tendency for decreased Na^+ and Ca^{2+} current in mRens, there was no significant difference in the density of any current tested at any membrane potential (unpaired t-test, $p > 0.05$). These data suggest that differences in current density in DRG neurons do not contribute to the hypertension in mRen27s. Future studies will look at neurons in other ganglia, such as the SCG; and regulation of electrical activity in SCG and DRG neurons by neurotransmitters involved in hypertension, such as angiotensin II.

MEANTIME

Stephanie Sparks, Joshua Barnett, Rachel Hartman, Thomas Reilly-King

Mentor(s): Bob Albers (Telecommunication, Information Studies and Media), Steve Rachman (English)

Meantime is a 10 minute documentary film that takes a quick look at the story of a working class man, Joe Thompson, who is also the lead singer for a heavy metal band called Meantime. It showcases his passion for the music as he works to make a living as a bartender in a small pub in London. The 4 band members of Meantime continue to play the niche music despite their economic struggles because they love it, and that devotion comes across during their performance at The Unicorn pub. They discuss why they chose heavy metal and the audience takes a brief look at what Joe has to do to continue to do something he is so passionate for.

COCKNEY RHYMING SLANG

Stephanie Sparks, Joshua Barnett, Gregg Gaddy, Rachel Hartman

Mentor(s): Bob Albers (Telecommunication, Information Studies and Media), Steve Rachman (English)

This is a 60 second documentary film on an old time jargon still used today in London by a select few. The language is creative, unique, and many times humorous. This was filmed while on the Film in Britain Study Abroad program in London during the summer of 2008.

INTERFACE DESIGN AND THE USABILITY OF GPS DEVICES

Miranda Sperry

Mentor(s): Constantinos Coursaris (Telecom, Information Studies & Media)

As GPS devices become increasingly popular in modern day society, designers of these devices must acknowledge the usability of their creations in order to ensure maximum convenience and efficiency in consumer use. The goal of this project is to discover how interface design in relation to screen size and button location affects the usability of GPS devices. The experimental design of this project involves 25 participants, ranging from 25-35, all with at least 7 years of driving experience. The actual experiment will consist of three main parts; introduction to the GPS devices, completion of the main experiment, and collection of input. Factors such as arrival time and amount of time spent looking at the GPS device will be taken into account and recorded for every trial completed by each participant in the second part of the experiment. After every participant has completed each part of the experiment, their comments and opinions of the different combination of GPS design will be recorded for future reference by way of either personal interviews or surveys. Hypotheses for this experiment are that the larger the screen size and the further the buttons from the screen, the greater the satisfaction and accuracy of using the GPS device. Hopefully, GPS designers can use this research to improve the usability of their products and thereby achieve higher amounts of satisfaction from their consumers.

HEALTH BEHAVIORS AND WOMEN: THE IMPACT OF EDUCATION ON CERVICAL CANCER SCREENINGS

Sandte Stanley

Mentor(s): Joseph Cesario (Psychology)

There are many determinants of health that are clear (or vague) indicators of whether or not women will participate in or seek out disease prevention behaviors, such as Pap screenings for cervical cancer. Education has been found to be a critical factor in making that decision. In spite of cervical cancer being a preventable disease, an estimated 11,070 new cases and 3870 deaths have been reported in 2008 (National Cancer Institute, 2008). The demographics that make up the new cases and deaths of 2008 statistics reflect that education may have played a critical factor in their diagnosis or a possible lack of prevention efforts. This study used a questionnaire to assess the beliefs, motivation levels, health related knowledge and education that undergraduates and non-undergraduate college aged women have in regards to Pap screenings. Undergraduates and non-undergraduate college aged women were used in within the population. These two variables were examined in an effort to see what differences exist that impact screening behaviors of women at varying education levels.

SOCIAL EXCLUSION AND SOCIAL DILEMMAS

Adam Stivers

Mentor(s): Norbert Kerr (Psychology)

The following study examines the relationship between the threat of social exclusion and cooperativeness in a group setting for individuals with different social value orientations. In a game inspired by the prisoner's dilemma, participants are asked to allocate chips between personal savings and a group fund shared with a partner. To induce the threat of social exclusion (or affirmation of social inclusion) the participants are potentially given feedback for each trial in the form of a happy or angry face. Rational behavior predicted by economic theory suggests that individuals will allocate chips based on their self interest to accumulate the most chips possible. In this experiment, I introduce social exclusion as a potential factor that may cause participants to settle for less chips in order to ensure the approval of their partner. Because the feedback is independent of the partner's contributions, the participants should not view social approval as a means to acquire more chips. The important questions are whether the feedback induces more cooperative behavior, what type of feedback produces the most cooperative behavior (rewards, punishments, or both rewards and punishments), and whether people who cooperate more tend to be more prosocial or proself.

PIN-UP ART FROM THE 1940'S AND 50'S

Jennifer Strack

Mentor(s): Louise Siddons (Art & Art History)

The subject of my research is analyzing the history of pin-up Art from the 1940's and 50's in context with the stereoviews of artist Rachel Heath. The focus of my supervising Professor research analyzes the self-portrait photography of Rachel Heath. Heath constructs herself in the images similarly to the ways in which the models of pin-up art are posed. My research will be looking to draw the correlation between Heath's auto erotica series with the subjects and artists of 40's and 50's pin-ups. In addition to the basic overview I hope to gain of the history of this pin-up art work, a sample of the questions I will answer: What are the conventions of pin-up photography? Where do we see them in Heath's images? And where does she diverge from them?

MAMMALIAN SKULL DEVELOPMENT

Alexander Strauch, Gannon Curtis

Mentor(s): Kay E Holekamp (Zoology)

Throughout the Fall semester of 2008, students enrolled in the undergraduate research seminar 200 honors section met twice a week to discuss and do research on different mammals. We did all of our research at the MSU museum and used the museum specimens to collect our data. We cataloged, organized, took measurements, photographed, and photoshopped lots of skulls from different mammals like minks, meerkats, polar bears, wolves, etc. We noted the age/ developmental stages of the animals and saw how it affected the morphology of the skulls as the animals grew.

CHANGES IN LAKE PRODUCTIVITY THROUGH SEDIMENT CHRONOLOGIES

David Stringer

Mentor(s): David Long (Geological Sciences)

Human activity has increased the flow of nutrients to watersheds, and there is concern about how increased nutrients have impacted biogeochemical cycles and changes in trophic status in aquatic ecosystems. Sediment cores were collected from three inland lakes (Mullet, Torch, Shupac) in Michigan to examine temporal changes in indicators of lake productivity. The hypothesis driving this work is that increased nutrients have increased lake productivities. Because increased photosynthesis is associated with increased production, it is expected that increased productivity in the lakes would correspond with an increase in the calcium and phosphorus concentrations in the sediments to the present. Sediment cores and vertical profiles of porewater were collected and sectioned. Elemental concentrations (including Ca and P) were analyzed via ICPMS-HEX. Results showed the temporal trends to the present indicated 1) Ca and P concentrations increased in Mullet Lake, corresponding with the hypothesis, 2) Ca increased and P decreased in Torch Lake, and 3) Ca decreased and P increased in Shupac Lake, both of which are inconsistent with the hypothesis. The trends in Torch and Shupac lakes are interpreted to be the result of 1) differences in the relative abundances of the chemicals where one might be limiting, 2) differences in the soil/bedrock of the watersheds, and 3) early diagenesis causing the dissolution of calcite. This investigation reveals that historical changes in lake productivity through sediment chronologies are best understood in light of landscape and in-lake processes using a multi-elemental approach.

ENGINEERING IMPROVED TRP REPRESSOR PROTEIN CRYSTAL CONTACTS USING GENE SYNTHESIS

Ryan Sullivan

Mentor(s): Dennis Arvidson (Microbiology)

Protein crystallization is the "gold standard" for protein structure determination. However, many proteins have proven to be difficult to crystallize. Approaches such as surface entropy reduction have been developed in an attempt to overcome this difficulty. In some cases where a protein structure has been solved by x-ray crystallography it remains desirable to improve crystal contacts in order to improve resolution or to facilitate structural work on mutant proteins. Crystal contact engineering refers to the process whereby each contact point made by a protein in a crystal is examined with the goal of rationally designing improved contacts. We present here our progress in engineering such changes for E. coli Trp repressor (TrpR). We wish to examine the structure and function of many mutant TrpR proteins. To do this efficiently we have designed and constructed an expression plasmid that allows us to efficiently purify the protein using an affinity-tag and to later completely remove the tag. We are currently using gene synthesis to construct de novo TrpR variants with multiple changes designed to improve crystal contacts. The engineered trpR genes will be tested in vivo for any changes in function. Our goal is to develop a recombinant TrpR construct that will robustly crystallize without loss or change of function.

RELATIONSHIP FORMATION IN COLLEGE DATING: A LOOK AT THE EFFECTS OF LOVE ATTITUDES, SOCIAL NETWORKS, ORGANIZATIONAL NETWORKS, ONLINE NETWORKS, FWBRs, AND CHANCE ENCOUNTERS

Chadwick Sutton

Mentor(s): Kelly Morrison (Communication)

As communication research has grown, a considerable amount of attention has been focused on romantic relationships. However, most of this research is based off of relationships that have already been formed and we have limited information about how and why these relationships are formed. This study looks at the factors of love attitudes, social networks, organizational networks, on-line networks, friends with benefits relationships (FWBRs), and chance encounters; to determine what correlation each factor has on how people develop relational interest. The two main goals of this study are to 1) determine how love attitudes and the various networks influence human interaction at the beginning of relationship formation; and 2) determine what

motivations or characteristics lead people to form relational interests and how love attitudes might affect these findings. This study is largely an exploratory study that seeks to combine existing communication research and tap into a new area of human interaction.

CHILD AND ADULT USE OF PROSODY IN SYNTACTIC DISAMBIGUATION

Megan Sutton, Karl DeVries, Thao Dinh, Braden Leinbach

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

Adults constantly use prosodic information in speech (such as pitch, intonation, and pauses between words) to identify the correct meaning of syntactically ambiguous phrases. Although children have been shown to be capable of using prosody in some aspects of speech, such as identifying word boundaries and segmenting the speech stream, previous research has shown mixed results of children's prosodic abilities in cases of syntactic ambiguity. Our study is composed of three experiments, each with specific goals to help determine the differences in how children and adults identify and use prosodic information in speech. The adult production experiment, where a visual prompt of an ambiguous sentence and a picture cue of the intended meaning is used to elicit disambiguating prosodic cues from naïve speakers, seeks to determine whether naïve speakers are able to identify a structure as potentially ambiguous and appropriately use varying intonation and pauses to make the intended meaning clear. The child perception experiment, where a (structurally ambiguous) recorded command is used to prompt children to choose a particular set of items from an array (relying on prosodic information of the command to choose the correct set), is designed to determine whether or not children are able to utilize prosodic information in a phrase to disambiguate syntactic structures therein. The adult perception experiment, with the same setup as the child perception experiment, attempts to comparatively show that adults are in fact able to utilize the same prosodic cues to disambiguate these syntactic structures.

OPTIMIZING THE FABRICATION OF HYDROXYAPATITE CERAMIC TISSUE SCAFFOLDS

Ashley Swartz

Mentor(s): Melissa Baumann (Chemical Engineering and Materials Science)

The demand for synthetic bone substitutes continues to drive bioceramics research. Hydroxyapatite (HA), $\text{Ca}_{10}(\text{PO}_4)_6\text{OH}_2$, is the primary inorganic material in bone, and consequently has excellent biocompatibility. One project our lab group investigates is the biological effects of microcracking densified HA tissue scaffolds fabricated from commercially available nano and micron powders. To eliminate porosity as a variable and prevent surface interconnected porosity, the micron and nano sample densities must be similar. Ideally surface interconnected porosity of the densified discs must be minimized in order to prevent leakage of cell culture media during cell studies. During pilot fabrication of the dense HA samples, the nano samples consistently obtained lower theoretical densities (~88% theoretical) compared to the micron samples. The goal of this study was to increase the density of the nano samples in order to obtain similar theoretical densities between the two types of HA tissue scaffolds. The processing techniques used to fabricate the HA tissue scaffolds included mechanical compaction and pressureless sintering in air. Mechanical compaction techniques included uniaxial pressing and Cold Isostatic Pressing (CIP) of nano powders. Although improved green strength and improved powder flow are obtained with the use of binders and spray drying, possible contamination issues may arise effecting biocompatibility. Therefore relatively pure, binderless HA powders were selected for this study. The addition of secondary pressing with a CIP and the use of an insulating powder bed during sintering increased the density of the nano powder samples to approximately that of the micron samples (~95% theoretical).

DETERMINING GENES INVOLVED IN SYMBIOSIS OF HETEROHABDITUS BACTERIOPHORA AND PHOTORHABDUS LUMINESCENS

David Sykes

Mentor(s): Todd Ciche (Microbiology & Molecular Genetics)

Heterohabditus bacteriophora is a nematode that serves as a symbiotic host for the bacterium Photorhabdus luminescens. The bacterium is required for the growth and reproduction of the nematode. H. bacteriophora ingests the bacteria which then adheres to the posterior intestine of the nematode and forms a biofilm. It later invades the rectal gland cells which lyse releasing vesicles of bacteria into the pseudocoelom of the nematode. RNA interference (RNAi) is a technique that was found to be an effective mechanism of post transcriptional regulation of gene expression in H. bacteriophora. Introducing exogenous double stranded (dsRNA) into an organism produces small interfering RNA (siRNA) which causes degradation of mRNA and ultimately silences genes. In this study, H. bacteriophora was soaked in dsRNA to identify genes that affect the cell adhesion of P. luminescens in the nematode intestine. Eleven genes were tested using RNAi but did not reveal any observable, abnormal phenotypes in H. bacteriophora. Further investigation of this study could prove useful in elucidating the cellular mechanism of symbiosis and provide a model system of symbiosis for other organisms.

OPEN CHARACTER BUILDER

Ryan Tackett, Erin Brandt

Mentor(s): Dan Marsh (telecom/DMAT)

The Open Character Builder is a custom software interface designed to aid in the creation of animatable CG characters for the computer animated short, "The Open". Computing technology has greatly increased the capabilities of independent animation production in many ways, but the complexity and tedium of animation itself are not resolved by any means. To this end, the researchers sought to create tools which would accelerate the production's pace, without compromising the aesthetics of the production. Due to the short's large number of human characters all modeled in a similar distinct artistic style, the first build of the interface, is intended to expedite the process of developing the variety of unique characters while maintaining the stylistic appearance necessary for the work. Using an existing base character model, the plugin allows an artist to quickly create and customize an infinite number of stylized human characters which match the production's overall design. The base character model is loaded into the interface and may have its attributes adjusted manually for maximum customization, and may then be exported to a separate Maya Binary file from within the same interface. The plugin is implemented in Autodesk Maya, the industry standard in computer animation software for film and visual effects, and programmed in the Python scripting language. The plugin was developed through an iterative process which included multiple programmers adding functionality to a base interface until all desired features were usable within the interface.

THE ESSENCE OF IMAGES

Amanda Tanner, Chelsea Beck, Anna Pathak, Alexandra Siciliano

Mentor(s): Christian Lotz (Philosophy)

Our presentation explores the question of whether Jeff Wall's work should be understood from the perspective of a formalist or postmodern take on art and photography. According to our position, Wall blurs the line between formalism and post-modernism. On one hand, part of Jeff Wall's objective is to present art in its most essential form, a formalist idea. Within the formalist philosophy, a photograph's meaning is intrinsic within itself, which is to say that without context photographs still have meaning. In this way Wall is able to capture meaning through photographing seemingly mundane subjects. "Peas and Sauce" (1999), for example, takes everyday trash and, through the art of photography, transforms it into a thought-provoking image. On the

other hand, another interesting aspect Wall's technique is his ability to fabricate photos in the image of various paintings, literary works, and real-life events. This artistic practice is indicative of a postmodern theory of photographic meaning with an emphasis on intertextuality. Works such as "Picture for Women" (1979), which is Wall's representation of Manet's "A Bar at the Folies-Bergère" is an example of intertextuality. Clearly, Wall is a member of the post-modern school of thought. In our presentation we will demonstrate how the meaning of Wall's photographs are deepened by the combination of formalism and postmodernism.

EFFECTS OF DRESSAGE TRAINING ON PERFORMANCE IN HALT TO TROT AND TROT TO HALT TRANSITIONS

Erin Tans

Mentor(s): Hilary Clayton (Large Animal Clinical Sciences), Sandra Nauwelaerts (Large Animal Clinical Sciences)

Training influences motor control and coordination and may change the way that transitions between gaits are performed. In the competitive sport of dressage, horses perform three distinct gaits: walk, trot and canter. When horses transition between gaits, they may use intermediate steps that are not characteristic of either gait. We hypothesize that intermediate steps taken during transitions will differ between levels of training. Transitions from trot to halt and halt to trot were videotaped in 45 horses performing in three levels of dressage competitions: novice (USDF training level, N=15); intermediate (USDF second level, N=15); and advanced (FEI Grand Prix level, N=15). Footfall timing patterns were analyzed using Dartfish TeamPro software. We measured duty factor and ipsilaterality. Duty factor was the time duration that each hoof was on the ground. Duty factors were lower for advanced levels, indicating a longer aerial phase, a desirable trait in dressage competitions. Ipsilaterality was the time lag between ground contacts of hooves on the same side of each horse. Each stride was categorized based on the combination of all four hooves' ipsilateralities resulting in 11 categories of intermediate steps. We found differences in the occurrence of categories between the different levels of training. Advanced horses, unlike novice horses, performed transitions without walking steps. This indicates that the level of training influences how transitions are performed. More categories were detected in trot to halt transitions and these appear to be a more difficult task than transitioning from halt to trot.

GEOGRAPHIC RACIAL EQUALITY IN OAKLAND COUNTY, MICHIGAN

Marie Tashjian

Mentor(s): Joe Darden (Geography)

This paper examines geographic racial equality between African Americans and Whites in Oakland County, Michigan. I hypothesized that there would not be any geographic racial equality found between these two groups. This paper uses census of population and housing data taken from the 2000 U.S. Bureau of the Census Summary Files 3 and 4. Four indicators, income, educational attainment, occupational status and residential segregation were used to determine whether there was geographic racial equality. To measure residential segregation based on census tracts the index of dissimilarity was used. Comparisons were made between African Americans and whites based on median household income, percent of the population with bachelor degrees or higher and the percent managerial and professional workers. The Study examined 51 municipalities. Of these 51 places, only 3 municipalities were places of geographic racial equality. Thus, the hypothesis was rejected.

SHE AIN'T NOTHIN BUT A HOOCHIE MAMA: THE EFFECT OF POPULAR MUSIC VIDEOS ON THE PERCEPTION OF BLACK WOMEN

Sarah Taylor

Mentor(s): Nicole Buchanan (Psychology)

Since the time of slavery, several stereotyped images of Black women have pervaded popular culture in the United States (Collins, 2000). These stereotypes define Black women as aggressive and hypersexual. They are perpetuated through many forms of popular media, including music videos. Many popular music videos have an abundance of imagery that can be described as misogynistic and degrading. In particular, images of Black women often present them as sexual objects, reminiscent of the Jezebel stereotype instituted during the time of slavery. This study examines if perceptions of Black women are associated with the way in which they are presented in popular media (i.e., positive, negative, neutral, or sexualized representations in music videos). Further, I examine how egalitarian/feminist gender-role attitudes moderate the relationship between media images and perceptions.

MULTIPURPOSE INTERACTIVE SYSTEMS (MIS): USABILITY AND WORKLOAD

Samantha Tazzia

Mentor(s): Constantinos Coursaris (Telecommunications)

In addition to driving, drivers are also concerned with multiple other secondary tasks, tasks in addition to those required to drive. This means that the mental workload of the driver is now a function of the driver's experience with the multiple devices used as well as the ergonomics. Some companies make devices that have been created to increase the usability of individual secondary tasks, but they do not change the fact that the driver still has multiple distractions. BMW, however, came up with a potential method for increasing the usability of all of these tasks together, called the iDrive and is a multipurpose interactive system (MIS). The purpose of this experiment is to test whether the method of using MIS is more usable and safer for drivers than having to complete the tasks individually. It is believed that MIS will decrease driver's distractions when performing secondary tasks and therefore keep the driver safer. This project will first require a questionnaire designed to assess the experience level of the participants. Next there will be a simulated driving course that will be performed in what looks like the cabin of a car, equipped with a steering wheel, pedals, radio, dash board and gear shift. In addition there will be a division between the driver's seat and the researcher's seat to avoid bias. The subjects will take the two driving tests, one with all the tasks separate and the second will use the MIS and their efficiency will be compared.

THE EFFECTS OF TAGLINES ON CLICK-THROUGH RATES: MOBILE ADVERTISING

Samantha Tazzia, Claire Audette-Bauman, Zachary Church, David Elliot

Mentor(s): Constantinos Coursaris (Telecommunications)

Research has shown that the entertainment value of mobile advertisements affect the consumer's attitude toward the advertisement, which affects the click-through rates (CTR). (Newell, Jay, and Morgan Meier. "Desperately seeking opt-in: a field report from a student-led mobile marketing initiative." International Journal of Mobile Marketing 2.2 (2007): 53-57.). Taglines are one of the factors that lead to the entertainment of ads. This study will investigate how the length and communication style, professional versus casual, of the taglines affect the CTR. Professional ads are informative, using proper English. Casual ads are descriptive, using slang. Length is divided into three categories by word count: short ads, one to eight words, medium ads, nine to sixteen words, and long ads, seventeen words and greater. This information will advise businesses on which style of text ad is the most effective. We believe that medium length advertisements will have the greatest CTR because they will provide the right amount of information without being tedious and that casual advertisements will have the greatest CTR because they are more enticing. The study uses a questionnaire involving forty-three questions. Subjects are instructed to choose which advertisement they would click assuming that they were frequent customers of the business. The first six questions are demographic. Then nine questions are comparative asking subjects to choose between two ads that compare length and

communication style. Following each of these questions are three close ended questions assessing the factors of taglines. At the end there is one final open ended question.

THE DARK SIDE OF LIGHT: NIGHTTIME ILLUMINATION DISTURBS THE FUNCTION OF THE BRAIN CLOCK

Ashley Tomczak

Mentor(s): Lily Yan (Psychology)

The benefits of artificial lighting to our society are obvious and enormous. However, its impact on our body has long been overlooked. It is only recently that nighttime light has started being recognized as a health hazard linked to cancer and many other diseases. Light, including artificial lighting, has a range of effects on human physiology and behavior and can, therefore, alter bodily responses when inappropriately timed. One of the potential light-induced disruptions is the effect of light on circadian rhythms, which influence many processes including the sleep-wake cycle, hormone rhythms, and gene transcription. The principle brain clock regulating circadian rhythms is located in the suprachiasmatic nucleus (SCN) of the hypothalamus. Light is the most powerful cue affecting rhythms generated in the SCN. In the present study, we asked whether nighttime lighting affects the clock function of the SCN, and if so, how. The experimental mice were kept in an 12:12hr light/dim light (300lux:30lux) condition while the control mice were housed in a 12:12hr light/dark (300lux:5lux) cycle. We first investigated the profile of circadian oscillation in the SCN by measuring the clock gene PER1 during day and night. Next, we examined the responsiveness of the SCN clock to an acute brief light exposure (300lux, 30min) during night phase. The results revealed that circadian oscillation and light responsiveness are both altered in the SCN of animals in the experimental group. Our study highlights the neurological effects of environmental lighting, and provides a neural basis linking artificial lighting to human diseases.

THE MATTRESS SOURCE

Nicholas Tootalian, Ryan Hurst, Michael Lippett, Collin Porteus, Taylor Smith

Mentor(s): Troy Hale (Telecommunications)

The Mattress Source is a short film that we shot for our TC 341 class. It took approximately two weeks to shoot and edit. In The Mattress Source, an employee at a mattress store is preparing to close for the night when a customer walks through the door. The customer tries out a bed and the store employee goes in the back-room to finish closing for the night. When the employee comes out to check on the customer, he is lying asleep on the bed. Through countless attempts, the employee can not wake the customer, and is driven to resort to extreme measures.

USING AN INDUCIBLE PROTEIN DEGRADATION SYSTEM TO STUDY ESSENTIAL GENES IN BACILLUS SUBTILIS

Angelica Tovar

Mentor(s): Robert Britton (Microbiology and Molecular Genetics)

Research in the Britton lab focuses on proteins involved in ribosome assembly. They have demonstrated that as an essential GTPase, RbgA, plays a role in assembly of 50S subunit in *Bacillus subtilis*. Essential gene products are required for survival, therefore they are difficult to study. An inducible protein degradation system has been developed by the Griffith lab at Massachusetts Institute of Technology, that offers a solution to the problem. The system involves fusing a modified *ssrA* tag to the gene of interest. This tag requires an adaptor protein, SspB that recognizes the tag and delivers the tagged proteins to ClpXP protease for degradation. The expression of SspB can be induced by a regulated promoter, thereby controlling the degradation of the protein of interest. Having used plasmid constructs from the Griffith lab, I created strains in *Bacillus subtilis* with an inducible protein degradation system to manipulate expression of genes of interest. The system is a simple way to control gene expression and allowed me to monitor the protein as it was degraded. I was unsuccessful in creating an inducible degradation system for the selected essential genes. The Griffith lab has mentioned that they have had problems with essential genes and this construct results in frequent rearrangements of the tag.

MICHIGAN POLICY NETWORK

Ashley Towner

Mentor(s): Matt Grossmann (Political Science)

I propose to participate in the Michigan Policy Network project, focusing on the urban affairs portion of the endeavor. Michigan Policy Network will be a website available to the public with information on several different public policy issues affecting Michigan. I will research current urban affair situations, gather published articles, create original documentation, write blog entries, and follow legislation that is being created in state and city government. This information will then be made available to the general public for decision making, opinion forming, or general insight to different issues.

A BUGS EYE VIEW

Genevieve Trombly

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

Bees and ants are both ingenious insects that used polarized skylight to navigate the world around them and to find food when sunlight isn't present. While the species have this in common, they also have different means of locomotion which causes different specialized features involved in their eyesight. In this experiment the eye facets of the bumblebee, *Bombus pennsylvanicus*, the honeybee, *Apis mellifera*, and a carpenter ant, *Camponotus pennsylvanicus*, will all be analyzed using scanning electron microscopy (SEM). There are thought to be many similarities in eye structure because all three species rely on visual landmarks to navigate their lives. *B. pennsylvanicus* and *A. mellifera*, on one hand, are able to effectively navigate any direction as well as detect color and symmetry. *C. pennsylvanicus*, on the other hand, is more effective at navigating only horizontally and have the ability to group similar elements and view objects with convexity. The SEM analysis of the three insects will then be compared to see the similarities and differences in the eye between the three species. Their differing behaviors and modes of locomotion are thought to cause changes in the development of the structure of the eye.

FRACTURE SURFACES

Andrew Trusty

Mentor(s): Carl Boelhart (Chemical Engineering & Materials Science)

I plan to compare and contrast the different fracture surfaces of titanium Alloys caused by fatigue failure and tensile failure. I will use a scanning electron microscope's imaging capabilities to do so.

IDENTIFICATION OF A NATURAL PRODUCT THAT REDUCES OBESITY AND ADIPOSITY

Allison Ulrich

Mentor(s): James Pestka (Food Science and Human Nutrition)

Average worldwide human weight has been increasing, making obesity a global pandemic. There is a need to find efficient preventative or therapeutic strategies to control this disease. One effective method to decrease obesity will be through the use of natural chemicals. Deoxyvalenol (DON) is a secondary metabolite produced by *Fusarium*, a fungus found in cereal grains that has been shown to reduce weight gain in many species. However, DON's effects on the weight of obese animals have not been systematically addressed. We hypothesized that DON consumption would decrease the weight of obese mice to the level of age-matched non-obese controls. Obesity was induced by feeding a high-fat diet to 12-week-old female mice for 9 weeks, after which the obese mice weighed 39.5g +/- .98g as compared to 29.2g +/- 1.1g in age-matched non-obese control mice. After obesity was induced, the obese mice were fed a high-fat diet with DON for 8 weeks. Weights of the obese mice fed 2, 5 and 10ppm DON for 8 weeks were 96.6%, 78.8% and 62.7% of that observed for control obese mice, respectively. Obese mice fed 10ppm DON had 62% adipose tissue compared to the non-DON fed obese mice, and a final weight comparable to the age-matched non-obese mice fed a control diet. In conclusion, DON dose-dependently decreased weight and adiposity in obese mice. DON's remarkable effectiveness in reducing weight and adiposity in obese mice makes this natural compound a potential therapy for human obesity.

HIGH STEP: A STORY OF THE SPARTAN MARCHING BAND

Andrew Vallentine, Nick Constantine, Peter Corriveau, Carly Ludtke

Mentor(s): Troy Hale (Telecommunications, Information Studies and Media)

"High Step" is a ten minute documentary produced for one of our Telecommunication classes. The film will be featured in the 2009 East Lansing Film Festival. The Spartan Marching Band is a unique Band where they strive for perfection. From marching in front of 70,000 people, to upholding decades of traditions the marching resonates with excitement and passion for the sport of marching. This documentary follows a "game day" looking through eyes of four prominent members of the Michigan State Marching Band. From 6:00AM on a game day Saturday the band preforms the jaw-dropping march to the stadium, to the crowd pleasing pre-game show where the band spins the S. The band strives to inspire Spartans everywhere and leads MSU to another victory. GO GREEN!

GENOTYPING TO IDENTIFY ENHANCED Wnt SIGNALING IN MICE

Andrew Vallo

Mentor(s): Laura McCabe (Physiology)

In addition to the commonly recognized complications of type I diabetes, the disease is also linked to decrease in bone volume and density. Studies have shown that type I diabetic bone loss results from a decrease in osteoblast number and maturation, which could be due to an increase in bone marrow adiposity. The augmentation of Wnt signaling by overexpression of Wnt10b (in transgenic mice) protects against bone loss caused by aging or insufficient estrogen levels through the stimulation of osteoblastogenesis. We hypothesize that Wnt10b transgenic mice will be protected from diabetic bone loss. However, prior to testing this hypothesis, it is necessary to breed and genotype wild type and transgenic (OCN-Wnt10b) mice. We bred wild type C57BL/6 mice with OCN-Wnt10b mice, and expected a one to one genotypic ratio in offspring. In order to genotype the mice, we obtained an ear punch, which served as the DNA sample. After the DNA was purified from tissue, we used spectrophotometer to measure DNA concentration. DNA specific to the transgenic mice was then amplified by PCR and the product separated on an agarose gel. After genotyping 73 offspring, we have observed a transgenic rate of 30%. Although this is lower than the expected 50%, we presume that more N are needed for an accurate ratio because embryonic lethality has not been previously reported in these mice. It is essential to determine the genotypes of our mice to facilitate the study of the effects of enhanced Wnt signaling on diabetic bone loss.

EXPLORING THE SCIENCE OF CREATIVITY

Megan VanDyke

Mentor(s): Michele Root-Bernstein (Theater), Robert Root-Bernstein (Physiology)

The purpose of this project is to test the hypothesis that highly creative people are more likely to be polymaths than less creative people by comparing the range and incidence of adult avocations of Nobel prize-winners in Literature to those of Nobel laureates in the sciences and to the general population. Our primary source is the official Nobel Prize website (<http://nobelprize.org>). These essays were supplemented by book-length biographies and autobiographies and essay collections. Every example of an adult avocation or hobby was encoded in an Excel spreadsheet and autobiographical or biographical comments about these avocations entered in a Word document. The data were compiled and the incidence calculated for each avocation or hobby. The individual avocation data were also aggregated into larger groupings (visual arts, music, writing, crafts, performing arts, and sciences). The Nobel data were then compared with data gathered in a previous study of Nobel prize-winning scientists (Root-Bernstein, et al., 2008) as well as to data on the avocations of the general population drawn from the U. S. census and the statistical significance of differences determined by chi-squared analysis. Pearson's R was also calculated for each comparison. Nobel prizewinners in Literature are like Nobel laureates in the sciences in being statistically significantly more likely to have multiple adult avocations than the average person. Unexpectedly, Nobel laureates in Literature are also much more likely to have multiple professional careers or training than Nobel laureates in the sciences.

EXPLORING SCIENTIFIC AND ARTISTIC APTITUDE

Megan VanDyke, Zachary Baum, Alex Petit

Mentor(s): Michele Root-Bernstein (Theater), Robert Root-Bernstein (Physiology)

The purpose of this project is to test the hypothesis that highly creative people are more likely to be polymaths than less creative people by comparing the range and incidence of adult avocations of Nobel prize-winners in Literature to those of Nobel laureates in the sciences and to the general population. Our primary source is the official Nobel Prize website (<http://nobelprize.org>). These essays were supplemented by book-length biographies and autobiographies and essay collections. Every example of an adult avocation or hobby was encoded in an Excel spreadsheet and autobiographical or biographical comments about these avocations entered in a Word document. The data were compiled and the incidence calculated for each avocation or hobby. The individual avocation data were also aggregated into larger groupings (visual arts, music, writing, crafts, performing arts, and sciences). The Nobel data were then compared with data gathered in a previous study of Nobel prize-winning scientists (Root-Bernstein, et al., 2008) as well as to data on the avocations of the general population drawn from the U. S. census and the statistical significance of differences determined by chi-squared analysis. Pearson's R was also calculated for each comparison. Nobel prizewinners in Literature are like Nobel laureates in the sciences in being statistically significantly more likely to have multiple adult avocations than the average person. Unexpectedly, Nobel laureates in Literature are also much more likely to have multiple professional careers or training than Nobel laureates in the sciences.

CLASSIFYING TYPICALLY DEVELOPING TODDLERS AND PRESCHOOLERS USING THE COMMUNICATION FUNCTION CLASSIFICATION SYSTEM (CFCS)

Katie VanLandschoot, Lauren Klee

Mentor(s): Mary Jo Cooley Hidecker (Communicative Sciences and Disorders/ Epidemiology, Communication Arts and Sciences)

This research is part of a larger project to validate a communication classification system for individuals with cerebral palsy (CP). The Communication Function Classification System (CFCS) is based on the communication activity level of the World Health Organization's 2001 International Classification of Functioning, Disability and Health (ICF). The CFCS consists of 5 levels based on everyday communication performance. CFCS Level I performance is characterized as an effective sender and receiver with familiar and unfamiliar communication partners while maintaining a comfortable conversational pace. During the CFCS validation process, no clear consensus emerged on the age at which a majority of preschool children, with or without CP, are likely to demonstrate Level I performance. This research gathered CFCS communication performances of 30 typically-developing preschoolers (ages 2, 3, and 4) classified by unfamiliar partners. Children were recruited through advertisements on web-based message centers, at daycares/preschools, and through individual contacts. Researchers observed communication between the child and an unfamiliar partner (researchers) and a familiar partner (teachers, peers, and/or parents). Any child's communication not classified as Level I were re-classified 2 months later by unfamiliar partners. Data will be analyzed to determine the age at which 90% of typically developing preschoolers' communication is classified as Level I, examine whether different CFCS levels are typically associated with specific communication behaviors, and identify if a child's classification changes over time. Results will be considered in determining lower age limits of the CFCS and discussing ICF communication activity performances of young children.

THE HARMFUL AFFECTS OF LEAD

Danielle Vasko

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

Lead is poisonous to children, yet many toys were recently made that contained lead. I have researched which toys have been known to contain lead, and what the government has done to prevent the further development of toys that contain lead. Using an SEM, I will test toys that I have in my own home to see if any of them contain lead.

PEOPLES' PARK: ARCHAEOLOGY AT MSU

Elizabeth Velliky

Mentor(s): Terry Brock (Anthropology), Lynne Goldstein (Anthropology)

MSU's Peoples' Park is the location of an archaeological site found during a construction project in 2008. The purpose of the research reported here is to link the findings recovered and a specific campus building event. This can not only provide insight on campus activities and life in the past, but also aid in understanding part of MSU's history and development as a Land Grant institution. The possible buildings linked to this site are the Chittendon Memorial Cabin built in 1935 and taken apart in 1965; and the Short Course Dormitories, built in 1941 as a barracks for the National Youth Administration. The findings from this site range from an intact light bulb used from 1920-1940, glass scientific test tubes, glass bottles with corks intact, to cafeteria dinnerware. Items are likely linked to the Short Course Dormitories as the dinnerware and Listerine bottles are indicative of dorm life, but whether they are directly linked to the buildings or pre-date them has yet to be determined. Some of the other artifacts, such as the glass test tubes, inkwells and chemical bottles, indicate the presence of an academic-based building. However, since the Short Course Dormitory buildings not only housed students but also held classes in them, it is likely that these artifacts are linked to these buildings. In sum, the wide range of materials provides an interesting and unique view into the activities of MSU students during the great depression era.

LOS PANTALONES GREEN: CONSTRAINTS ON SPANISH-ENGLISH CODE-SWITCHING IN NOUN PHRASES

Emily Rose Medow Vercammen

Mentor(s): Jan Anderssen (Linguistics and Languages)

The present study focuses on code-switching of balanced Spanish-English bilinguals within noun phrases. With this study, the investigators hope to address two currently dueling theories that outline the linguistic limitations on Code-Switching: Carol Myers-Scotton's "Matrix Language Framework Model" (MLF) and Jacqueline Toribio's "Parsimonious Grammar Model". The MLF maintains that in code-switching, acceptability is determined by the matrix language (dominant language), which contributes the syntactic structure and system morphemes. On the other hand, the Parsimony Theory argues that code-switched statements are acceptable if both languages' syntactic structures align. Noun phrases constitute an ideal testing ground for these theories, as Spanish allows both pre- and post-nominal adjectives whereas English only allows pre-nominal adjectives. In contexts where Spanish is the Matrix language, the MLF predicts that code-switching is acceptable for both pre- and post-nominal adjectives. The Parsimony Theory, on the other hand, predicts that only the structure that is shared between both languages will allow code-switching, i.e. the structure in which the adjective precedes the noun. Assessing the nature of code-switching via response times rather than introspective acceptability judgments may provide further insight into the underlying mechanisms of code-switching, while addressing concerns about collection of acceptability judgments on code-switching raised in the literature (Mahootian and Santorini 1996).

COMPARISON OF PHYSICAL ACTIVITY LEVELS DURING STRUCTURED AND UNSTRUCTURED ACTIVITIES IN CHILDREN AND ADOLESCENTS

Laura Vielbig

Mentor(s): Karin Pfeiffer (Kinesiology)

Introduction: For intervention purposes, it is important to determine if children/adolescents are more active in structured activity (SA) versus unstructured activity (UA). The purpose of this investigation was to determine 1) whether participants were more active during SA or UA during a simulated after-school program and 2) if there was a gender difference in activity levels. Methods: Participants were 108 children, 6-15 years old. Physical activity (PA) intensity levels were assessed using the Actical accelerometer and classified as sedentary (SED), light (LPA), moderate (MPA), vigorous (VPA), or moderate-to-vigorous (MVPA). Participants engaged in two after-school program visits, low activity and high activity. Visits consisted of snack time, SA time, homework time, and UA time. Repeated measures ANOVA was used to examine differences between SA and UA and gender differences. Results: During the low activity visit, participants spent more time in SED and LPA during SA compared to UA ($p < 0.01$). During the high activity visit, participants spent more time in SED, VPA, and MVPA in SA than UA (20.5 vs. 17.8 min for MVPA, respectively) ($p < 0.01$). Boys were more active than girls (20.1 vs. 16.2 min MVPA) during UA for the high activity visit. Discussion: In an after-school program setting, children/adolescents obtained more activity during UA than SA in a low activity setting. However, they obtained more activity during SA than UA in a high activity setting. Boys and girls may respond differently to programs involving SA versus UA, which researchers and practitioners should consider when designing programs.

DOES THE PLURAL CONTAIN THE SINGULAR?

Jessica Wallace

Mentor(s): Cristina Schmitt (Linguistics & German, Slavic, Asian & African Languages)

We investigate the interpretation of plural morphology by children aged 3-5 in generic and non-generic contexts, as well as in questions and statements, by using a modified truth-value judgment task (Crain & Thornton 1998). Although any native speaker of English thinks every plural noun is associated to a plurality of objects in the world, this is not always the case. In (1) the plurals are not necessarily associated to a plurality of individuals. We answer 'yes' to (1a), even if we only have one child. Similarly, we don't consider (1b) false, although dogs only have one tail each. (1)a. Do you have children? b. Yes, one. (NOT: No, one.) (2) Dogs have tails. Based on data of this sort, Sauerland et al. (2005), argued that plural is semantically unmarked and that "plural" set interpretations arise as an implicature. If singular forms are not used, it must be because the plural interpretation is intended. To test this hypothesis, they tested children's interpretation of plurals and found that children accept plurals in conditions where adults do not. To account for this, they argued that the difference lies in children's difficulty with implicatures, which has been shown in other experiments. Our study reexamines his experiments. We hypothesize that children's non-adult-like interpretations arise from interactions between generics (prone to exceptions) and questions (which lack truth-values). We test both children and adults using a Truth Value Judgment Task.

THE NEW IN THE OLD: STEPHEN BERKMAN

Sunny Ching Hui Wang

Mentor(s): Louise Siddons (Art & Art History)

As we move forth through the 21st century, we witness artists take up new media and institutions, such as universities and museums, accept and inaugurate new media as a field of study or department. However, there is a growing group of contemporary photographers working today with old and generally forgotten processes of photography that deserve our attention. An artist belonging to this group of photographers is Stephen Berkman. Stephen Berkman, who is based in California, works not only in photography, but also with installation and film. However, I have selected this artist based on his choice to present surreal subjects through 19th-century photographic processes such as ambrotypes. In addition, the artist does not date his works, which is, I believe, is a part of the mystery aesthetic Berkman is creating for his viewers. I elected to focus on a single artist, Berkman, because I think I was most struck by the question of why contemporary artists are practicing with old photographic methods. Their choice of media spurs questions such as what are the aspects of these methods that attract contemporary photographers today and what are they trying to communicate to today's audience unfamiliar with the nearly extinct presentation of images. By attempting to find some answers to these questions, I hope to discover the value of the works of contemporary photographers working today with historical media.

OUTCOMES OF STUDENT INTERNSHIP EXPERIENCES IN AGRISCIENCE AND NATURAL RESOURCES TEACHER EDUCATION AT MICHIGAN STATE UNIVERSITY

Renee Wangler

Mentor(s): Jennifer Rivera-Caudill (Community, Agriculture, Recreation, and Resource Studies)

Currently, no set program is in place for student teachers and mentors to follow during the Michigan State University Agriscience and Natural Resources student teaching field experience. The purpose of this study is to gather opinions of current agriscience and natural resources teachers regarding the outcomes student teachers need to achieve while completing their field experience. The population of interest for the study was ANR teachers in the state of Michigan. Fifteen ANR teachers identified 154 outcomes that they felt were necessary for student teachers to achieve by the completion of their internship year during two focus groups held in the spring of 2008. These findings show the components that could be introduced into the Agriscience and Natural Resources teacher education internship program. By identifying and integrating these components, the teacher education program will provide student teachers with the skills necessary to be successful agriscience and natural resources educators. The next step will be to distribute a survey based on the focus group findings to all Agriscience and Natural Resources teachers in the state of Michigan to determine the importance of each outcome to the successfulness of the student teaching field experience.

WHERE SHOULD THE MONEY GO? AN ANALYSIS OF THE WAR ON MALARIA

Alexander Webb, Matt Steffes

Mentor(s): Mark Largent (Social Relations)

Malaria impacts vast areas within the sub-tropical countries of Africa, the Americas, and Asia, impeding economic growth, industrialization, and stability in endemic areas. The effect of malaria greatly hinders progress in these areas and prevention is paramount to making these areas survivable. Programs exist to create a vaccine that can target the spectrum of Plasmodium parasites responsible for infection, but they have not produced any results showing efficacy in long-term immunity. The question arises: should we allocate funding towards holistic preventative measures to control malaria infection or concentrate on a Plasmodium vaccine? And to what degree? We researched the known preventive measures and vaccine efforts and compared cost v. efficacy. Cost-analysis of malaria-control efforts showed that despite millions in funding, vaccine research and development was ineffective, with almost no progress toward a suitable vaccine. Reasons for this include varying goals and approaches by research teams, in addition to a lack of investment by the private sector. Bed nets and indoor residual spraying showed the highest rates of efficacy. Although a vaccine would be an ideal way to hinder malaria, progress has been slow. We conclude that more funding should go into preventative measures rather than vaccination because of the dramatic difference in cost-effectiveness. Acting immediately to slow the spread of this parasite is the best way to keep economic development progressing in malaria-endemic nations, improving the standard of living within a few years, rather than the decades it could take to create a suitable vaccine.

MICROCOMPUTED TOMOGRAPHY ANALYSIS

Dani Michele Weinman

Mentor(s): Laura R McCabe (Physiology)

Insulin dependent diabetes mellitus, commonly known as Type 1 (T1-) Diabetes, is distinguished by minimal or no insulin production by the pancreas and elevated blood glucose levels. Some elements that may contribute to T1-diabetes include environmental, genetic, and autoimmune factors. T1-diabetes can cause bone loss and suppressed bone formation. Over fifty percent of T1-diabetic patients are thought to have bone loss. To identify bone loss in diabetic mouse models microcomputed tomography (μ CT) imaging (GE eXplore Locus Micro CT Scanner) is used to create 3-dimensional bone structures from which density is measured. When being analyzed, x-ray particles are emitted from the tube, move through the bone and act on the scintillator to create a radiographic projection. Some x-ray particles miss the bone, some hit the bone and are deflected or bounced back, and others pass through the bone and are detected. The projection that is created with the scanner is a representation of the bone. These two dimensional projections are reconstructed into a three dimensional volume. The GE MicroView program is used to analyze these volumes for bone density. The 3D images allow for different areas of the bone to be analyzed. These measurements can provide insight into diabetic bone loss when compared to those of

non-diabetic specimens. Diabetic trabecular bone shows a fifty percent decrease in volume compared to those of healthy mice. Understanding the mechanisms behind T1-diabetic bone loss is essential for developing possible new therapeutics.

MICHIGAN POLICY NETWORK

Erica Weiss

Mentor(s): Matt Grossmann (Political Science)

The Michigan Policy Network is a research-based web site that investigates and facilitates community understanding of the major public policy issues at the state level. As researching K-12 Education at a state level my findings have uncovered similar patterns of both problems and typical solutions suggested by policy-makers. The site makes use of uncovering contributing partners on the discussion of education on the state level, along with reporting on current topics in the news, current legislation and policy briefs on the major issues that effect education both past and present. Merit pay, charter schooling, teacher-quality and struggles with No Child Left Behind compliance are at the forefront of policy concerns in Michigan Education. Furthermore, the research includes looking at the policy changes presented at the administrative level and the effectiveness as policy for the state of Michigan. The research serves to try and familiarize concerned citizens and experts in the field of education, to keep them updated and aware in order to hold policy makers accountable in the decisions being made for educators and students in the state of Michigan.

THE EFFECT OF TGF-1 ON CELL PROLIFERATION IN THE BOVINE MAMMARY GLAND DURING THE DRY PERIOD

Kayla Weiss

Mentor(s): Karen Plaut (Animal Science)

The role of TGF- β 1 during the dry period of dairy cows is unknown. The objective of this study was to determine whether TGF- β 1 affects the proliferation of bovine mammary tissue during the dry period. We hypothesized that addition of TGF- β 1 to mammary explant cultures would increase stromal cell proliferation and decrease epithelial cell proliferation. Mammary biopsies from seven multigravid Holstein cows were collected at four different time points—275d lactation, 1 week dry, 3 weeks prepartum, and 1 week prepartum. Biopsied tissue explants were incubated for 2 hours in Waymouth's media supplemented with insulin, hydrocortisone, 50 μ M bromodeoxyuridine (BrdU) and either 0ng or 5ng of TGF- β 1. Immunohistochemistry was performed on formalin fixed paraffin embedded tissue sections using the Zymed BrdU Staining Kit (Invitrogen, Carlsbad, CA). Images were analyzed using Image Pro software by manually tagging stained and unstained epithelial and stromal cells. At each time point, approximately 2,200 epithelial and 1,500 stromal cells were counted. When the study is complete, it's estimated that 10,000 to 15,000 cells of each cell type, epithelial and stromal, will be counted. As expected, the preliminary data revealed an increase in epithelial cell proliferation from 0.2 percent during late lactation to 0.7 percent during one week prepartum (P<0.02). TGF- β 1 did not alter the percent of cell proliferation in either the stromal or epithelial cell population; however there was large variability in the response. This project was supported by National Research Initiative Competitive Grant no. 2006-35206-16719 from the USDA Cooperative State Research, Education, and Extension Service.

ASSESSING THE ACCESS TO HEALTHCARE: THE AFRICAN-AMERICAN INFANT MORTALITY RATE

Jennifer White

Mentor(s): Louise Jezierski (Social Relations & Policy)

According to the Michigan Department of Community Health (MDCH) and the Center for Disease Control (CDC), the infant mortality rate among African-Americans is significantly higher than any other racial/ethnic group. The purpose of my study is to investigate possible reasons as to why this gap exists between Blacks and Whites. Researchers have attributed high infant mortality among Blacks to the composition of neighborhoods-including, residential segregation, and lack of access to maternal and prenatal resources, to racism, and to other socioeconomic variables (Clark, 1999, Collins, 1995; Cooper, 1984; Ellen, Mijanovich, & Dillman, 2001; Geronimus, 1996; Goza, Stockwell, & Balistreri, 2007). The unit of analysis consists of 52 selected zip codes from the Metropolitan-Detroit and Lansing areas. The independent variables are Blacks and Whites, median household income, and poverty status. My study examines the correlation between median household income, poverty status, and the number of infant deaths and low weight births for both Blacks and Whites by zip code. I hypothesize that (1) Blacks have a significantly higher infant mortality and low weight birth rates in any zip code than Whites, (2) Infant mortality and low birth weight rates by zip code are positively associated with the poverty rate, and (3) Infant mortality and low birth weight rates by zip code are negatively associated with income. From my findings I conclude that there is a significant difference between Blacks and Whites concerning infant health. I also found that median household income and poverty status are not significant factors.

ELECTROACTIVE BIOMIMETRIC TO SIMULATE SACROMERE FUNCTIONS

Joshua Whitman

Mentor(s): Seungik Baek (Mechanical Engineering), Christopher Hunley (Mechanical Engineering), Andrew Kim (Engineering), Xiaobo Tan (Electrical and Computer Engineering)

The device being presented is a biomimetic (ie. mechanical / electrical device that simulates a biological process) that will be used for the K-12 Outreach Program in Design Day. The objective of this project is to stimulate academic interest within the disciplines of Mechanical Engineering, Electrical Engineering, and Physiology. In terms of function, the device employs the use of electroactive polymer (EAP) immersed in a water bath that, when electrically stimulated, produces a motion very similar to that of the human sarcomere (contractile unit of muscle cell fiber). This is accomplished by the unidirectional bending of multiple EAP pieces attached to a connecting strip, which is then attached to a displacement reader. This motion demonstrates the fact that many sarcomeres must function together in order to produce a noticeable contraction in the body. Additionally, the voltage and frequency of the input can be adjusted on the signal generator to simulate the physiological effect of increasing the electrolyte content within a biological system. The novelty behind this device is that it does not require complicated assembly procedures to correctly function. Therefore, middle school or high school students visiting on Design Day will be able to partially assemble and use the device within a 50-minute period.

POST PROCESSING MICROBIAL CONTROL OF PEELED CHESTNUTS

Michael Wiederoder, Kyle Anderson, Jackie Palmer, Thomas Skrocki

Mentor(s): Daniel Guyer (Biosystems Engineering)

Chestnut Growers Inc., a cooperative of farmers, produces peeled chestnuts, a value added commodity, for wholesale to consumers with demand rapidly increasing throughout the United States. During the processing a microbial build-up occurs on the surface of the product that creates a spoilage biofilm after a short period of refrigerated storage. A solution to reduce the microbial load must be devised to prevent an unsightly and unpalatable product from reaching consumers. To achieve the objective, a two log reduction in total microbial count is needed to prevent biofilm buildup, based on previously collected data. After an extensive literature search the project focused on steam treatment, chemical bath in food grade chemicals, and exposure to ultraviolet light as processing methods to reduce the microbial load. Project constraints include capital investments, operation and maintenance costs,

maximum throughput, floor space, and minimal change to the texture, taste, and appearance of the product. Standard microbiological techniques for each treatment step evaluate the ability of each method to reduce the microbial load. The results are statistically analyzed to reveal the most effective treatments. Treated chestnuts underwent sensory evaluations to determine changes to the overall taste and texture as well. Commercial designs based on bench-scale results and other general recommendations regarding the product are developed to meet the client's needs.

ELECTROSPUN TIN COATED ALUMINA FIBERS FOR GAS SENSING APPLICATIONS

Sara Wiederoder

Mentor(s): Lawrence Drzal (Chemical Engineering & Materials Science)

Tin-oxide coated alumina fibers were fabricated for gas sensing applications using an electrospinning process. The organically modified alumina fibers were produced via sol-gel chemistry from aluminum isopropoxide. Aligned fibers were produced by electrospinning across a C-shaped gap collector using a potential of 10 kV and a spacing of 19 cm. The fiber mats were characterized with an Environmental Scanning Electron Microscope (ESEM) to examine the surface roughness, alignment, and fiber diameter. The diameters of the aligned alumina fiber were 1.6 μm as spun and 1.0 μm following calcination at 550°C. Tin oxide was coated onto the fibers by dipping the fiber mats into a solution of tin(IV) butoxide. After coating, the fibers were then calcined to remove organic moieties and form an oxide network. Changes in the fiber morphology after calcination were examined by ESEM. The surface chemistry was examined by X-ray photoelectron spectroscopy.

JURASSIC COMMANDER POSTMORTEM

Bert Wierenga, Marie Lazar, Patrick Mussell, Andrea Pollitt

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

Jurassic Commander was a four week project produced by a small well rounded team consisting of a programmer, an artist, a designer, and an audio engineer. It is a Digital Video Game produced using the Unity3D engine. It most appropriately fits into the Real-Time-Strategy Genre. The theme given to the students was to make a game centered on the verb 'Build'. The team decided to make a simple Real-Time-Strategy game where two players would compete with one another by building their Dinosaur armies. To further the challenge, the team decided that the two players were to provide input solely from two Nintendo Wiimotes.

FARE CHANCE

Kristin Wild, Mallory Root

Mentor(s): Bob Albers (Telecommunications)

Films have long been an integral part of society. Starting with the first silent films in the 1920s all the way through to blockbusters of present, movies have a large impact on individual lives. They come in all shapes and sizes, but every filmmaker starts with a student film. These works often show the potential of a director, cinematographer, producer, or editor. Whether they convey a social issue, or are just plain fun, they are important to the learning and evolution of films.

AMERICAN INDIAN'S IN POPULAR CULTURE

Andrew Wildbill

Mentor(s): Phil Bellfy (Writing, Rhetoric & American Culture)

Modern culture has conditioned most of society to accept racial imagery at a young age. From grocery aisles, to toy aisles, there is a high acceptance of Native American images in popular culture. Our project is focused on creating a virtual museum and image database of historical and modern Native American imagery, which has no political boundary. With these two tools we hope to: 1) Allow native people to give their perspective and interpretation of images. 2) Educate the public about sensitivity and interpretation or meaning of images. 3) Allow the public to access and give input for a more extensive database. 4) Awareness of Native American's in Popular Culture and Native American identity.

ENSLAVED WOMEN'S SEXUALITY

Bianca Willis

Mentor(s): Jualynne Dodson (Sociology), Brittany O'Neal (African American Studies)

Learning about enslaved women's sexuality will help researchers learn about African American women of today. It provides answers to why African American women of today have the issues and conditions that they have. Many have issues dealing with their skin color thinking the lighter the skin the prettier they are. Many also believe that using their bodies is the best way to getting what they want in life. Both these issues stem from enslaved women during the antebellum time period. This research paper is trying to discover what was the enslaved woman's sexuality, in terms of how it was linked to the white slave owners sexuality. In addition this research paper is trying to discover how the enslaved woman's sexuality presented a threat to the social order. In order to solve, this I will study the historical documents and narratives about enslaved women during the antebellum period in the United States. It has been found that enslaved African American women were treated not only as cattle but as women whose main purpose was to be sexually available to white men at all times. Some resisted while others used it to their advantage. The sexuality of the enslaved was not based on her own wishes but rather on everyone else's.

METABOLOMIC ANALYSIS USING FEMTOSECOND LASER-INDUCED IONIZATIONDISSOCIATION (FS-LID)

Nelson Winkler

Mentor(s): Marcos Dantus (Chemistry)

Mass spectrometry (MS) is a widely used analytical method for the determination and quantification of metabolites in unknown sample mixtures, and has been paired with front-end separation techniques such as liquid and gas chromatography. Interfacing of a femtosecond laser in the use of MS yields greater structural information about an unknown isolated molecule. Femtosecond Laser-induced Ionization/Dissociation (fs-LID) yields fragmentation patterns unachievable by traditional collision induced dissociation. Described is the analysis of metabolites, including α -tomatine, a steroidal glycoalkaloid found in tomato plants, using the novel ion activation method of femtosecond laser-induced ionization/dissociation, and the resultant increase in information obtained versus traditional collision induced dissociation.

SEEING BETTER: OPTIMIZING SURGICALLY INDUCED ASTIGMATISM CORRECTION FACTORS FOR CATARACT SURGERY

Nelson Winkler, Erin Milne

Mentor(s): Akililu Zeleke (Statistics and Probability)

Cataract surgery is one of the most common operations performed in the United States each year. Cataract surgery is seen as a 'routine' procedure; however, it is not without complication. The surgery changes the natural astigmatism of the eye, which can cause blurry vision. It is possible to correct for this surgically induced astigmatism (SIA) during the operation. Currently, a standard correction factor of 0.5 diopters (D) is used. While this correction factor produces respectable results, we endeavored to improve upon the model and deliver individualized SIA predictions. The goal of our project was to predict the SIA for use in surgery on a second eye, based upon prior surgical results from the same patient. Pre-operative and post-operative cataract surgery data was gathered from a private ophthalmology practice. SIA values were then calculated, and a two-sample t-test was done to compare the mean values for left and right eyes. When no significant difference was found, we performed regression analysis to determine a model for SIA prediction. We analyzed our models using residual plots, a chi-squared test for goodness of fit, and generated a graphical comparison between our model and the standard correction factor of 0.5 D. We found that our model is on par with the currently accepted standard correction factor and is, in fact, more accurate in cases of significant difference between the models. We believe we have generated a useful tool that can be easily and successfully utilized in patient care.

EXCLUSION ANALYSIS OF CANDIDATE GENES UNDERLYING HEREDITARY ECTOPIC URETERS IN ENTELBUCHER DOGS

Paige Winkler

Mentor(s): John Kruger (Small Animal Clinical Sciences), Courtney North (Small Animal Clinical Sciences), Patrick Venta (Small Animal Clinical Sciences)

Entlebucher Sennenhund is a rare breed of dog that has a small inbred (Founder) population, which is based upon a relatively small number of dogs being imported to America. They suffer from a health defect known as Entlebucher Urinary Syndrome (EUS), in which the ureter is inserted into the bladder incorrectly. Ectopic ureters cause incontinence and can lead to other urinary tract problems with the dogs. The mode of inheritance of EUS is unknown but is assumed to be a mutation in at least one necessary gene. Our goal is to develop a DNA-based carrier test to help breeders make informed breeding decisions based upon knowledge of genetic status of the potential breeding pairs. However, in order to do this, it is first necessary to identify the culprit gene. I tested the hypothesis that one of several candidate genes was this culprit by exclusion analysis. For necessary genes, affected dogs must share either one or both alleles; otherwise the gene is excluded as being causative of the condition. A key advantage of exclusion analysis is that candidates can be eliminated quickly to devote more time to non-excluded genes. Using the UCSC genome browser, I identified tetranucleotide microsatellites within the candidate genes, designed PCR primers using Primer3, and genotyped EUS-affected dogs. PAX2, EYA1, FOXC2 and NPHP4 genes were excluded because no allele was shared among all affected dogs. BMP4, GDNF, ROBO2, HNF1B and KAL could not be excluded. These genes will be undergoing sequence analysis to look for mutations.

DRIVER VISIBILITY, NAVIGATIONAL DISPLAYS AND CAR MAINTENANCE

Justin Wong

Mentor(s): Constantinos Coursaris (Telecommunication Information Studies, and Media)

Since the beginning of automotive transportation, driver visibility has always been a key factor in vehicle design. Since then, there have been many advancements on vehicle design for that specific purpose. Since the creation of the automobile, there are two very noticeable advances in technology for visibility. First, is a xenon headlamp, constant studies have shown it to be more efficient and more effective than the original halogen headlamps. The next is the navigational displays. Not only do they allow the driver to focus on the roads more, they sometimes display crucial information that drivers may not necessarily see otherwise. I theorize that even though technology has been proven to make the automobile more usable, it does not come without cons. With xenon headlamps, and navigational displays, the driver may be tempted to abuse the vehicle more than a person without. Since the headlamps provide added light while driving, perhaps the driver may be more negligent of the cleanliness of his windshield, or he may not realize one of his lights has burned out. The same thing with a navigational display. Also, another point of the experiment is to test if some technology provides more usability than others. Or, it becomes a question of preference, such as, which age group of drivers prefer what kinds of technology, and what benefits are associated with which piece of technology. Also, which age group of drivers are typically most negligent of their vehicles.

IDENTIFYING THE ROLE OF DOCOSAHEXAENOIC ACID IN COLITIS-ASSOCIATED COLORECTAL CANCER

Hillary Woodworth

Mentor(s): Jenifer Fenton (College of Nursing)

Individuals presenting with inflammatory bowel disease (IBD) have an increased risk of developing colorectal cancer. Dietary strategies aimed at reducing enteric inflammation prove promising as potential methods of cancer prevention. The long chain omega-3 fatty acid, docosahexaenoic acid (DHA) has potent anti-inflammatory properties. In this study, we investigated the role of DHA in the progression of colitis-associated tumorigenesis using a murine model of pathogen-induced colitis. When FMAD3-deficient mice are exposed to H. hepaticus, intestinal inflammation with subsequent tumor formation is seen within four to eight weeks of infection. We hypothesized that high quantities of dietary DHA would ameliorate the onset of adenocarcinoma via inflammatory reduction in the intestine. Contrary to expectations, we have shown that excessive amounts of DHA actually aggravate carcinogenesis. This finding is vital in determining proper guidelines regarding DHA supplementation in patients with IBD.

MODELING ELECTRONIC CHARGE TRANSFER OF GOLD NANOPARTICLES AT THE ULTRAFAST TIMESCALE

Richard Worhatch

Mentor(s): Chong-Yu Ruan (Physics)

As transistor manufacturing technology produces electronic circuits of progressively smaller size and are driven operate at increasingly higher frequencies, the characterization of the dynamics of electronic charge transfer in nanoscale systems becomes especially relevant. Similarly, recent photovoltaic devices using nanoparticles suggest that a deeper understanding of the nature of photoinduced charge carrier dynamics could lead to an improvement of power generation using solar energy. However, studying such samples at the desired resolution in both space and time is not trivial. The Ultrafast Electron Crystallography (UEC) Lab at MSU has demonstrated the capability to analyze shifts in diffraction peaks to probe charge transfer at the femtosecond-picosecond time scale after the photoexcitation of nanoparticles and a silicon substrate with pulse laser excitations of various fluences. An electronic model is presented which can explain the observed transient surface voltage in the case of samples of silicon alone. This case is then compared to data taken from a sample with 20nm gold nanoparticles to extract the electronic behavior of the nanoparticles as a result of the excitation. The model used for the silicon surface is extended to study the nanoparticles as well, and some implications of the models are discussed.

EXAMINATION OF COSMETIC POWDERS WITH A SEM

Kathryn Worley

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

This project will take several different cosmetic powder foundations and examine them under a scanning electron microscope in order to determine the composition of the powders. The results will be compared and contrasted between the different powders. Upon determining the compositions, further investigation will allude to the possible reasons behind the use of the materials by companies and what effects these materials separately may have on human skin.

DOES THE ABILITY TO CRACK BONE IN ADULTHOOD SLOW SKULL DEVELOPMENT?

Rachel Wright, Nina Boychuck, Chelsea Pike

Mentor(s): Kay Holekamp (Zoology), Barbara Lundrigan (Zoology)

The skulls of mammalian carnivores that are adapted for bone-cracking are unusually robust and show a number of specialized features. The most notable cranio dental adaptations of the bone cracking forms are robust teeth coated with crack resistant enamel, a vaulted forehead, a large sagittal crest, and massive zygomatic arches; these last two skull features provide attachment sites for powerful jaw muscles. This morphology allows bone-cracking carnivores to exert enormous bite forces for their respective body sizes. Here we tested an hypothesis suggesting that development of skulls with this very robust feeding apparatus requires much more time than does development of unspecialized skulls. Specifically, we compared patterns of development in two bone-cracking hyena species with those in carnivores that consume little or no bone in adulthood. We took standardized photographs of museum specimens in multiple views, digitized landmarks on each photograph, and used geometric morphometric techniques to evaluate change in size and shape between birth and adulthood. Our data showed that development of skulls specialized for bone-cracking is indeed a slow and prolonged process. Whereas unspecialized skulls reached full maturity long before puberty, the skulls of bone-cracking forms were not fully mature until well after these animal attained reproductive maturity.

RESEARCH TRAINING PROGRAM FOR UNDERGRADUATE STUDENTS IN BIOLOGICAL AND MATHEMATICAL SCIENCES (UBM)

Samantha Wroblewski

Mentor(s): Laura McCabe (Physiology)

More than 15,000 children in the United States are diagnosed with Type 1 (T1) diabetes annually. T1-diabetics cannot make insulin and thus have increased blood glucose levels. Without insulin injections this autoimmune disease is fatal. Another complication is bone loss (osteoporosis), which predisposes patients to fractures that are difficult to heal. To examine mechanisms of T1-diabetic bone loss, gene expression profiles between healthy and diabetic mouse bones were compared. Additionally, osteoblasts (bone making cells) were cultured separately from other cells in the bone and exposed to high levels of glucose (simulating diabetes) or left in normal growth medium (control). RNA was extracted from both the cultured osteoblasts as well as from mouse tibiae then processed for Affymetrix gene chip arrays. This enables the comparison of gene expression levels between healthy and diabetic mice, as well as between normal and "diabetic-like" osteoblasts. The computer program Genespring was used to analyze and compare the data sets statistically and graphically. We found several gene sets that were modulated in both the mouse and the "diabetic" cell culture models, including those involved in regulating inflammation, cell death and metabolism. One particularly interesting gene subset significantly decreased in diabetic mice involves bone morphogenic protein (BMP) signaling, a critical pathway involved in promoting bone formation by osteoblasts. By determining common gene level alterations in diabetic mice and cell culture models, underlying contributors to diabetic bone loss can be identified and used as a therapeutic targets to prevent bone loss.

GEOGRAPHIC RACIAL EQUALITY

Dustin Yu

Mentor(s): Joe Darden (Geography)

This paper examines geographic racial equality in municipalities in Macomb County Michigan between African Americans and Whites. Data used were obtained from the United States Bureau of the Census Summary File 4 for 2000. The socioeconomic variables measured were income, education and occupation. Residential Segregation based on the census tracts was measured using the index off dissimilarity. Geographic racial equality between African Americans and Whites exists in at least one municipality in Macomb County Michigan.

SPEED OF LIGHT BY DISTANCE-TIME MEASUREMENT OF LASER PULSE

Fei Yuan

Mentor(s): Chong-Yu Ruan (Physics and Astronomy)

A set of experiments was performed to measure the speed of light by calculating the ratio of distance to travel time of a ultrashort laser pulse. Similar to an experiment Galileo once attempted to perform, we measured the time difference between the passing of a laser pulse and its reflection using an oscilloscope trace. With sufficiently high number of data points for various distances, we were able to use linear regression to obtain the speed of light to 3 to 4 significant figures, depending on the method of analysis.

Faculty Mentors

Many thanks to the dedicated faculty mentors who guided and supported the undergraduate research and creative activities presented today.

Galeb Abu-Ali, *Microbiology*
Gerry Adams, *Plant Pathology, Biology*
Peter Aerts, *Biological Sciences*
Azeez Aileru, *Biomedical Research Infrastructure Center*
Imad Ajjawi, *Biochemistry & Molecular Biology*
Katherine Alaimo, *Food Science and Human Nutrition*
Bob Albers, *Telecom, Information Studies & Media*
April Allen, *School of Planning, Design and Construction*
Richard Allison, *Plant Biology*
Eva Almenar, *School of Packaging*
Evangelyn Alocilja, *Biosystems Engineering*
Erik Altmann, *Psychology*
Geri Alumit-Zeldes, *Journalism*
Jan Anderssen, *Linguistics and Languages*
Robert Anstey, *Geological Sciences*
David Arnosti, *Biochemistry*
Cindy Arvidson, *Microbiology and Molecular Genetics*
Dennis Arvidson, *Microbiology*
William Atchison, *Pharmacology and Toxicology*
Seungik Baek, *Mechanical Engineering*
Michael Bagdasarian, *Microbiology and Molecular Genetics*
David Bailey, *History*
Sherrie Barr, *Theatre*
Jeffrey Barrick, *Microbiology and Molecular Genetics*
Cornelius Barry, *Horticulture*
Ronald Bates, *Animal Science*
Alison Bauer, *Pathobiology & Diagnostic Investigation*
Melissa Baumann, *Chemical Engineering and Materials Science*
Phil Bellfy, *Writing, Rhetoric & American Culture*
Christoph Benning, *Biochemistry*
Richard Bernsten, *Agricultural, Food and Resource Economics*
Manju Bhat, *Life Sciences & Project Strengthen*
Shannon Biergans, *Nursing*
Norman Birge, *Physics and Astronomy*
Matt Blank, *Western Transportation Institute*
Carl Boehlert, *Chemical Engineering and Materials Science*
Howard Bossen, *Journalism*
Ryan Bowles, *Psychology*
Danita Brandt, *Geological Sciences*
Mary Bremigan, *Fisheries and Wildlife*
Mary Bresnahan, *Communication*
Robert Britton, *Microbiology and Molecular Genetics*
Terry Brock, *Anthropology*
Neeraj Buch, *Civil Engineering*
NiCole Buchanan, *Psychology*
Bonnie Bucqueroux, *Journalism*
Lyle Burgoon, *Biochemistry and Molecular Biology*
Miguel Cabanas, *Spanish and Portuguese*
Joel Cahoon, *Civil Engineering*
Angela Calabrese-Barton, *Teacher Education*
Michael Casby, *Communicative Sciences & Disorders*
Joseph Cesario, *Psychology*
Christina Chan, *Chemical Engineering & Materials Science*
Hoo Sun Chung, *Biochemistry and Molecular Biology*
Todd Ciche, *Microbiology and Molecular Genetics*
Scott Clark, *Geosciences*
Hilary Clayton, *Large Animal Clinical Sciences*
Tremonte Colleen, *Comparative Cultures and Politics*
Paul Cooke, *Communication Sciences and Disorders*
Mary Jo Cooley Hidecker, *Communication Sciences and Disorders & Epidemiology*
Jane Cottingham, *World Health Organization*
Constantinos Coursaris, *Telecom, Information Studies & Media*
Tobin Craig, *International Relations*
Pero Dagbovie, *History*
Judith Danovitch, *Psychology*
Marcos Dantus, *Chemistry*
Joe Darden, *Geography*
Dele Davies, *Pediatrics and Human Development*
Angelique Day, *Social Work*
Frank Dazzo, *Microbiology and Molecular Genetics*
Jualynne Dodson, *Sociology*
Kirk Dolan, *Food Science and Human Nutrition*
Kirk Domer, *Theatre*
Reade Dornan, *English*
Daniel Dougherty, *Mathematics*
Meghan Drummond, *Human and Animal Genetics*
Lawrence Drzal, *Chemical Engineering & Materials Science*
Rita Edozie, *International Relations*
Jennifer Ekstrom, *Biochemistry*
Waseem El-Rayes, *James Madison College*
Ross Emmett, *James Madison College*
Kyle Evered, *Geography*
Emine Evered, *History*
Mohamed Faisal, *Pathobiology and Diagnostic Investigation & Fisheries and Wildlife*
Jenifer Fenton, *Nursing*
Todd Fenton, *Anthropology*
Ramona Fernandez, *Writing, Rhetoric & American Culture*
Ron Fisher, *Economics*
Michele Fluck, *Microbiology & Molecular Genetics*
Kevin Ford, *Psychology*
Eric Freedman, *Journalism*
Jon Frey, *Art and Art History*
Karen Friderici, *Microbiology and Molecular Genetics*
John Fyfe, *Microbiology and Molecular Genetics*
Kathleen Gallo, *Biochemistry*
Claudia Garcia-Moreno, *World Health Organization*
Jeanne Gazel, *Integrated Studies in Social Science*
Hope Gerde, *Family and Child Ecology*
Lynne Goldstein, *Anthropology*
Erik Goodman, *Electrical and Computer Engineering*
Julia Grant, *Social Relations & Policy*

Emily Grman, *Plant Biology*
 Matt Grossman, *Political Science*
 Daniel Guyer, *Biosystems Engineering*
 Troy Hale, *Telecom, Information Studies and Media*
 Jack Harkema, *Pathobiology and Diagnostic Investigation*
 Craig Harris, *Sociology*
 James Harrison, *Chemistry*
 Bill Hart-Davidson, *Writing, Rhetoric & American Culture*
 Janice Harte, *Food Science & Human Nutrition*
 Bob Hausinger, *Microbiology and Molecular Genetics*
 Bill Henry, *Biochemistry and Molecular Biology*
 Sharon Hoerr, *Food Science and Human Nutrition*
 Kay Holekamp, *Zoology*
 Norman Hord, *Food Science and Human Nutrition*
 Gregg Howe, *Biochemistry and Molecular Biology*
 Jie Huang, *Radiology*
 Patricia Huddleston, *Advertising, Public Relations and Retailing*
 Christopher Hunley, *Mechanical Engineering*
 David Hyndman, *Geological Sciences*
 Louise Jezierski, *Social Relations & Policy*
 Michele Johnson, *Zoology*
 Kathy Jurado, *English*
 Michael Kaplowitz, *Community, Ag, Recreation and Resource Studies*
 Leron Katsir, *Biochemistry and Molecular Biology*
 Marcella Kelly, *Virginia Polytechnic Institute and State University, Department of Fisheries and Wildlife Sciences*
 Norbert Kerr, *Psychology*
 Wasim Khaliq, *Civil Engineering*
 Ramazan Kilinc, *James Madison College*
 Andrew Kim, *Engineering*
 Lee Kroos, *Biochemistry and Molecular Biology*
 John Kruger, *Small Animal Clinical Sciences*
 Erin Kuffel, *Kinesiology*
 Min-Hao Kuo, *Biochemistry and Molecular Biology*
 Robert Laduca, *Chemistry*
 Mark Largent, *James Madison College, Lyman Briggs, History*
 Robert Larkin, *Biochemistry & Molecular Biology*
 Becky Larson, *Biosystems Engineering*
 Robert Last, *Biochemistry and Molecular Biology*
 Jennifer Lau, *Plant Biology*
 Kyunghye Lee, *Social Work*
 Richard Lenski, *Crop and Soil Sciences*
 Frederick Leong, *Psychology*
 Tim Levine, *Communication*
 Janet Lewis, *Crop and Soil Sciences*
 Michael Lewis, *History*
 Wei Liao, *Biosystems Engineering*
 Julie Libarkin, *Geosciences*
 Terry Link, *Campus Sustainability*
 John Linz, *Food Science & Human Nutrition*
 Shawn Loewen, *Linguistics and Languages*
 David Long, *Geological Sciences*
 Christian Lotz, *Philosophy*
 Joseph Luloff, *Music*
 Barbara Lundrigan, *Zoology*
 Arthur Mabiso, *Honors College*
 David MacFarlane, *Forestry*
 Maryhelen MacInnes, *Sociology*
 Linda Mansfield, *Large Animal Clinical Sciences*
 Bradley Marks, *Biosystems Engineering*
 Dan Marsh, *Telecom, Information Studies, and Media*
 Terence Marsh, *Microbiology*
 Laura McCabe, *Physiology*
 Susan Madigan McComb, *Art & Art History*
 John McCracken, *Chemistry*
 Aaron McCright, *Lyman Briggs, Sociology*
 Maureen McGee, *Art & Art History*
 Richard Merritt, *Entomology*
 Ronald Meyer, *Physiology*
 Richard Miksicek, *Physiology*
 Richard Miles, *Food Science & Human Nutrition*
 Robin Miller, *Psychology*
 Kelly Mix, *Counseling, Educational Psychology, and Special Education*
 Kelly Morrison, *Communication*
 Jennifer Mosack, *Food Science and Human Nutrition*
 Lanay Mudd, *Kinesiology and Epidemiology*
 Tina Muller, *Microbiology and Molecular Genetics*
 Scott Mulrooney, *Microbiology and Molecular Genetics*
 Alan Munn, *Linguistics & Languages*
 Ramani Narayan, *Chemical Engineering*
 Sandra Nauwelaerts, *Large Animal Clinical Sciences*
 Manish Neupane, *Comparative Medicine and Integrative Biology*
 Sarah Nicholls, *CARRS and Geography*
 Courtney North, *Small Animal Clinical Sciences*
 Justin O'Dell, *Music*
 Folu Ogundimu, *Journalism*
 Brittany O'Neal, *African American Studies*
 Katherine Osteryoung, *Plant Biology*
 Peggy Ostrom, *Zoology*
 Jeffrey Overholt, *Life Sciences*
 Amol Pavangadkar, *Journalism*
 Scott Peacor, *Fisheries and Wildlife*
 James Pestka, *Food Science and Human Nutrition*
 Karin Pfeiffer, *Kinesiology*
 James Pivarnik, *Kinesiology and Epidemiology*
 Karen Plaut, *Animal Science*
 Timothy Pleskac, *Psychology*
 Jerry Punch, *Communicative Sciences & Disorders*
 Steve Rachman, *English*
 Linda Racioppi, *James Madison College*
 Susan Ravizza, *Psychology*
 C. Adinarayana Reddy, *Microbiology & Molecular Genetics*
 Dean Rehberger, *Writing, Rhetoric, and American Culture*
 Dawn Reinhold, *Biosystems & Agricultural Engineering*
 Bryan Ritchie, *International Relations*
 Jennifer Rivera-Caudill, *CARRS*
 Carole Robinson, *Bailey Scholars Program*
 Judith Roof, *English*
 Tyrone Rooney, *Geological Sciences*
 Michele Root-Bernstein, *Theater*
 Robert Root-Bernstein, *Physiology*

Joan Rose, *Fisheries and Wildlife*
Cary Roseth, *Counseling, Educational Psychology, and Special Education*
Ludmila Roze, *Food Science & Human Nutrition*
Chong-Yu Ruan, *Physics and Astronomy*
Danielle Rudder, *Social Work*
Steve Safferman, *Biosystems & Agricultural Engineering*
Tao Sang, *Plant Biology*
Douglas Schemske, *Plant Biology*
Thomas Schmidt, *Microbiology & Molecular Genetics*
Cristina Schmitt, *Linguistics*
Tobias Schoenherr, *Supply Chain Management*
Kim Scribner, *Fisheries & Wildlife*
Barbara Sears, *Plant Biology*
John Seita, *Social Work*
Steve Sharra, *Philosophy*
Alexander Shingleton, *Zoology*
Louise Siddons, *Art & Art History*
Nathan Siegert, *Entomology*
Janice Siegford, *Animal Science*
Kami Silk, *Communication*
Animesh Sinha, *Dermatology & Cutaneous Sciences*
Cheryl Sisk, *Neuroscience*
Lori Skibbe, *Family & Child Ecology*
Jill Slade, *Radiology*
James Smith, *Entomology & Zoology*
Sandi Smith, *Communication*
Trixie Smith, *Writing Center*
Marya Sosulski, *Social Work*
Amber Springman, *Pediatrics and Human Development*
Charles Steinfield, *Telecommunication, Information Studies, and Media*
Narelle Stubbs, *Large Animal Clinical Sciences*
Paul Swartz, *Campus Grounds*
Shannon Sykes, *Nursing*
Xiaobo Tan, *Electrical and Computer Engineering*
Frank Telewski, *Plant Biology*
Michael Thomashow, *Plant Research Lab*
Laurie Thorp, *RISE*
Edith Torres-Chavolla, *Biosystems & Agricultural Engineering*
Steven Triezenberg, *Biochemistry & Molecular Biology*
Jean Tsao, *Fisheries & Wildlife*
Bruce Uhal, *Physiology*
Remke VanDam, *Geological Science*
Steven van Nocker, *Horticulture*
Mark van Ommeren, *World Health Organization*
Michael Velbel, *Geological Sciences*
Patrick Venta, *Microbiology & Molecular Genetics*
Arthur Versluis, *Religious Studies*
Anne Violin-Wigent, *French, Classics, and Italian*
Christine Vogt, *CARRS*
Suzanne Wagner, *Linguistics & Languages*
Clegg Waldron, *Microbiology & Molecular Genetics*
Clive Waldron, *Microbiology & Molecular Genetics*
Edward Walker, *Microbiology*
Kevin Walker, *Chemistry & Biochemistry and Molecular Biology*

S. Patrick Walton, *Chemical Engineering & Materials Science*
Thomas Whittam, *Microbiology and Molecular Genetics*
Barry Williams, *Zoology*
Latonya Michelle Williams, *Teacher Education*
Karen Patricia Williams, *Obstetrics, Gynecology, and Reproductive Biology*
Brian Winn, *Telecom, Information Studies & Media*
Robert Wiseman, *Physiology & Radiology*
Lily Yan, *Psychology*
Kefei Yu, *Microbiology*
Vilma Yuzbasiyan-Gurkan, *Microbiology and Molecular Genetics, Small Animal Clinical Sciences*
Tim Zacharewski, *Biochemistry & Molecular Biology*
Geri Zeldes, *Journalism*
Aklilu Zeleke, *Statistics & Probability*
Stephen Zepf, *Physics & Astronomy*
Deng Zhang, *Biosystems Engineering*

Index of Presenters

Student participants are listed alphabetically by last name.

Acho, Christine	1:30 PM - 3:30 PM Ballroom	<i>THE ROLE OF NGO0516-17 IN NEISSERIA GONORRHOEAE IN CELL SURVIVAL IN RESPONSE TO EXTRACELLULAR STRESSORS</i>	14
Aden, Justin	1:30 PM - 3:30 PM Ballroom	<i>ISOLATION OF NOVEL PLANT POLYMER DEGRADERS FOR USE IN BIOFUEL PRODUCTION</i>	47
Adrian, Alexander	1:30 PM - 3:30 PM Ballroom	<i>INVESTIGATING THE PRESENCE OF A BACTERIAL ENDOSYMBIONT IN THE NEMATODE TRICHURIS MURIS</i>	14
Ahmad, Tiara	9:30 AM - 11:30 AM Ballroom	<i>FUNCTIONAL MRI USING VASCULAR SPACE OCCUPANCY (VASO) AND VASCULAR SPACE OCCUPANCY WITH TISSUE SUPPRESSION (VAST)</i>	33
Ahmad Hisham, Afiqah	9:30 AM - 11:30 AM Ballroom	<i>USING FORWARD AND REVERSE GENETIC APPROACHES TO IDENTIFY PLASTID DIVISION COMPONENTS</i>	76
Ahmad Hisham, Afiqah	1:30 PM - 3:30 PM Ballroom	<i>EXPLORING ANTS UNDER THE SEM</i>	14
Albers, Alexandra	10:15 AM Lake Erie Room	<i>CHANGES IN EDUCATION AND ATTITUDE: A POST-CONFLICT LOOK AT IRELAND'S BORDER REGION</i>	14
Aldrich, Tamar	9:30 AM - 11:30 AM Gold Room	<i>WHAT IS THE EPISTEMOLOGY IF ANCIENT ORNITHIACA: HOW DO WE KNOW WHAT WE KNOW ABOUT ANCIENT BIRDS?</i>	14
Ali, Sagal	9:30 AM - 11:30 AM Ballroom	<i>FUNCTIONAL MRI USING VASCULAR SPACE OCCUPANCY (VASO) AND VASCULAR SPACE OCCUPANCY WITH TISSUE SUPPRESSION (VAST)</i>	33
Allen, Julia	9:30 AM Parlor A	<i>CREATIVE WRITING: WRITING CENTERS- WORKSHOPPING IN NEW WAYS</i>	14
Allen, Whitney	1:30 PM - 3:30 PM Gold Room	<i>INERTIAL PROPERTIES OF BODY SEGMENTS OF THE HORSE, EQUUS CABBALUS</i>	15
Alzahabi, Reem	1:30 PM - 3:30 PM Gold Room	<i>WHAT KINDS OF INFORMATION DO CHILDREN SHARE WITH OTHERS?</i>	15
Amey, Kyla	2:45 PM Lake Huron Room	<i>EFFECTIVE POPULATION SIZE IN THE LANDRACE BREED</i>	15
Anderson, Kyle	9:30 AM - 11:30 AM Ballroom	<i>POST PROCESSING MICROBIAL CONTROL OF PEELED CHESTNUTS</i>	86
Andrzejak, Megan	1:30 PM - 3:30 PM Ballroom	<i>IDENTIFICATION OF RESIDUES ESSENTIAL FOR DNA LYASE ACTIVITY SPECIFIC TO ABASIC SITES IN HUMAN ABH1</i>	15
Arnold, Steve	9:30 AM - 11:30 AM Gold Room	<i>PHANTOM ENERGY WASTE IN UNIVERSITY HOUSING</i>	40
Artymovich, Katherine	1:30 PM - 3:30 PM Gold Room	<i>CRE-1 BINDING PROTEIN IS A POTENTIAL TARGET FOR CONTROLLING AFLATOXIN CONTAMINATION IN FOOD CROPS</i>	15

Audette-Bauman, Claire	1:30 PM - 3:30 PM Ballroom	<i>OPTIMIZING WAYFINDING IN TRANSIT CENTERS</i>	16
Audette-Bauman, Claire	9:30 AM - 11:30 AM Ballroom	<i>THE EFFECTS OF TAGLINES ON CLICK-THROUGH RATES: MOBILE ADVERTISING</i>	81
Babcock, Lori	1:00 PM Lake Huron Room	<i>FIELD VALIDATION OF THE FISHXING MODEL</i>	16
Baker, Brittany	9:30 AM - 11:30 AM Gold Room	<i>THE USE OF COLOR AS AN IMPLICIT RESTRICTION IN CHILD'S LANGUAGE</i>	16
Baker, Nicole	9:30 AM - 11:30 AM Ballroom	<i>CLONING AND EXPRESSION OF A TRYPANOSOMAL PENTATRICOPEPTIDE REPEAT PROTEIN</i>	16
Baldwin, Carolyn	10:30 AM Tower Room	<i>REDUCE, REUSE, BE SPARTAN GREEN</i>	17
Balowski, Aaron	9:30 AM - 11:30 AM Ballroom	<i>POLYMATHY OF NOBEL PEACE PRIZE LAUREATES</i>	17
Bambach, Matthew	1:45 PM Lake Superior Room	<i>UTILIZING AUTODESK MAYA 2008 TO CREATE AN IMMERSIVE THREE-DIMENSIONAL EXPERIENCE FOR A THEATRICAL SETTING</i>	17
Baranski, Marci	9:30 AM - 11:30 AM Gold Room	<i>BRAC'S POST-CYCLONE SIDR AGRICULTURE REHABILITATION PROGRAMME: AN IMPACT EVALUATION</i>	17
Barkell, Matthew	9:30 AM - 11:30 AM Ballroom	<i>THE REAL COSTS OF BANKRUPTCY IN THE UNITED STATES</i>	17
Barnett, Joshua	10:00 AM Tower Room	<i>COCKNEY RHYMING SLANG</i>	78
Barnett, Joshua	11:45 AM Tower Room	<i>MEANTIME</i>	78
Bartholomew, Sarah	10:30 AM Parlor C	<i>PHYSICAL ACTIVITY DURING PREGNANCY AND CHILD BODY SIZE AT 8-10 YEARS</i>	17
Bates, Karen	10:00 AM Lake Huron Room	<i>FUNCTIONAL MRI USING VASCULAR SPACE OCCUPANCY (VASO) AND VASCULAR SPACE OCCUPANCY WITH TISSUE SUPPRESSION (VAST)</i>	69
Baum, Zachary	9:30 AM - 11:30 AM Gold Room	<i>EXPLORING SCIENTIFIC AND ARTISTIC APTITUDE</i>	83
Bawden, Julia	1:30 PM - 3:30 PM Ballroom	<i>THE EFFECT OF MEDICAL TRUST IN THE KINKEEPERSM PROGRAM: COMMUNITY HEALTH WORKER PERSPECTIVE</i>	44
Bayisetti, Padmini	1:30 PM - 3:30 PM Ballroom	<i>COMMUNITY HEALTH RESEARCH</i>	18
Be, Austin	1:30 PM - 3:30 PM Ballroom	<i>ANALYSIS OF A PUTATIVE CHLOROPLAST DIVISION GENE, SSZ1</i>	18
Beach, LeighAnna	11:15 AM Parlor B	<i>MANAGEMENT OF RESIDENTIAL NATURAL RESOURCES BY RECENT RURAL IN-MIGRANTS</i>	18

Beagley, Jonathan	1:00 PM Parlor A	<i>LINGUISTIC VARIATION OF THE POSITION OF OBJECT PRONOUNS IN SOUTHERN FRENCH</i>	18
Beck, Chelsea	9:45 AM Parlor A	<i>THE ESSENCE OF IMAGES</i>	80
Berry, Garrett	1:30 PM - 3:30 PM Ballroom	<i>ANALYSIS OF A TRANSCRIPTIONAL MECHANISM IN HIGHER PLANT DEVELOPMENT</i>	19
Bilsborrow, Joshua	12:00 Noon Lake Huron Room	<i>DKR: ENHANCED CONVERSION OF ALPHA-ARYLALANINES TO BETA-ARYLALANINES VIA COUPLED RACEMASE-PAM REACTION</i>	19
Bird, Lindsey	9:30 AM - 11:30 AM Gold Room	<i>TESTING SIZE AS AN IMPLICIT RESTRICTION ON THE DEFINITE ARTICLE IN CHILD LANGUAGE</i>	30
Bissett, Megan	1:30 PM - 3:30 PM Gold Room	<i>WHAT KINDS OF INFORMATION DO CHILDREN SHARE WITH OTHERS?</i>	15
Blaine, Allison	1:30 PM - 3:30 PM Ballroom	<i>NOVEL SPECTINOMYCIN RESISTANT MUTATIONS IN CHLAMYDOMONAS REINHARDTII</i>	19
Blanco, Carolyn	9:30 AM - 11:30 AM Gold Room	<i>CHILDREN LEARNING OJIBWE IN A SCHOOL SETTING</i>	62
Blanco, Carolyn	1:30 PM - 3:30 PM Gold Room	<i>SCALE COMPETITION AND CHILDREN'S UNDERSTANDING OF GRADABLE ADJECTIVES</i>	30
Blaney, Jeremy	11:15 AM Lake Erie Room	<i>THROUGH THE MEDIAS LENS REPRESENTING THE 2003 IRAQ WAR</i>	19
Bonnen, Kathryn	9:30 AM - 11:30 AM Gold Room	<i>OUTLIERS: HOW THEY INFORM RESEARCH IN EDUCATION</i>	19
Bornhorst, Ellen	1:30 PM - 3:30 PM Ballroom	<i>EFFECT OF FREEZE DRYING AND HOT-AIR DRYING ON TOTAL ANTHOCYANINS IN TART CHERRY POMACE POWDER</i>	20
Borycki, Kelly	1:30 PM - 3:30 PM Ballroom	<i>ISOLATION OF NOVEL PLANT POLYMER DEGRADERS FOR USE IN BIOFUEL PRODUCTION</i>	47
Botting, Carolyn	9:30 AM - 11:30 AM Gold Room	<i>INFLUENCE OF GENDER ON CORTICAL ACTIVATION</i>	20
Boychuck, Nina	1:30 PM - 3:30 PM Gold Room	<i>DOES THE ABILITY TO CRACK BONE IN ADULTHOOD SLOW SKULL DEVELOPMENT?</i>	89
Brandt, Erin	9:30 AM - 11:30 AM Ballroom	<i>OPEN CHARACTER BUILDER</i>	80
Brecklin, Caitlin	9:30 AM - 11:30 AM Gold Room	<i>CURRICULUM ADAPTATION AND MERGING WORLDS IN MIDDLE SCHOOL SCIENCE EDUCATION</i>	20
Breen, Patrick	9:30 AM - 11:30 AM Ballroom	<i>ESTIMATION OF THERMAL DIFFUSIVITY OF CHERRY POMACE AT HIGH TEMPERATURES</i>	20
Briggs, Christian	9:30 AM - 11:30 AM Gold Room	<i>SILICIC VOLCANICS IN THE SOUTH MOUNTAIN REGION: A VOLCANIC CENTER ASSOCIATED WITH THE BREAKUP OF RODINIA</i>	20

Brimmeier, Danielle	9:30 AM - 11:30 AM Gold Room	<i>THE EFFECTS OF INTERNET EXPERIENCE ON CHILDREN'S PERCEPTIONS OF INFORMATION</i>	35
Brink, Wouter	1:30 PM - 3:30 PM Ballroom	<i>MODULAR PAVEMENTS</i>	21
Bristle, Andrew	2:00 PM Lake Erie Room	<i>THE IMPLICATIONS OF ELIMINATING THE PROPERTY TAX</i>	69
Brosius, Jacqueline	9:30 AM - 11:30 AM Ballroom	<i>DETERMINING COFACTOR ASSOCIATION WITH KNIRPS DURING WING VEIN DEVELOPMENT</i>	21
Brown, Alexander	11:15 AM Lake Huron Room	<i>COMPARING AP-1 AND ETS ACTIVATION LEVELS IN MAMMARY CELLS TRANSFORMED WITH THE MIDDLE T ONCOPROTEIN AND KEY MUTANTS</i>	21
Brunton, Jason	9:30 AM - 11:30 AM Ballroom	<i>SYNTHETIC GENE DESIGN OF TYPE THREE SECRETION SYSTEM NEEDLE PROTEIN HRPA TO ENHANCE CRYSTALLIZATION</i>	21
Buchholtz, Rebecca	9:30 AM - 11:30 AM Ballroom	<i>CONSEQUENCES OF UNIVERSAL VACCINATION FOR VARICELLA</i>	45
Bul, Lauren	1:30 PM - 3:30 PM Ballroom	<i>SPECIFICITY TESTING OF AN ELECTROCHEMICAL BIOSENSOR FOR THE DETECTION OF ESCHERICHIA COLI O157:H7</i>	21
Burden, Dustin	1:30 PM Parlor A	<i>BODY THEORY, A COLLECTION OF CRITICAL AND CREATIVE RESOURCES</i>	22
Burdick, Jessica	1:30 PM - 3:30 PM Gold Room	<i>A STUDY OF LETTER NAME KNOWLEDGE</i>	64
Burg, Ashley	1:30 PM - 3:30 PM Ballroom	<i>COMPARATIVE TOXICOECONOMICS OF TCDD AND TCDF-ELICITED EFFECTS IN MICE: EROD ANALYSIS AND EVALUATION OF TCDF TOXIC EQUIVALENCY FACTOR (TEF)</i>	22
Burkholder, Allison	1:30 PM - 3:30 PM Gold Room	<i>UNCOVERING THE SILENCE: YOUNG WOMEN INVISIBLE IN SUDAN'S CIVIL WAR</i>	71
Butterfield, Erik	1:30 PM - 3:30 PM Gold Room	<i>IMPLICIT RESTRICTIONS IN ADULT LANGUAGE</i>	26
Caldwell, John	9:30 AM - 11:30 AM Ballroom	<i>THE ROLE OF THE STAGA AND TFIID COMPLEXES IN TRANSCRIPTIONAL ACTIVATION DURING HSV-1 INFECTION</i>	22
Campbell, Amy	9:30 AM - 11:30 AM Gold Room	<i>BRAIN RESPONSES UNDERLYING CIRCADIAN RHYTHM DISRUPTION</i>	22
Campbell, Danielle	10:00 AM Parlor A	<i>WARHOL: A CRITICAL ANALYSIS</i>	67
Campbell, Emily	9:30 AM - 11:30 AM Gold Room	<i>PHANTOM ENERGY WASTE IN UNIVERSITY HOUSING</i>	40
Campbell, Erin	10:30 AM Lake Superior Room	<i>EVOLUTION FOR EVERYONE</i>	61
Carlson, David	9:30 AM - 11:30 AM Ballroom	<i>DOING BUSINESS IN THE UNITED STATES: STARTING A BUSINESS</i>	70

Carr, David	1:30 PM - 3:30 PM Ballroom	<i>HEAVY METAL DETECTION USING A SCREEN PRINTED CARBON ELECTRODE</i>	22
Castro, Brian	1:30 PM - 3:30 PM Ballroom	<i>APTAMER SELECTION FOR MICROORGANISM DETECTION</i>	22
Chagas, Cristian	9:30 AM - 11:30 AM Ballroom	<i>COORDINATED ORGAN DEVELOPMENT IN DROSOPHILA LARVAE</i>	23
Charbonneau, Mark	9:30 AM - 11:30 AM Gold Room	<i>TRICHODERMA-ENHANCED ROOT NODULATION IN GARDEN BEANS AND CHARACTERIZATION OF MICROBIAL DIVERSITY IN THE NODULES</i>	23
Chomsky, Madison	10:00 AM Lake Huron Room	<i>FUNCTIONAL MRI USING VASCULAR SPACE OCCUPANCY (VASO) AND VASCULAR SPACE OCCUPANCY WITH TISSUE SUPPRESSION (VAST)</i>	69
Christensen, Erica	1:30 PM - 3:30 PM Gold Room	<i>PATTERNS OF SKULL DEVELOPMENT IN WILD CARNIVORES</i>	26
Christian, Carla	1:30 PM - 3:30 PM Ballroom	<i>REDEFINING BIOAVAILABILITY</i>	45
Church, Zachary	1:30 PM - 3:30 PM Ballroom	<i>INTELLIGENT VEHICLE INFORMATION SYSTEMS</i>	23
Church, Zachary	9:30 AM - 11:30 AM Ballroom	<i>THE EFFECTS OF TAGLINES ON CLICK-THROUGH RATES: MOBILE ADVERTISING</i>	81
Cirino, Jennifer	1:30 PM - 3:30 PM Gold Room	<i>THE USE OF ELECTRO-TRANSFORMATION FOR INSERTION OF RESISTANCE GENES INTO PHASEOLUS VULGARIS</i>	23
Clark, Stacie	1:30 PM - 3:30 PM Gold Room	<i>VACCINES AND BIOTERRORISM</i>	23
Coku, Ardian	9:30 AM - 11:30 AM Ballroom	<i>ELUCIDATING THE ROLE OF A NOVEL DNAJ-LIKE PROTEIN IN FATTY ACID METABOLISM WITHIN THE CHLOROPLAST</i>	24
Coleman, Kayla	9:30 AM - 11:30 AM Gold Room	<i>EXPLORING ENERGY USE AND CONSERVATION POTENTIAL IN MSU SCIENCE LABORATORIES</i>	24
Collings, Cynthia	9:30 AM - 11:30 AM Ballroom	<i>THE ROLE OF PHOTOPERIOD IN COLD ACCLIMATION</i>	24
Colunga-Santoyo, Sara	9:30 AM - 11:30 AM Ballroom	<i>CONSUMER RESPONSE TO MOBILE ADVERTISING TARGETED BY LOCATION AND PROXIMITY</i>	61
Colunga-Santoyo, Sara	1:30 PM - 3:30 PM Ballroom	<i>EXPLORING PERCEPTIONS OF USABILITY IN PUBLIC TRANSPORTATION</i>	24
Connolly, J. Cory	10:30 AM Parlor B	<i>RENEWABLE ENERGY FOR MICHIGAN SCHOOLS</i>	24
Constantine, Nick	11:15 AM Tower Room	<i>HIGH STEP: A Story of the Spartan Marching Band</i>	83
Cook, Virginia	11:00 AM Lake Huron Room	<i>EXPRESSION OF ATP BINDING CASSETTE TRANSPORTERS IN CANINE OSTEOSARCOMAS</i>	25

Cooke, Thomas	9:30 AM - 11:30 AM Ballroom	<i>A STABILIZED SPLICE VARIANT OF THE JASMONATE ZIM-DOMAIN PROTEIN JAZ10 REPRESSES JASMONATE SIGNALLING IN ARABIDOPSIS</i>	25
Cooper, David	10:15 AM Tower Room	<i>MSU TELECASTERS THE SHOW</i>	25
Cooper, David	12:00 Noon Tower Room	<i>BOOK TRAILER: ASSASSINATION VACATION BY SARAH VOWELL</i>	25
Corlett, Brad	9:45 AM Tower Room	<i>ELDERLY INSTRUMENTS DOCUMENTARY</i>	25
Corlett, Brad	10:30 AM Tower Room	<i>REDUCE, REUSE, BE SPARTAN GREEN</i>	17
Corriveau, Peter	11:15 AM Tower Room	<i>HIGH STEP: A STORY OF THE SPARTAN MARCHING BAND</i>	83
Cottrill, Sara	2:00 PM Tower Room	<i>PREDICTORS OF HIV-RISK BEHAVIOR AMONG YOUNG MEN WHO HAVE SEX WITH MEN IN DETROIT</i>	25
Cousin, Natalie	1:45 PM Lake Huron Room	<i>MECHANICS TRANSITIONS IN HORSES</i>	26
Cox, Steven	1:00 PM Tower Room	<i>FUNCTIONAL ANATOMY OF READING STORIES VERSUS SOLVING MATH PROBLEMS USING FMRI</i>	26
Crechiolo, Michelle	11:00 AM Lake Superior Room	<i>ENTERTAINMENT AND CULTURE IN JAPAN AND ZAMBIA</i>	26
Cronin, Amy	1:30 PM - 3:30 PM Gold Room	<i>IMPLICIT RESTRICTIONS IN ADULT LANGUAGE</i>	26
Cunningham, Stephanie	1:30 PM - 3:30 PM Gold Room	<i>PATTERNS OF SKULL DEVELOPMENT IN WILD CARNIVORES</i>	26
Currier, Stephanie	9:30 AM - 11:30 AM Ballroom	<i>DISASTER PREPAREDNESS FOR INDIVIDUALS WITH COMMUNICATION CHALLENGES</i>	26
Curtis, Gannon	1:30 PM - 3:30 PM Gold Room	<i>MAMMALIAN SKULL DEVELOPMENT</i>	79
Czarnik, Allison	9:30 AM - 11:30 AM Gold Room	<i>A NEW DOG PARK IN INGHAM COUNTY: UNLEASHING THE POSSIBILITIES</i>	27
Dang, My-Trang	9:30 AM - 11:30 AM Ballroom	<i>FUNCTIONAL GENOMICS OF SYMBIOTIC GENES IN NEMATODE HETERORHABDITIS BACTERIOPHORA USING RNAI</i>	27
Daum, Kristen	11:15 AM Lake Superior Room	<i>DIVERSITY OF ETHNICITY IN ENTERTAINMENT AND CULTURE BETWEEN THE UNITED STATES AND JAPAN</i>	27
Davis, Bethany	9:30 AM - 11:30 AM Ballroom	<i>IMPROVING THE FACEBOOK MOBILE INTERFACE TO INCREASE USABILITY</i>	28
Davis, Bethany	1:30 PM - 3:30 PM Ballroom	<i>TEXT AND IMAGE DENSITY EFFECTS ON WEB USABILITY</i>	27

Davis, Jeremy	10:30 AM Lake Superior Room	<i>EVOLUTION FOR EVERYONE</i>	61
Davis V, Thomas	1:30 PM - 3:30 PM Ballroom	<i>CHARACTERIZING AND OPTIMIZING A PREDICTIVE FRAMEWORK FOR WINE PRODUCTION USING A COLLABORATIVE INTERNET DATABASE OF COMPLEX BUFFERS</i>	27
Dean, Marleah	1:30 PM - 3:30 PM Gold Room	<i>CROSS-CULTURAL DECEPTION</i>	28
Dean, Marleah	9:30 AM Parlor C	<i>CONTENT ANALYSIS OF BREAST CANCER WEBSITES</i>	28
Decker, Noel	9:30 AM - 11:30 AM Ballroom	<i>ISOLATION OF NOVEL BACTERIA THAT ARE CAPABLE OF USING UNIQUE CARBON SOURCES AND THEIR ROLE IN BIOENERGY</i>	28
DeLoach, Jessica	9:30 AM - 11:30 AM Ballroom	<i>MICHIGAN POLICY NETWORK</i>	28
Derian-Toth, Meredith	1:15 PM Tower Room	<i>EQUAL PAY FOR EQUAL PLAY: DEVELOPMENTAL CHANGE IN YOUNG CHILDRENS FAIRNESS CONCERNS AND COOPERATION</i>	29
DeVries, Karl	9:30 AM - 11:30 AM Gold Room	<i>CHILD AND ADULT USE OF PROSODY IN SYNTACTIC DISAMBIGUATION</i>	80
DeVries, Karl	1:30 PM - 3:30 PM Gold Room	<i>STATISTICAL PROPERTIES IN DETERMINING THE APPLICATION OF 'TALL' AND 'SHORT'</i>	29
Dhandha, Maulik	9:30 AM - 11:30 AM Gold Room	<i>EXPLORING ENERGY USE AND CONSERVATION POTENTIAL IN MSU SCIENCE LABORATORIES</i>	24
Dhandha, Maulik	1:30 PM - 3:30 PM Ballroom	<i>DISTINCT AUTOANTIBODY SUBTYPE PROFILES CORRELATE WITH DEFINED CLINICAL SUBGROUPS IN PEMPHIGUS VULGARIS</i>	29
Diamantoni, Brittany	10:30 AM Lake Superior Room	<i>EVOLUTION FOR EVERYONE</i>	61
Diebold, Alicia	9:30 AM - 11:30 AM Ballroom	<i>MENTAL HEALTH CONCERNS OF FOSTER CARE ALUMNI</i>	29
Diedrich, Jonathan	1:30 PM - 3:30 PM Gold Room	<i>THE BROWN HYENA</i>	29
Dik, May	1:30 PM - 3:30 PM Gold Room	<i>EFFECT OF SOCIAL FACILITATION ON DEVELOPMENT OF FOOD PREFERENCE AND ACCEPTANCE IN YOUNG BEEF CATTLE</i>	30
Dingwell, Nicole	1:30 PM - 3:30 PM Gold Room	<i>CHILDCARE AFTER WELFARE REFORM</i>	30
Dinh, Thao	1:30 PM - 3:30 PM Gold Room	<i>SCALE COMPETITION AND CHILDREN'S UNDERSTANDING OF GRADABLE ADJECTIVES</i>	30
Dinh, Thao	9:30 AM - 11:30 AM Gold Room	<i>CHILD AND ADULT USE OF PROSODY IN SYNTACTIC DISAMBIGUATION</i>	80
Dixon, Erin	9:30 AM - 11:30 AM Gold Room	<i>TESTING SIZE AS AN IMPLICIT RESTRICTION ON THE DEFINITE ARTICLE IN CHILD LANGUAGE</i>	30

Dodgson, Stacie	9:30 AM - 11:30 AM Ballroom	<i>INVESTIGATION OF THE GENETIC BASIS OF COBALAMIN MALABSORPTION IN HUNGARIAN KOMONDORS</i>	30
Doering, Malcom	9:45 AM Green Room	<i>I PROBABLY WOULD PUT PROBABLY SECOND: PRE-AUXILIARY ADVERBS IN AMERICAN ENGLISH</i>	32
Domino, Deanna	10:00 AM Parlor A	<i>WARHOL: A CRITICAL ANALYSIS</i>	67
Dorn, Lauren	1:30 PM - 3:30 PM Ballroom	<i>RECOMBINEERING</i>	31
Dowgiell, David	11:00 AM Lake Superior Room	<i>ENTERTAINMENT AND CULTURE IN JAPAN AND ZAMBIA</i>	26
Dowty, Kelsey	1:30 PM - 3:30 PM Gold Room	<i>HEAD START EVALUATION</i>	31
Dupnack, Jessica	1:30 PM - 3:30 PM Ballroom	<i>ENTERTAINMENT AND CULURE IN MOROCCO AND CANADA</i>	32
Durak, Matthew	9:30 AM - 11:30 AM Ballroom	<i>A GENETIC ALGORITHM APPLIED TO AN AGENT BASED TRAFFIC MODEL</i>	31
Dvorak, Anna	1:30 PM - 3:30 PM Ballroom	<i>THE VARIATION IN THE NUMBER OF FACETS IN THE EYES OF DROSOPHILA MELANOGASTER</i>	31
Eby, Carrie	1:15 PM Tower Room	<i>EQUAL PAY FOR EQUAL PLAY: DEVELOPMENTAL CHANGE IN YOUNG CHILDRENS FAIRNESS CONCERNS AND COOPERATION</i>	29
Efevbera, Yvette	2:00 PM Green Room	<i>WHAT'S HAPPENING TO UGANDA'S CHILDREN? THE EFFECTS OF WAR ON YOUTH CULTURE IN NORTHERN UGANDA</i>	31
Eggleston, Jeffrey	9:30 AM - 11:30 AM Gold Room	<i>DETERMINING CONTINUOUS SNOW THERMAL CHARACTERISTICS WITH A NOVEL SNOW THICKNESS GAUGE</i>	31
Egner, Alyse	1:30 PM - 3:30 PM Ballroom	<i>ANALYSIS OF VEGETATED FILTER STRIPS IN TREATMENT OF AGRICULTURAL RUNOFF</i>	32
Ejups, Lara	9:30 AM - 11:30 AM Ballroom	<i>GEOGRAPHIC RACIAL EQUALITY: BLACKS VERSUS WHITES IN THE COUNTIES OF NEW YORK</i>	32
Elliot, David	9:30 AM - 11:30 AM Ballroom	<i>THE EFFECTS OF TAGLINES ON CLICK-THROUGH RATES: MOBILE ADVERTISING</i>	81
Ermak, Lisa	1:30 PM - 3:30 PM Ballroom	<i>ENTERTAINMENT AND CULURE IN MOROCCO AND CANADA</i>	32
Etzcorn, Ryan	10:45 AM Lake Erie Room	<i>THE STING OF ASIA'S 'GRANARY': ADMINISTRATIVE AND ECONOMIC INCONGRUENCIES WITH THE ENVIRONMENT IN JAPANESE MANCHURIA</i>	32
Evrard, August	9:45 AM Green Room	<i>I PROBABLY WOULD PUT PROBABLY SECOND: PRE-AUXILIARY ADVERBS IN AMERICAN ENGLISH</i>	32
Farnum, Gregory	9:30 AM - 11:30 AM Gold Room	<i>METAL AND SUBSTITUENT DEPENDENCE OF COORDINATION POLYMER STRUCTURE INCORPORATING ALKYL MALONATE LIGANDS AND A KINKED ORGANDIIMINE</i>	33

Farnum, Rebecca	9:30 AM - 11:30 AM Ballroom	<i>FEEDING PEACE: THE HISTORY OF AFRICAN FAMINE RELIEF IN THE EAST LANSING, LANSING, AND MSU COMMUNITIES</i>	33
Fassia, Mohammad	1:30 PM - 3:30 PM Ballroom	<i>MICROARRAY ANALYSIS OF INDUCIBLE MIXED-LINEAGE KINASE 3 MCF10A CELLS</i>	33
Fedorko, Alyssa	9:30 AM - 11:30 AM Ballroom	<i>FUNCTIONAL MRI USING VASCULAR SPACE OCCUPANCY (VASO) AND VASCULAR SPACE OCCUPANCY WITH TISSUE SUPPRESSION (VAST)</i>	33
Feldscher, Kyle	2:15 PM Lake Superior Room	<i>GLOBALIZATION AND THE MEXICAN PRESS</i>	41
Ferry, Danielle	10:00 AM Lake Erie Room	<i>UNIVERSITY-INDUSTRY LINKAGES: A TAXONOMY</i>	33
Finlayson, Valerie	1:30 PM - 3:30 PM Gold Room	<i>APLITE DIKES AT ELLIOT LAKE, ONTARIO, CANADA AND THEIR EFFECT ON URANIUM MINERALIZATION</i>	33
Fischer, Jason	10:15 AM Parlor B	<i>SPINE INDUCTION OF THE SPINY WATER FLEA (BYTHOTREPHES LONGIMANUS)</i>	34
Fisher, Caitlin	10:15 AM Parlor C	<i>UNDERSTANDING KEY COMPONENTS OF NUTRITION ENVIRONMENTS, POLICIES AND PROGRAMS IN SCHOOLS AND THEIR IMPACT ON STUDENTS DIETS</i>	57
Fitzgerald, Brenna	9:30 AM - 11:30 AM Ballroom	<i>EFFECTS OF DIETARY COMPOUNDS ON PROLIFERATION IN AN INTESTINAL CELL CULTURE MODEL</i>	34
Fleming, Carly	9:30 AM - 11:30 AM Ballroom	<i>IMPROVING THE FACEBOOK MOBILE INTERFACE TO INCREASE USABILITY</i>	28
Fleming, Carly	9:30 AM - 11:30 AM Ballroom	<i>USABILITY AND ACCEPTANCE OF A CONVERSATIONAL IN-CAR SPOKEN DIALOGUE SYSTEM</i>	34
Flessland, Natalie	1:30 PM - 3:30 PM Ballroom	<i>SELECTING AN OPTIMAL LOCATION FOR AN EXPANDING FOOD FRANCHISE</i>	38
Forbes, Krystle	11:15 AM Lake Erie Room	<i>THROUGH THE MEDIAS LENS REPRESENTING THE 2003 IRAQ WAR</i>	19
Fox, Martin	9:30 AM - 11:30 AM Ballroom	<i>THE CHICAGO WORKSHOP MODEL: NORMALIZING OR FRAGMENTING SCIENTIFIC COLLABORATION?</i>	48
Fraser, Katie	9:45 AM Green Room	<i>I PROBABLY WOULD PUT PROBABLY SECOND: PRE-AUXILIARY ADVERBS IN AMERICAN ENGLISH</i>	32
Fratta, Gabriela	9:30 AM - 11:30 AM Gold Room	<i>ENVIRONMENTALLY FRIENDLY PRODUCTS: IMPLEMENTING SUSTAINABLE PURCHASING IN MSU UNIVERSITY STORES</i>	37
Frear, Rebecca	1:30 PM - 3:30 PM Ballroom	<i>BIOPLASTICS</i>	34
Freiberger, Kirsten	1:30 PM - 3:30 PM Ballroom	<i>UNDERGRADUATE FOOD PREFERENCES IN YAKELEY DINING HALL</i>	34
Friederichs, Robert	9:30 AM - 11:30 AM Ballroom	<i>WEAR PROPERTIES AND BIOCOMPATIBILITY OF AMORPHOUS DIAMOND-LIKE CARBON COATINGS FOR IMPROVED ORTHOPEDIC IMPLANTS</i>	35

Gabriels, James	9:30 AM - 11:30 AM Gold Room	<i>THE EFFECTS OF INTERNET EXPERIENCE ON CHILDREN'S PERCEPTIONS OF INFORMATION</i>	35
Gaddy, Gregg	10:00 AM Tower Room	<i>COCKNEY RHYMING SLANG</i>	78
Gao, Xu	1:30 PM - 3:30 PM Ballroom	<i>DISCOVERING NEW MOLECULAR PATHWAYS IN THE REGULATION OF APOPTOSIS IN ALVEOLAR EPITHELIAL CELLS</i>	35
Gardner, Brianna	10:15 AM Tower Room	<i>MSU TELECASTERS THE SHOW</i>	25
Gebhart, Megan	9:30 AM - 11:30 AM Gold Room	<i>PHANTOM ENERGY WASTE IN UNIVERSITY HOUSING</i>	40
Ghaly, Alexandra	1:15 PM Lake Superior Room	<i>STEEL: HOT METAL, COLD REALITY</i>	58
Gill, Liza	1:30 PM - 3:30 PM Ballroom	<i>PEMPHIGUS VULGARIS DIFFERS AMONG MALES AND FEMALES</i>	75
Gillingham, Shawn	2:15 PM Lake Erie Room	<i>MICHIGAN POLICY NETWORK</i>	35
Ginsberg, Landon	10:00 AM Green Room	<i>DIRECT-TO-CONSUMER ADVERTISING OF GARDASIL</i>	43
Giuffre, Samatha	9:45 AM Green Room	<i>I PROBABLY WOULD PUT PROBABLY SECOND: PRE-AUXILIARY ADVERBS IN AMERICAN ENGLISH</i>	32
Glinke, Lauren	1:00 PM Parlor C	<i>PERFORMANCE GENEALOGY: ARTS THROUGH THE AGES</i>	42
Gluski, Courtney	9:30 AM - 11:30 AM Gold Room	<i>INCIDENTAL VERSES INTENTIONAL VOCABULARY LEARNING IN A FOREIGN LANGUAGE CLASSROOM</i>	35
Goins, Jenna	9:30 AM - 11:30 AM Ballroom	<i>SOVIET REPRESENTATIONS OF THE TRUMAN DOCTRINE</i>	36
Goldblatt, Kelley	9:30 AM - 11:30 AM Gold Room	<i>CUTMARK EXAMINATIONS</i>	36
Goldman, Nicole	1:30 PM - 3:30 PM Ballroom	<i>DEVELOPMENT OF CRACKERS WITH A SERVING OF VEGETABLES</i>	36
Goralski, Peter	9:30 AM - 11:30 AM Ballroom	<i>MICHIGAN POLICY NETWORK</i>	36
Gorte, Stephanie	10:15 AM Parlor C	<i>UNDERSTANDING KEY COMPONENTS OF NUTRITION ENVIRONMENTS, POLICIES AND PROGRAMS IN SCHOOLS AND THEIR IMPACT ON STUDENTS DIETS</i>	57
Goud, Sneha	2:30 PM Lake Erie Room	<i>TRACEABILITY IN THE US VS EU FOOD CHAIN AND ITS IMPACT AT MICHIGAN STATE UNIVERSITY</i>	36
Grambaugh, Katherine	1:30 PM - 3:30 PM Gold Room	<i>THE BROWN HYENA</i>	29

Gray, Richard	1:30 PM - 3:30 PM Ballroom	<i>ANALYSIS OF THE VIRULENCE AND VIRULENCE FACTORS OF BURKHOLDERIA CENOCEPACIA BACTERIA USING THE NEMATODE CAENORHABDITIS ELEGANS AS A MODEL HOST</i>	36
Green, Alisha	2:00 PM Lake Superior Room	<i>USING MULTIMEDIA TO ASSIST FARMERS IN INTERACTIONS WITH THE THAI COMMUNITY THROUGH THE WEB SITE SUSTAINABLE FARMER</i>	37
Greig, Jacqueline	9:30 AM - 11:30 AM Gold Room	<i>ENVIRONMENTALLY FRIENDLY PRODUCTS: IMPLEMENTING SUSTAINABLE PURCHASING IN MSU UNIVERSITY STORES</i>	37
Grenzicki, Lauren	1:30 PM - 3:30 PM Ballroom	<i>CRYSTALLOGRAPHIC STUDY OF COP8 SIGNALOSOME SUBUNIT 8 (CSN8)</i>	37
Griffin, Amanda	9:30 AM - 11:30 AM Gold Room	<i>THE EFFECTS OF VARIOUS LEVELS OF SCAFFOLDING ON SEVENTH GRADE STUDENTS SCIENCE LEARNING OF HEREDITY</i>	37
Guikema, Katie	10:30 AM Lake Superior Room	<i>EVOLUTION FOR EVERYONE</i>	61
Gurney, Tera	1:30 PM - 3:30 PM Gold Room	<i>RELATIONSHIP BETWEEN CHILDREN'S DEVELOPMENT OF WRITING AND KNOWLEDGE OF LETTERS ACROSS THE FALL SEMESTER OF PRESCHOOL</i>	37
Guzzardo, Anthony	1:30 PM - 3:30 PM Ballroom	<i>GENETIC ANALYSIS OF THE RESPONSE TO AIRWAY IRRITATION IN A RODENT MODEL</i>	38
Haas, Wonder	9:30 AM - 11:30 AM Ballroom	<i>GEOGRAPHIC RACIAL EQUALITY: A LOOK AT HISPANICS AND WHITES IN PUEBLO COUNTY, COLORADO</i>	38
Hall, Benjamin	9:30 AM - 11:30 AM Ballroom	<i>TESTING THE PREDICTIVE ABILITY OF THE THEORY OF REASONED ACTION AND KNOWLEDGE ON INTENT TO COMMUNICATE ABOUT AND DONATE BLOOD</i>	42
Hammer, Laura	1:30 PM - 3:30 PM Ballroom	<i>SELECTING AN OPTIMAL LOCATION FOR AN EXPANDING FOOD FRANCHISE</i>	38
Han, Borah	1:30 PM Parlor C	<i>VARIATIONS ON AMERICA</i>	39
Hanna, Carly	9:30 AM - 11:30 AM Ballroom	<i>CEREBRAL PALSY SURVEILLANCE OF COMMUNICATION AND EATING</i>	38
Harris, Justin	2:15 PM Lake Superior Room	<i>GLOBALIZATION AND THE MEXICAN PRESS</i>	41
Harris, Matt	11:15 AM Lake Erie Room	<i>THROUGH THE MEDIAS LENS REPRESENTING THE 2003 IRAQ WAR</i>	19
Harris, Paul	1:30 PM - 3:30 PM Ballroom	<i>EXPRESSION, PURIFICATION, AND ACTIVITY STUDIES OF ACTIVATION-INDUCED DEAMINASE (AID) PROTEIN</i>	57
Hartman, Jeffrey	1:30 PM - 3:30 PM Gold Room	<i>CROSS-CULTURAL DECEPTION</i>	28
Hartman, Rachel	10:00 AM Tower Room	<i>COCKNEY RHYMING SLANG</i>	78

Hartman, Rachel	11:45 AM Tower Room	<i>MEANTIME</i>	78
Hatch, Alex	1:45 PM Lake Superior Room	<i>UTILIZING AUTODESK MAYA 2008 TO CREATE AN IMMERSIVE THREE-DIMENSIONAL EXPERIENCE FOR A THEATRICAL SETTING</i>	17
Healy, Bob	1:30 PM - 3:30 PM Ballroom	<i>ENTERTAINMENT AND CULURE IN MOROCCO AND CANADA</i>	32
Hedrick, Katherine	1:45 PM Parlor A	<i>ANALYZING AND TEACHING GLBT YOUNG ADULT LITERATURE FROM A QUEER PERSPECTIVE IN THE SECONDARY CLASSROOM</i>	38
Heidt, Anthony	9:30 AM - 11:30 AM Ballroom	<i>MULTILOCUS SEQUENCE TYPING OF DIVERGANT AND ANCETRAL ESCHERICHIA COLI</i>	38
Heinen, Virginia	2:30 PM Lake Huron Room	<i>MIGRATORY RESTLESSNESS IN WILD-LIVING PASSERINES</i>	39
Hemy, Sigal	1:30 PM Parlor C	<i>VARIATIONS ON AMERICA</i>	39
Henderson, Scott	9:30 AM - 11:30 AM Ballroom	<i>DIFFERENCES IN ADHESION BETWEEN ENTEROHEMORRHAGIC ESCHERICHIA COLI O157:H7 CLADES 8 AND 2</i>	39
Henige, Nikki	1:30 PM - 3:30 PM Gold Room	<i>VACCINES AND BIOTERRORISM</i>	23
Herwaldt, Marcy	9:30 AM - 11:30 AM Ballroom	<i>AN INVESTIGATION OF THE RELATIONSHIP OF SAMPLE SIZE AND MEAN LENGTH OF UTTERANCE FOR CHILDREN WITH DEVELOPMENTAL LANGUAGE IMPAIRMENT</i>	39
Hill, Emma	1:30 PM - 3:30 PM Gold Room	<i>EFFECTS OF MOBILIZATION EXERCISES ON HORSES RANGE OF MOTION OVER A 3-MONTH PERIOD</i>	77
Hill, Leah	9:30 AM - 11:30 AM Ballroom	<i>FUNCTIONAL MRI USING VASCULAR SPACE OCCUPANCY (VASO) AND VASCULAR SPACE OCCUPANCY WITH TISSUE SUPPRESSION (VAST)</i>	33
Hingst, Mary	10:45 AM Parlor B	<i>IDENTIFYING HISTORICAL STATES OF BALANCE (STEADY STATE/EQUILIBRIUM) IN LAKES USING SEDIMENT CHRONOLOGIES OF REDOX-SENSITIVE METALS</i>	39
Hirshey, Julie	1:30 PM - 3:30 PM Ballroom	<i>SELECTING AN OPTIMAL LOCATION FOR AN EXPANDING FOOD FRANCHISE</i>	38
Hochhalter, David	9:30 AM - 11:30 AM Ballroom	<i>OPTIMIZATION OF AN ELECTROSPUN NITROCELLULOSE CAPTURE PAD FOR BIOSENSING APPLICATIONS OF ESCHERICHIA COLI O157:H7</i>	40
Hodges, Korey	1:30 PM - 3:30 PM Ballroom	<i>TOTAL ANTIOXIDANT CONTENT IN WHOLE CHESTNUT MEAT AS AFFECTED BY PACKAGING OVER TIME</i>	40
Hodges, Meghan	1:30 PM - 3:30 PM Ballroom	<i>A CRITICAL VIEW OF THE CENTERS FOR DISEASE CONTROL AND PREVENTION'S IMMUNIZATION SCHEDULE</i>	40
Holberg, Jessica	9:30 AM - 11:30 AM Gold Room	<i>PHANTOM ENERGY WASTE IN UNIVERSITY HOUSING</i>	40

Holdsworth, William	2:15 PM Lake Huron Room	<i>TOWARD MAP-BASED CLONING OF THE UNIFORM GRAY-GREEN GENE IN TOMATO</i>	40
Holsinger, Kelsey	9:30 AM - 11:30 AM Gold Room	<i>THE ROLE OF THE INPUT IN FIRST LANGUAGE ACQUISITION: THE CASE OF MEXICAN AND CHILEAN SPANISH</i>	59
Holycross, Megan	2:00 PM Parlor C	<i>IN SEARCH OF THE ARTHROPHYCUS MAKER</i>	41
Homant, Heather	9:30 AM - 11:30 AM Gold Room	<i>USING MULTICULTURAL LITERATURE IN THE SECONDARY SCHOOL CLASSROOM</i>	41
Hopkins, Charlene	9:30 AM Lake Huron Room	<i>FEMALE ATTRIBUTES CORRELATED WITH THE INCIDENCE OF MULTIPLE PATERNITY IN THE SNAPPING TURTLE (CHELYDRA SERPENTINA)</i>	41
House, Kelly	2:15 PM Lake Superior Room	<i>GLOBALIZATION AND THE MEXICAN PRESS</i>	41
Howard, Michael	1:30 PM - 3:30 PM Ballroom	<i>DNA BINDING AND DISSOCIATION CONSTANT OF ALKYLATION RESPONSE PROTEIN AIDB IN ESCHERICHIA COLI</i>	41
Huang, Michael	9:30 AM - 11:30 AM Ballroom	<i>DEVELOPMENT AND EFFICACY OF ANTI-SALMONELLA MAGNETIC BEADS</i>	41
Huber, Elizabeth	11:45 AM Parlor B	<i>DEVELOPMENT OF ANTIMICROBIAL FILMS BASED ON PLA WITH IMPLICATIONS FOR FOOD PACKAGING</i>	42
Hummel, Kristin	1:30 PM - 3:30 PM Gold Room	<i>ROLE OF HEAT SHOCK PROTEIN 70 (HSP70) IN O3-INDUCED LUNG INFLAMMATION</i>	42
Hunt, Jeromy	1:00 PM Parlor C	<i>PERFORMANCE GENEALOGY: ARTS THROUGH THE AGES</i>	42
Hurley, Allison	9:30 AM - 11:30 AM Ballroom	<i>TESTING THE PREDICTIVE ABILITY OF THE THEORY OF REASONED ACTION AND KNOWLEDGE ON INTENT TO COMMUNICATE ABOUT AND DONATE BLOOD</i>	42
Hurst, Ryan	9:30 AM Tower Room	<i>THE MATTRESS SOURCE</i>	82
Hutta, Jessica	1:30 PM - 3:30 PM Gold Room	<i>HEAD START EVALUATION</i>	31
Iaquinto, Nicole	1:30 PM Green Room	<i>AFRICA'S LATE DECOLONIZING TRANSITIONS: SOUTH AFRICA'S ANC AND NAMIBIA'S SWAPO</i>	42
Inwald, Valerie	10:45 AM Lake Superior Room	<i>ANXIETY AND ACHIEVEMENT: INVESTIGATING THE IMPACT OF TEST ANXIETY ON COLLEGE-LEVEL STUDENTS</i>	42
Ivens, Katherine	1:30 PM - 3:30 PM Ballroom	<i>CHARACTERIZATION OF SWARMING MOTILITY IN SOIL BACTERIA</i>	43
Jackson, Tom	9:30 AM - 11:30 AM Ballroom	<i>TESTING THE PREDICTIVE ABILITY OF THE THEORY OF REASONED ACTION AND KNOWLEDGE ON INTENT TO COMMUNICATE ABOUT AND DONATE BLOOD</i>	42

Jacob, Erica	1:30 PM - 3:30 PM Gold Room	<i>DEVELOPMENT OF THEORY OF MIND AND DIVISION OF COGNITIVE LABOR</i>	46
Jain, Reena	1:30 PM - 3:30 PM Ballroom	<i>AN EXPLORATORY STUDY OF THE RELATIONSHIP BETWEEN STUDENTS FACEBOOK USE AND OFFLINE POLITICAL ACTIVITY</i>	43
Jeffers, Tess	1:30 PM - 3:30 PM Ballroom	<i>COMPUTATIONAL CIS-REGULATORY GRAMMAR AND EXTENSION OF MODEL TO ENDOGENOUS ELEMENTS</i>	43
Jeffery, Kathleen	9:30 AM - 11:30 AM Gold Room	<i>TIMESCALE ESTIMATES OF AQUEOUS ALTERATION ON CARBONACEOUS CHONDRITES BY THE SHRINKING CORE MODEL</i>	43
Jelinek, Kayla	10:00 AM Green Room	<i>DIRECT-TO-CONSUMER ADVERTISING OF GARDASIL</i>	43
Jelinek, Sara	9:30 AM - 11:30 AM Gold Room	<i>THE EFFECTS OF MESSAGE FRAMING ON THE CESSATION OF A POTENTIALLY DAMAGING HEALTH BEHAVIOR: ALCOHOL CONSUMPTION IN COLLEGE STUDENTS</i>	44
Jenkins, Cassandra	1:30 PM - 3:30 PM Ballroom	<i>REDEFINING BIOAVAILABILITY</i>	45
Jensen, Jessica	1:30 PM - 3:30 PM Ballroom	<i>LIVING MANY LIVES: REPRESENTING THE EXPERIENCES OF BLACK WOMEN LIVING WITH SEVERE AND PERSISTENT MENTAL ILLNESS</i>	44
Jensen, Laura	10:15 AM Parlor A	<i>HOW DO ENGLISH SPEAKERS LEARNING FRENCH MAKE TU-VOUS DECISIONS?</i>	44
Jessmore, Andrew	1:30 PM - 3:30 PM Ballroom	<i>THE EFFECT OF MEDICAL TRUST IN THE KINKEEPERSM PROGRAM: COMMUNITY HEALTH WORKER PERSPECTIVE</i>	44
Johnson, Benjamin	1:30 PM - 3:30 PM Gold Room	<i>A STUDY OF ELECTRICAL RESISTIVITY METHODS IN MONITORING MOISTURE FLUXES IN THE VADOSE SOIL ZONE</i>	45
Johnson, Emily	9:30 AM - 11:30 AM Ballroom	<i>CONSEQUENCES OF UNIVERSAL VACCINATION FOR VARICELLA</i>	45
Johnson, Patrice	9:45 AM Lake Erie Room	<i>BREAKING THE CHAINS OF GENERATIONAL CURSES: A HISTORICAL ANALYSIS OF THE BLACK FAMILY</i>	45
Johnson, Teresa	1:30 PM - 3:30 PM Ballroom	<i>REDEFINING BIOAVAILABILITY</i>	45
Johnston, Lindsey	9:30 AM - 11:30 AM Gold Room	<i>SYNTHESIS AND PHYSICAL PROPERTIES OF DIVALENT METAL COORDINATION POLYMERS WITH FLEXIBLE LIGANDS</i>	45
Jones, Sara	1:30 PM - 3:30 PM Ballroom	<i>EFFECT OF SUB-LETHAL HEATING ON ISALMONELLAI LETHALITY DURING SLOW-COOKING OF TURKEY AND BEEF PRODUCTS</i>	46
Jordan, Sarah	1:30 PM - 3:30 PM Gold Room	<i>AN ANALYSIS OF IF AND HOW DEMOGRAPHICS ARE CORRELATED TO CONFIDENCE AND CORRECTNESS</i>	46
Kalso, Reed	11:00 AM Lake Superior Room	<i>ENTERTAINMENT AND CULTURE IN JAPAN AND ZAMBIA</i>	26
Kanya, Meghan	1:30 PM - 3:30 PM Gold Room	<i>DEVELOPMENT OF THEORY OF MIND AND DIVISION OF COGNITIVE LABOR</i>	46

Kapadia, Binafza	1:30 PM - 3:30 PM Ballroom	<i>RELATING BUFFER CHEMISTRY TO THE ANTIBACTERIAL PERFORMANCE OF ORGANIC ACIDS IN BRAIN-HEART INFUSION GROWTH MEDIUM</i>	46
Karram, Matthew	1:30 PM - 3:30 PM Gold Room	<i>IMPLICIT RESTRICTIONS IN ADULT LANGUAGE</i>	26
Katneni, Srikar	9:30 AM - 11:30 AM Gold Room	<i>INFLUENCE OF GENDER ON CORTICAL ACTIVATION</i>	20
Katsande, Gloria	1:30 PM - 3:30 PM Ballroom	<i>UNDERGRADUATE NURSING RESEARCH</i>	47
Kauth, Mark	9:30 AM - 11:30 AM Ballroom	<i>DIFFERENCES IN EVOLVABILITY IN RIFAMPICIN-RESISTANT ESCHERICHIA COLI</i>	47
Keller, Andrew	1:30 PM - 3:30 PM Gold Room	<i>SUPERCONDUCTING CRITICAL TEMPERATURE SHIFTS IN FERROMAGNET-SUPERCONDUCTOR-FERROMAGNET JUNCTIONS</i>	47
Kelly, Mark	1:00 PM Lake Erie Room	<i>"AND THE PARTY OF FREEDOM IS WAKING...": THE FORMATION OF THE WISCONSIN REPUBLICAN PARTY IN 1854</i>	47
Kelm, Steve	1:30 PM - 3:30 PM Ballroom	<i>ENTERTAINMENT AND CULURE IN MOROCCO AND CANADA</i>	32
Kevin, Raehtz	9:30 AM - 11:30 AM Ballroom	<i>THE IMPACT OF PHOTO-OXIDATION ON CHLOROPLAST DNA: MUTATIONAL LESIONS AND RECOMBINATIONAL REPAIR</i>	65
Kikes, Adrian	11:15 AM Lake Superior Room	<i>DIVERSITY OF ETHNICITY IN ENTERTAINMENT AND CULTURE BETWEEN THE UNITED STATES AND JAPAN</i>	27
Killinger, Alex	1:30 PM - 3:30 PM Ballroom	<i>ISOLATION OF NOVEL PLANT POLYMER DEGRADERS FOR USE IN BIOFUEL PRODUCTION</i>	47
King, Marilyn	2:15 PM Lake Superior Room	<i>GLOBALIZATION AND THE MEXICAN PRESS</i>	41
Klee, Lauren	9:30 AM - 11:30 AM Ballroom	<i>CLASSIFYING TYPICALLY DEVELOPING TODDLERS AND PRESCHOOLERS USING THE COMMUNICATION FUNCTION CLASSIFICATION SYSTEM (CFCS)</i>	84
Klimyte, Edita	11:45 AM Lake Huron Room	<i>ALTERNATIVE HYPOTHESIS CONCERNING HUMAN DISEASE AND MODELS OF COMPENSATORY EVOLUTION IN TRNAS VIA EXPERIMENTS IN SACCHAROMYCES CEREVISIAE</i>	48
Knollenberg, Whitney	1:30 PM - 3:30 PM Gold Room	<i>WALK, RIDE AND LEARN: STUDENTS DISCOVERY OF NATURE ON THEIR ROUTE TO SCHOOL</i>	48
Koenig, Deanna	1:30 PM - 3:30 PM Ballroom	<i>CREATING EFFECTIVE POSTER PRESENTATIONS: EMPLOYING CRAP ACROSS THE DISCIPLINES</i>	48
Kolenda, Kate	11:00 AM Lake Superior Room	<i>ENTERTAINMENT AND CULTURE IN JAPAN AND ZAMBIA</i>	26
Konarz, Brittany	1:30 PM - 3:30 PM Ballroom	<i>LIVING MANY LIVES: REPRESENTING THE EXPERIENCES OF BLACK WOMEN LIVING WITH SEVERE AND PERSISTENT MENTAL ILLNESS</i>	44
Kornack, Jordan	9:30 AM - 11:30 AM Gold Room	<i>ENVIRONMENTALLY FRIENDLY PRODUCTS: IMPLEMENTING SUSTAINABLE PURCHASING IN MSU UNIVERSITY STORES</i>	37

Kosnik, Angeline	1:30 PM - 3:30 PM Gold Room	<i>EFFECTS OF SALMON AND LOGGING ON INVERTEBRATE POPULATIONS OF THE HYPORHEIC ZONE IN SOUTHEAST ALASKA</i>	48
Kovacek, Laura	9:30 AM - 11:30 AM Ballroom	<i>THE CHICAGO WORKSHOP MODEL: NORMALIZING OR FRAGMENTING SCIENTIFIC COLLABORATION?</i>	48
Kramer, Emily	10:00 AM Green Room	<i>DIRECT-TO-CONSUMER ADVERTISING OF GARDASIL</i>	43
Kraus, Anthony	1:30 PM - 3:30 PM Gold Room	<i>APPROXIMATING THE SCHRODINGER EQUATION USING COMPUTATIONAL CHEMISTRY TECHNIQUES</i>	49
Krcmarik, Kelly	1:30 PM - 3:30 PM Ballroom	<i>NEURONAL Ca CHANNEL SUBTYPES DIFFERENTIALLY MODIFY SENSITIVITY TO METHYLMERCURY-INDUCED CELL DEATH</i>	49
Kring, Daniel	1:00 PM Parlor C	<i>PERFORMANCE GENEALOGY: ARTS THROUGH THE AGES</i>	42
Kristl, Sean	9:30 AM - 11:30 AM Ballroom	<i>CONSUMER RESPONSE TO MOBILE ADVERTISING TARGETED BY LOCATION AND PROXIMITY</i>	61
Kristl, Sean	1:30 PM - 3:30 PM Ballroom	<i>IMPLEMENTING LANDMARKS ON IN-CAR GPS NAVIGATION SYSTEMS</i>	49
Krohn, Jennifer	1:30 PM - 3:30 PM Gold Room	<i>THE EFFECT OF MESSAGE FRAMING ON SMOKING CESSATION</i>	49
Kruth, Cash	2:15 PM Lake Superior Room	<i>GLOBALIZATION AND THE MEXICAN PRESS</i>	41
Kudsin, Jennifer	9:30 AM Lake Superior Room	<i>LONG-TERM IMPACT OF AN OVERSEAS STUDY PROGRAM</i>	49
Kulbaba, Grace	9:30 AM - 11:30 AM Gold Room	<i>INDIVIDUALISM, COLLECTIVISM, AND RACE RELATED STRESS</i>	49
Kumar, Sri	1:30 PM - 3:30 PM Ballroom	<i>THE EFFECT OF FIRE ON NEW CONCRETES</i>	50
Kurzeja, Phillip	1:15 PM Lake Huron Room	<i>ARE ROOT PROBLEMS INVOLVED IN LEAF SCORCH?</i>	50
LaFeldt, Chad	1:30 PM - 3:30 PM Ballroom	<i>PRODUCTION OF HIGH VALUE OILS FROM ALGAE</i>	50
LaGosh, Jennifer	1:30 PM - 3:30 PM Ballroom	<i>EXPORTING DEATH: PROMOTING AMERICAN TOBACCO PRODUCTS IN CHINA</i>	50
Lala, Michael	9:30 AM Parlor A	<i>CREATIVE WRITING: WRITING CENTERS- WORKSHOPPING IN NEW WAYS</i>	14
Lane, Jasmine	9:30 AM - 11:30 AM Gold Room	<i>DEVELOPMENT OF INTERLIMB COORDINATION IN FOALS</i>	50
LaPlante, Carolyn	9:30 AM - 11:30 AM Ballroom	<i>LANGUAGE VARIATION AND ITS EFFECT ON THE BELIEVABILITY OF SOCIAL NORMS MESSAGES</i>	51
Lapp, Jacqueline	9:45 AM Lake Huron Room	<i>THE ROLE OF THE JUMONJIC-DOMAIN CONTAINING PROTEINS IN ARABIDOPSIS THALIANA</i>	51

LaRouere, Jacqueline	11:00 AM Green Room	<i>PSYCHOLOGICAL CARE FOR RAPE VICTIMS IN AFRICAN CONFLICT SITUATIONS</i>	51
Larson, Britt	9:30 AM - 11:30 AM Gold Room	<i>THE RELATIONSHIP BETWEEN REIN TENSION AND NATURAL OSCILLATIONS OF THE HEAD AND NECK IN THE TROTTING HORSE</i>	51
Lauckner, John	10:00 AM Lake Superior Room	<i>THE WRITING CENTER AND DIGITAL LITERACIES</i>	51
Laurain, Douglas	9:30 AM - 11:30 AM Ballroom	<i>INDUCTION OF APOPTOTIC ACTIVITY IN HACAT CELLS BY TYPE I INTERFERONS (ALPHA AND BETA)</i>	52
Lawrence, Bradley	2:15 PM Tower Room	<i>PUBERTAL DEVELOPMENT OF THE SEXUAL DOPAMINERGIC SYSTEM IN MALE HAMSTERS</i>	52
Lazar, Marie	1:30 PM Lake Superior Room	<i>JURRASIC COMMANDER POSTMORTEM</i>	87
Lee, Ha-Na	1:30 PM - 3:30 PM Gold Room	<i>EVALUATION OF INTERIOR DESIGN IN MICHIGAN STATE UNIVERSITY'S CLASSROOMS FOR IMPROVED QUALITY OF INSTRUCTION</i>	52
Lee, Jun-seok	1:30 PM - 3:30 PM Ballroom	<i>REGULATION OF C-SIGNAL-DEPENDENT PROMOTER 4403 IN MYXOCOCCUS XANTHUS</i>	52
Lee, Lawrence	10:15 AM Lake Huron Room	<i>HAPLOTYPE ANALYSIS OF THE OTOF GENE REGION AS A POSSIBLE CAUSE OF DEAFNESS IN AN INDIVIDUAL</i>	53
Leefers, John	1:30 PM - 3:30 PM Ballroom	<i>ASSESSMENT OF DEPRESSION IN PERSONS EXPERIENCING THE EARLY STAGES OF ALZHIEMER DISEASE</i>	53
Legowo, Andre	1:30 PM - 3:30 PM Gold Room	<i>A RELATIONSHIP BETWEEN AN ENZYMATIC MODIFIED STARCH AND WATER</i>	53
Leinbach, Braden	1:30 PM - 3:30 PM Gold Room	<i>STATISTICAL PROPERTIES IN DETERMINING THE APPLICATION OF 'TALL' AND 'SHORT'</i>	29
Leinbach, Braden	9:30 AM - 11:30 AM Gold Room	<i>CHILD AND ADULT USE OF PROSODY IN SYNTACTIC DISAMBIGUATION</i>	80
Leinenger, Mallorie	1:30 PM Tower Room	<i>COMPREHENSION AND RETENTION OF DIFFERENT TEXT TYPES ACROSS LANGUAGES</i>	53
Leppek, Michelle	9:30 AM - 11:30 AM Ballroom	<i>GEOGRAPHIC RACIAL EQUALITY BETWEEN AMERICAN INDIANS AND WHITES IN GRADY COUNTY, OKLAHOMA</i>	53
Lewis, Jenni	11:15 AM Lake Superior Room	<i>DIVERSITY OF ETHNICITY IN ENTERTAINMENT AND CULTURE BETWEEN THE UNITED STATES AND JAPAN</i>	27
Lewis, Jenni	2:30 PM Lake Superior Room	<i>CREATING MEDIA MESSAGES TO INCREASE ASIAN IMMIGRANT ACCESS TO HEALTHCARE IN METRO DETROIT</i>	53
Linderman, Eric	1:30 – 3:30 PM Gold Room	<i>THE BROWN HYENA</i>	29
Lipowski, Jessica	11:30 AM Lake Superior Room	<i>ARABS, JEWS AND THE NEWS DOCUMENTARY</i>	54
Lippett, Michael	9:30 AM Tower Room	<i>THE MATTRESS SOURCE</i>	82

Lippner, Dennean	9:30 AM - 11:30 AM Ballroom	<i>ROLE OF CASPASE 2 IN TYPE I DIABETIC BONE LOSS</i>	54
Lira, Nicolas	2:30 PM Parlor C	<i>THE INFLUENCE OF SHAKUHACHI MUSIC ON MAI BY RYO NODA</i>	54
Liu, Xiaozhou	10:45 AM Lake Huron Room	<i>CIS REGULATORY GRAMMAR AND SYSTEMS BIOLOGY</i>	54
Lockhart, Maria	1:45 PM Green Room	<i>IN SEARCH OF GEOGRAPHIC RACIAL EQUALITY IN METRO-DETROIT</i>	54
Lonc, Kaitlin	9:30 AM Parlor B	<i>EFFECTS OF URBANIZATION AND HUMAN ACTIVITY ON SCIURUS CAROLINENSIS BEHAVIOR: CASE STUDY AT MICHIGAN STATE UNIVERSITY</i>	55
Long, Kristin	1:30 PM - 3:30 PM Ballroom	<i>HOW WELL DO COLLEGE CAMPUSES SUPPORT US TO BE PHYSICALLY ACTIVE?</i>	55
Longueuil, Ryan	1:30 PM - 3:30 PM Ballroom	<i>DISCRIMINATION OF FRESHWATER MICROBIOFILM ARCHITECTURES USING THE CMEIAS-2 MORPHOTYPE CLASSIFIER</i>	55
Lorts, Claire	9:30 AM - 11:30 AM Gold Room	<i>EVOLUTION OF FRUIT TYPES AND SEED DISPERSAL: A PHYLOGENETIC AND ECOLOGICAL SNAPSHOT</i>	55
Louis, Carrie	1:15 PM Tower Room	<i>EQUAL PAY FOR EQUAL PLAY: DEVELOPMENTAL CHANGE IN YOUNG CHILDRENS FAIRNESS CONCERNS AND COOPERATION</i>	29
Lucke, Morgan	9:30 AM - 11:30 AM Gold Room	<i>USING DENDROCHRONOLOGICAL TECHNIQUES TO INVESTIGATE THE EFFECTS OF GLOBAL WARMING ON LARIX LARICINA</i>	55
Ludtke, Carly	11:15 AM Tower Room	<i>HIGH STEP: A STORY OF THE SPARTAN MARCHING BAND</i>	83
Luethy, Paul	9:30 AM - 11:30 AM Ballroom	<i>PROBING ENZYME-SUBSTRATE INTERACTION OF AN INTRAMEMBRANE-CLEAVING PROTEASE</i>	56
Lysak, Nicole	9:30 AM - 11:30 AM Ballroom	<i>IMPROVING THE FACEBOOK MOBILE INTERFACE TO INCREASE USABILITY</i>	28
Lysak, Nicole	1:30 PM - 3:30 PM Ballroom	<i>COMPARING THE USABILITY OF ANALOG VS DIGITAL SPEEDOMETERS</i>	56
Lyskawa, Julia	9:30 AM Green Room	<i>FROM GENERATION GI TO GENERATION Y: THE NEEDS OF RELATIVE CAREGIVERS BY AGE</i>	56
Machiniak, Megan	1:30 PM - 3:30 PM Ballroom	<i>IDENTIFICATION OF MIXED-SPECIES BLOODMEALS IN MOSQUITOES VIA BACTERIAL CLONING</i>	56
MacLellan, James	1:30 PM - 3:30 PM Ballroom	<i>THE EFFECTS OF DILUTE ACID TREATMENT ON COMPONENTS OF MANURE FIBER</i>	57
Maki, Sarah	1:00 PM Tower Room	<i>FUNCTIONAL ANATOMY OF READING STORIES VERSUS SOLVING MATH PROBLEMS USING FMRI</i>	26
Makohon-Moore, Alvin	1:30 PM - 3:30 PM Ballroom	<i>EXPRESSION, PURIFICATION, AND ACTIVITY STUDIES OF ACTIVATION-INDUCED DEAMINASE (AID) PROTEIN</i>	57
Mang, Ellen	10:15 AM Parlor C	<i>UNDERSTANDING KEY COMPONENTS OF NUTRITION ENVIRONMENTS, POLICIES AND PROGRAMS IN SCHOOLS AND THEIR IMPACT ON STUDENTS DIETS</i>	57

Mapes, Egypt	9:30 AM - 11:30 AM Gold Room	<i>LOW-MAINTENANCE ROADSIDE ALTERNATIVES FOR THE PROMOTION OF ECOLOGICAL RESPONSIBILITY</i>	57
Marchin, Angela	1:30 PM - 3:30 PM Gold Room	<i>DOPAMINERGIC INPUTS TO THE MEDIAL PREOPTIC AREA OF ADULT, MALE HAMSTERS</i>	57
Martin, Alexander	1:30 PM - 3:30 PM Ballroom	<i>GROWTH, DIFFERENTIATION, AND PERSISTENCE OF BACTERIA PHOTORHABDUS LUMINESCENS IN THE NEMATODE HETERBDITIS BACTERIOPHORA</i>	57
Marzotto, Elizabeth	1:15 PM Lake Superior Room	<i>STEEL: HOT METAL, COLD REALITY</i>	58
Mason, Mathew	3:00 PM Lake Superior Room	<i>SPHERE - AN EXPERIMENT IN SIMPLIFYING GAMEPLAY,SCOPE AND CONTROLS IN VIDEO GAMES TO FACILITATE GREATER PLAYER IMMERSION</i>	69
Massie, Jon	9:30 AM - 11:30 AM Ballroom	<i>SPIDER SILK - FIBER OF THE FUTURE</i>	58
Matheny, Justyne	9:30 AM - 11:30 AM Ballroom	<i>EFFECT OF MUTATIONS AT PUTATIVE UBIQUITINYLIATION SITES ON TRANSCRIPTIONAL ACTIVATION BY THE VP16 PROTEIN OF HERPES SIMPLEX VIRUS</i>	58
Mattran, Kelly	9:45 AM Parlor C	<i>PHYSICAL ACTIVITY DURING PREGNANCY AND OFFSPRING SIZE (PAPOS): BODY COMPOSITION AT 18-24 MONTHS</i>	58
Mayer, Rebecca	1:30 PM - 3:30 PM Gold Room	<i>SYMPTOMS OF PTSD AND WORKING MEMORY CAPACITY</i>	58
Mayle, Ryan	1:30 PM - 3:30 PM Ballroom	<i>CHLOROPLAST DNA MUTATIONS AS A GENETIC INDICATOR OF OXIDATIVE DAMAGE IN CHLAMYDOMONAS REINHARDTII</i>	59
Maynard, Jason	1:45 PM Lake Superior Room	<i>UTILIZING AUTODESK MAYA 2008 TO CREATE AN IMMERSIVE THREE-DIMENSIONAL EXPERIENCE FOR A THEATRICAL SETTING</i>	17
Mazzio, Amanda	9:30 AM - 11:30 AM Gold Room	<i>THE ROLE OF THE INPUT IN FIRST LANGUAGE ACQUISITION: THE CASE OF MEXICAN AND CHILEAN SPANISH</i>	59
McCarthy, Mary	9:30 AM - 11:30 AM Ballroom	<i>EXPRESSION OF SMALL BREAST EPITHELIAL MUCIN (SBEM), A POSSIBLE BREAST CANCER BIOMARKER</i>	59
McCarthy, Shannon	10:00 AM Lake Huron Room	<i>FUNCTIONAL MRI USING VASCULAR SPACE OCCUPANCY (VASO) AND VASCULAR SPACE OCCUPANCY WITH TISSUE SUPPRESSION (VAST)</i>	69
McClowry, Robert	9:30 AM - 11:30 AM Ballroom	<i>POPULATION STRUCTURE OF CHERRY FRUIT FLY (RHAGOLETIS CINGULATA) IN MANAGED, UNMANAGED, AND NATURAL HABITATS</i>	59
McCormick, Amanda	9:30 AM - 11:30 AM Ballroom	<i>GEOGRAPHIC RACIAL EQUALITY IN THE METROPOLITAN CHICAGO AREA BETWEEN ASIANS AND WHITES</i>	59
McCormick, Brittany	9:30 AM - 11:30 AM Ballroom	<i>CONSUMER RESPONSE TO MOBILE ADVERTISING TARGETED BY LOCATION AND PROXIMITY</i>	61
McCormick, Brittany	1:30 PM - 3:30 PM Ballroom	<i>COMFORT LEVEL AND THEIR EFFECTS ON THE SAFE USE OF AUTOMOBILES</i>	60

McCoy, Martha	2:00 PM Lake Huron Room	<i>FUNCTIONAL TRAITS UNDERLYING MATING SYSTEM EVOLUTION IN THE WILD RELATIVES OF RICE</i>	60
McCoy, Victoria	9:30 AM - 11:30 AM Gold Room	<i>BIOGEOGRAPHIC ASSOCIATIONS OF SILURIAN BRYOZOAN GENERA IN NORTH AMERICA, BALTICA AND SIBERIA</i>	60
McCurry, Andrea	9:30 AM - 11:30 AM Ballroom	<i>THE IMPACT OF SINES INSERTED IN 3 PRIME UTRS ON MRNA STABILITY</i>	60
McDonald, Kyle	1:30 PM - 3:30 PM Ballroom	<i>THE EFFECT OF MEDICAL TRUST IN THE KINKEEPERSM PROGRAM: COMMUNITY HEALTH WORKER PERSPECTIVE</i>	44
McGorey, Mary	3:00 PM Parlor C	<i>CHOREOGRAPHY AS RESEARCH-RESEARCH AS CHOREOGRAPHY</i>	73
McLean, Jessica	2:00 PM Parlor A	<i>THE SELECTION OR EXCLUSION OF THE GOLDEN COMPASS BOOKS IN SECONDARY ENGLISH CLASSES</i>	60
McMahon, Chris	9:30 AM - 11:30 AM Ballroom	<i>CONSUMER RESPONSE TO MOBILE ADVERTISING TARGETED BY LOCATION AND PROXIMITY</i>	61
McMahon, Chris	1:30 PM - 3:30 PM Ballroom	<i>USABILITY AND USE OF RAILROAD SYSTEMS</i>	61
Meeuwssen, Ellen	10:30 AM Lake Superior Room	<i>EVOLUTION FOR EVERYONE</i>	61
Messenger, Nicole	9:30 AM - 11:30 AM Ballroom	<i>SCANNING ELECTRON MICROSCOPE PLANT STRUCTURE AND FUNCTION IMAGES</i>	61
Mianeck, Julie	1:15 PM Lake Superior Room	<i>STEEL: HOT METAL, COLD REALITY</i>	58
Michorczyk, Krysta	3:00 PM Parlor C	<i>CHOREOGRAPHY AS RESEARCH-RESEARCH AS CHOREOGRAPHY</i>	73
Miller, Andrew	1:30 PM - 3:30 PM Ballroom	<i>PRODUCTION OF HIGH VALUE OILS FROM ALGAE</i>	50
Miller, Daniel	10:00 AM Parlor C	<i>COMPARISON OF ECONOMY IN OVER-GROUND VERSUS TREADMILL WALKING IN CHILDREN AND ADOLESCENTS</i>	61
Miller, Derek	9:30 AM - 11:30 AM Ballroom	<i>ANATOMY OF A GUITAR STRING</i>	62
Miller, Hanna	1:30 PM - 3:30 PM Ballroom	<i>NOVEL ELECTRICALLY ACTIVE POLYANILINE COATED MAGNETIC (EAPM) NANOPARTICLES FOR MAGNETIC CONCENTRATION OF BACTERIA</i>	62
Miller, Olivia	1:30 PM - 3:30 PM Gold Room	<i>HEAD START EVALUATION</i>	31
Million, Amber	9:30 AM - 11:30 AM Ballroom	<i>PREVALENCE AND TRANSMISSION OF GROUP B STREPTOCOCCUS GBS IN FAMILIES LIVING ON FARMS AND THEIR FARM ANIMALS</i>	62
Milne, Erin	9:30 AM - 11:30 AM Ballroom	<i>SEEING BETTER: OPTIMIZING SURGICALLY INDUCED ASTIGMATISM CORRECTION FACTORS FOR CATARACT SURGERY</i>	88

Misic, Abigail	9:30 AM - 11:30 AM Gold Room	<i>ESOTERICISM, RELIGION, AND NATURE</i>	62
Mitchell, Autumn	9:30 AM - 11:30 AM Gold Room	<i>CHILDREN LEARNING OJIBWE IN A SCHOOL SETTING</i>	62
Momin, Munira	1:30 PM - 3:30 PM Ballroom	<i>PROTEIN SECRETION</i>	72
Moore, Jonathan	1:30 PM - 3:30 PM Ballroom	<i>CABBAGE QUEST</i>	62
Morey, Shannon	1:30 PM - 3:30 PM Gold Room	<i>CONTINUOUS WAVE AND PULSED EPR STUDIES OF TAUD</i>	63
Morey, Shannon	9:45 AM Parlor B	<i>BOTANICAL INSECTICIDE PERSISTENCE STUDIES</i>	63
Morgan, Clifford	1:30 PM - 3:30 PM Ballroom	<i>VIRAL CANCER PROTEIN MIDDLE T (MT) EFFECTS ON AP-1 AND ETS TRANSCRIPTION FACTORS IN TUMOR CELLS</i>	63
Morr, Rachel	1:30 PM - 3:30 PM Ballroom	<i>CHARACTERIZATION OF THE INTERACTIONS BETWEEN THE KLEBSIELLA AEROGENES UREASE ACCESSORY PROTEINS UREE AND UREG</i>	63
Morton, Seth	11:00 AM Parlor A	<i>UNCERTAINTY PRINCIPLES: THE CHANGING DYNAMICS OF NARRATIVE AND THEORY IN THE 21ST CENTURY</i>	63
Mulville, Anson	11:00 AM Tower Room	<i>MSU&U</i>	64
Murphy, Brittany	12:00 Noon Parlor B	<i>HABITAT QUALITY AFFECTS RATES OF GENE FLOW IN SOUTH-CENTRAL MICHIGAN WHITE-TAILED DEER</i>	64
Murphy, Elizabeth	9:30 AM - 11:30 AM Gold Room	<i>COMPARING ADULT SPEECH AND CHILD SPEECH IN TWO DIALECTS OF SPANISH</i>	64
Murray, Matthew	9:30 AM Lake Erie Room	<i>REGIME CHANGE IN TRIPOLI</i>	64
Murray, Matthew	9:30 AM - 11:30 AM Ballroom	<i>DOING BUSINESS IN THE UNITED STATES: STARTING A BUSINESS</i>	70
Musielak, Kayla	1:30 PM - 3:30 PM Gold Room	<i>A STUDY OF LETTER NAME KNOWLEDGE</i>	64
Mussell, Patrick	1:30 PM Lake Superior Room	<i>JURRASIC COMMANDER POSTMORTEM</i>	87
Nagori, Ashita	9:30 AM - 11:30 AM Ballroom	<i>THE IMPACT OF PHOTO-OXIDATION ON CHLOROPLAST DNA: MUTATIONAL LESIONS AND RECOMBINATIONAL REPAIR</i>	65
Naraharisetti, Ramya	2:15 PM Green Room	<i>EMPOWERMENT, LEADERSHIP, AND INTERGENERATIONAL DYNAMICS AMONG YOUNG WOMEN IN RURAL SOUTH AFRICA (SA)</i>	65
Nash, Daniel	9:30 AM - 11:30 AM Ballroom	<i>QUANTITATIVE ANALYSIS OF TUMORS</i>	65

Neilson, Jessie	1:00 PM Parlor C	<i>PERFORMANCE GENEALOGY: ARTS THROUGH THE AGES</i>	42
Nettleman, Joseph	9:30 AM - 11:30 AM Gold Room	<i>EFFECT OF METAL AND ALKYL SUBSTITUTION ON THE STRUCTURE AND MAGNETIC PROPERTIES OF DUAL LIGAND COORDINATION POLYMERS</i>	65
Nguyen, Kim	1:30 PM - 3:30 PM Ballroom	<i>THE EFFECT OF MEDICAL TRUST IN THE KINKEEPERSM PROGRAM: COMMUNITY HEALTH WORKER PERSPECTIVE</i>	44
Nguyen, Tuan	10:45 AM Parlor C	<i>ALOE VERA-CHITOSAN BLEND AS A NEW EDIBLE COATING FOR IMPROVING THE SHELF-LIFE OF STRAWBERRY (FRAGARIA X ANANASSA) DURING REFRIGERATED STORAGE</i>	65
Nguyen, Loan	9:30 AM - 11:30 AM Ballroom	<i>POLYMATHY OF NOBEL PEACE PRIZE LAUREATES</i>	17
O'Brien, Megan	10:15 AM Green Room	<i>SQUATTER SETTLEMENTS IN LATIN AMERICA: SANTA ELENA, VENEZUELA AND LIMA, PERU</i>	66
Ochalek, Courtney	1:15 PM Tower Room	<i>EQUAL PAY FOR EQUAL PLAY: DEVELOPMENTAL CHANGE IN YOUNG CHILDRENS FAIRNESS CONCERNS AND COOPERATION</i>	29
O'Connor, Katherine	1:30 PM Lake Huron Room	<i>ANALYZING DIFFERENCES IN SADDLE PRESSURE IN EQUINES</i>	66
Oehring, Lydia	9:30 AM - 11:30 AM Gold Room	<i>THE USE OF COLOR AS AN IMPLICIT RESTRICTION IN CHILD'S LANGUAGE</i>	16
Ok, Tina	1:30 PM - 3:30 PM Gold Room	<i>STUDY OF POLYMATHS: NOBEL PRIZE WINNERS IN ECONOMICS</i>	72
Okeafor, Nkechi	1:30 PM - 3:30 PM Ballroom	<i>ACTIVIST SOLIDARITY BETWEEN MICHIGAN AND CENTRAL AMERICA</i>	66
Orlando, Jennifer	11:30 AM Lake Superior Room	<i>ARABS, JEWS AND THE NEWS DOCUMENTARY</i>	54
Ortlieb, Matt	9:45 AM Lake Superior Room	<i>MY LONDON</i>	66
Owens, Kellie	10:30 AM Green Room	<i>LIFE (UN)WORTH LIVING: ETHICAL IMPLICATIONS OF PRENATAL SCREENING</i>	66
Pahl, Colin	1:30 PM - 3:30 PM Ballroom	<i>UNDERGRADUATE FOOD PREFERENCES IN YAKELEY DINING HALL</i>	34
Palmer, Jackie	9:30 AM - 11:30 AM Ballroom	<i>POST PROCESSING MICROBIAL CONTROL OF PEELED CHESTNUTS</i>	86
Palmeri, Loren	9:30 AM - 11:30 AM Ballroom	<i>RELATIONSHIP BETWEEN MOLECULAR MECHANISM AND MODE OF INHERITANCE</i>	67
Pandey, Priyanka	9:30 AM - 11:30 AM Ballroom	<i>A SURVEY OF CULTIVATED TOMATO VARIETIES IDENTIFIES FOUR NEW MUTANT ALLELES AT THE GREEN- FLESH LOCUS</i>	67
Pankey, Emily	9:30 AM - 11:30 AM Gold Room	<i>THE EFFECTS OF SHORELINE DWELLING DENSITY AND INVASIVE ZEBRA MUSSELS ON GROWTH RATE OF LITTORAL FISH IN LAKES</i>	67

Paris, Alexander	10:00 AM Parlor A	<i>WARHOL: A CRITICAL ANALYSIS</i>	67
Parker, Lisa	3:00 PM Lake Huron Room	<i>QUANTIFYING CARBON SEQUESTERED IN MSU-OWNED FORESTS</i>	67
Parker, Nathan	9:30 AM - 11:30 AM Ballroom	<i>COORDINATED ORGAN DEVELOPMENT IN DROSOPHILA LARVAE</i>	23
Pathak, Anna	9:45 AM Parlor A	<i>THE ESSENCE OF IMAGES</i>	80
Patrick, Samantha	1:30 PM - 3:30 PM Gold Room	<i>COLLEGE STUDENTS' PREFERENCES OF DESIGN AND SUSTAINABLE FEATURES IN RESIDENTIAL LIVING ENVIRONMENTS</i>	68
Pawelec, Kendell	1:30 PM - 3:30 PM Ballroom	<i>MATHEMATICAL MODELING OF STEM CELL RESPONSE TO POLYELECTROLYTE MULTILAYER FILMS</i>	68
Pawloski, Ryan	1:30 PM - 3:30 PM Ballroom	<i>BIOSYNTHESIS OF GOLD NANOWIRES</i>	68
Peshek, Kathleen	1:30 PM - 3:30 PM Gold Room	<i>AFFECTS OF AGRICULTURAL METHODS ON CROP MUTUALISMS</i>	68
Peshek, Kathleen	9:30 AM - 11:30 AM Gold Room	<i>USING DENDROCHRONOLOGICAL TECHNIQUES TO INVESTIGATE THE EFFECTS OF GLOBAL WARMING ON LARIX LARICINA</i>	55
Peterka, Amanda	1:15 PM Lake Superior Room	<i>STEEL: HOT METAL, COLD REALITY</i>	58
Peterson, Lauren	9:30 AM - 11:30 AM Ballroom	<i>COMPARISON OF INNOVATIVE BROMINATED AND CHLORINATED POLYSTYRENE HYDANTOIN POLYMERS FOR HOUSEHOLD WATER TREATMENT</i>	68
Petit, Alex	9:30 AM - 11:30 AM Gold Room	<i>EXPLORING SCIENTIFIC AND ARTISTIC APTITUDE</i>	83
Pike, Chelsea	1:30 PM - 3:30 PM Gold Room	<i>DOES THE ABILITY TO CRACK BONE IN ADULTHOOD SLOW SKULL DEVELOPMENT?</i>	89
Plichta, Christine	1:30 PM - 3:30 PM Gold Room	<i>PATTERNS OF SKULL DEVELOPMENT IN WILD CARNIVORES</i>	26
Pluda, Allison	9:30 AM - 11:30 AM Gold Room	<i>INFERRING A PETROGENETIC HISTORY USING THE GEOCHEMISTRY OF OLIVINE CRYSTALS IN MANTLE XENOLITHS</i>	69
Polan, Carole	1:30 PM - 3:30 PM Ballroom	<i>ENTERTAINMENT AND CULURE IN MOROCCO AND CANADA</i>	32
Pollitt, Andrea	3:00 PM Lake Superior Room	<i>SPHERE - AN EXPERIMENT IN SIMPLIFYING GAMEPLAY, SCOPE AND CONTROLS IN VIDEO GAMES TO FACILITATE GREATER PLAYER IMMERSION</i>	69
Pollitt, Andrea	1:30 PM Lake Superior Room	<i>JURRASIC COMMANDER POSTMORTEM</i>	87
Porteus, Collin	9:30 AM Tower Room	<i>THE MATTRESS SOURCE</i>	82

Poteracki, James	10:00 AM Lake Huron Room	<i>FUNCTIONAL MRI USING VASCULAR SPACE OCCUPANCY (VASO) AND VASCULAR SPACE OCCUPANCY WITH TISSUE SUPPRESSION (VAST)</i>	69
Prasad, Anupama	2:00 PM Lake Erie Room	<i>THE IMPLICATIONS OF ELIMINATING THE PROPERTY TAX</i>	69
Prince, Ashlee	9:30 AM - 11:30 AM Ballroom	<i>FUNCTIONAL MRI USING VASCULAR SPACE OCCUPANCY (VASO) AND VASCULAR SPACE OCCUPANCY WITH TISSUE SUPPRESSION (VAST)</i>	33
Prohaska, Mike	9:30 AM - 11:30 AM Gold Room	<i>LOW-MAINTENANCE ROADSIDE ALTERNATIVES FOR THE PROMOTION OF ECOLOGICAL RESPONSIBILITY</i>	57
Pruett, Natalie	9:30 AM - 11:30 AM Ballroom	<i>DOING BUSINESS IN THE UNITED STATES: STARTING A BUSINESS</i>	70
Purdy, Christopher	1:30 PM - 3:30 PM Ballroom	<i>A CRITICAL VIEW OF THE CENTERS FOR DISEASE CONTROL AND PREVENTION'S IMMUNIZATION SCHEDULE</i>	40
Rademacher, Adam	1:00 PM Lake Superior Room	<i>A NEW GREEN ECONOMY</i>	70
Rajasekhar, Rebecca	9:30 AM - 11:30 AM Gold Room	<i>DEVELOPMENT OF A QUALITY OF LIFE INVENTORY FOR THE HEARING IMPAIRED</i>	73
Ranasinghe, Romali	1:30 PM - 3:30 PM Ballroom	<i>BIOSYNTHESIS OF GOLD NANOPARTICLES</i>	70
Rasmussen, Laura	1:30 PM Parlor C	<i>VARIATIONS ON AMERICA</i>	39
Ratzloff, Elizabeth	9:30 AM - 11:30 AM Ballroom	<i>THE EFFECTS OF POLITICAL PARTISANSHIP ON BELIEFS ABOUT GLOBAL WARMING WITHIN A SCIENTIFIC COMMUNITY</i>	70
Rau, Linda	9:30 AM - 11:30 AM Gold Room	<i>TEACHERS VERBAL BEHAVIORS ACROSS CONTEXTS WITH NATIVE AND NON-NATIVE SPEAKERS OF ENGLISH IN PRESCHOOL PROGRAMS FOR AT-RISK CHILDREN</i>	70
Redford, Daniel	9:30 AM - 11:30 AM Ballroom	<i>DOING BUSINESS IN THE UNITED STATES: STARTING A BUSINESS</i>	70
Reed, Emily	9:30 AM - 11:30 AM Gold Room	<i>LOW-MAINTENANCE ROADSIDE ALTERNATIVES FOR THE PROMOTION OF ECOLOGICAL RESPONSIBILITY</i>	57
Reedy, Shayna	3:00 PM Parlor C	<i>CHOREOGRAPHY AS RESEARCH-RESEARCH AS CHOREOGRAPHY</i>	73
Reilly-King, Thomas	11:45 AM Tower Room	<i>MEANTIME</i>	78
Rice, Jessica	9:30 AM - 11:30 AM Ballroom	<i>CALMODULIN INHIBITION AFFECTS DEFLAGELLATION RATE IN CHLAMYDOMONAS REINHARDTII</i>	71
Rice, Jessica	1:30 PM - 3:30 PM Gold Room	<i>DEVELOPMENT OF THEORY OF MIND AND DIVISION OF COGNITIVE LABOR</i>	46
Richards, Ernest	9:30 AM - 11:30 AM Ballroom	<i>ALGAL LIPID SYNTHESIS AND BIOFUELS PRODUCTION</i>	71

Ridenour, Chelsea	1:30 PM - 3:30 PM Gold Room	<i>UNCOVERING THE SILENCE: YOUNG WOMEN INVISIBLE IN SUDAN'S CIVIL WAR</i>	71
Riedy, Brian	1:45 PM Lake Erie Room	<i>THE MUSLIM BROTHERHOOD AND EGYPTIAN POLITICS</i>	71
Riedy, Andrew	12:15 PM Lake Huron Room	<i>MUTATIONAL EFFECTS OF MYOSIN 15A: THE CORRELATION OF MYOSIN 15A AND HEARING LOSS</i>	71
Rin, I	9:30 AM - 11:30 AM Ballroom	<i>FUNCTIONAL MRI USING VASCULAR SPACE OCCUPANCY (VASO) AND VASCULAR SPACE OCCUPANCY WITH TISSUE SUPPRESSION (VAST)</i>	33
Roche, Laura	9:30 AM - 11:30 AM Ballroom	<i>AN INVESTIGATION OF THE RELATIONSHIP OF SAMPLE SIZE AND MEAN LENGTH OF UTTERANCE FOR CHILDREN WITH DEVELOPMENTAL LANGUAGE IMPAIRMENT</i>	39
Rodriguez, Tanya	1:15 PM Lake Erie Room	<i>EDUCATION AND RECONCILIATION IN NORTHERN IRELAND</i>	71
Roenicke, Tyler	1:30 PM - 3:30 PM Ballroom	<i>SEM ANALYSIS OF CROSS-LINKED POLYACRYLAMIDE</i>	72
Roh, Jeong-hwan	1:30 PM - 3:30 PM Gold Room	<i>STUDY OF POLYMATHS: NOBEL PRIZE WINNERS IN ECONOMICS</i>	72
Root, Mallory	10:15 AM Lake Superior Room	<i>FARE CHANCE</i>	87
Rose, Morgan	1:30 PM - 3:30 PM Gold Room	<i>THE STATUS OF GEOGRAPHIC RACIAL EQUALITY IN THE MUNICIPALITIES OF SEATTLE</i>	72
Rossman, Sam	11:00 AM Parlor B	<i>HISTORICAL DECLINES IN SEAGRASS ABUNDANCE REVEALED THROUGH BOTTLENOSE DOLPHIN STABLE ISOTOPE ANALYSIS</i>	72
Roth, Alison	1:30 PM - 3:30 PM Ballroom	<i>PROTEIN SECRETION</i>	72
Roth, Veronica	1:15 PM Green Room	<i>ADULT STUDENTS AND COMPUTER SKILLS IN MID-MICHIGAN</i>	72
Rowe, Hannah	1:30 PM - 3:30 PM Ballroom	<i>IDENTIFICATION OF THE MOLECULAR SIGNALS INVOLVED IN THE RESPONSE OF NEISSERIA GONORRHOEAE TO HOST CELL CONTACT</i>	73
Rudnik, Daniel	9:30 AM - 11:30 AM Ballroom	<i>CLICK CHEMISTRY POLYMERS</i>	73
Ryba, Michelle	3:00 PM Parlor C	<i>CHOREOGRAPHY AS RESEARCH-RESEARCH AS CHOREOGRAPHY</i>	73
Salhadar, Samy	9:30 AM - 11:30 AM Ballroom	<i>COORDINATED ORGAN DEVELOPMENT IN DROSOPHILA LARVAE</i>	23
Sanders, Nathan	9:30 AM - 11:30 AM Gold Room	<i>PHOTOMETRIC SURVEY OF GLOBULAR CLUSTER SYSTEMS OF EARLY-TYPE GALAXIES</i>	73
Sanders, Stephanie	9:30 AM - 11:30 AM Gold Room	<i>DEVELOPMENT OF A QUALITY OF LIFE INVENTORY FOR THE HEARING IMPAIRED</i>	73

Sbar, Joseph	1:15 PM Parlor A	<i>READING BETWEEN THE LIONS: EXPLAINING CONTINUOUS NARRATIVE IN THE LION HUNT RELIEFS FROM THE PALACE OF ASHURBANIPAL</i>	74
Schlee, Kelsey	1:30 PM - 3:30 PM Gold Room	<i>PECTIC GELS AS AN EXPRESSION OF FUSARIUM HEAD BLIGHT RESISTANCE IN WHEAT</i>	74
Schneider, Emily	9:30 AM - 11:30 AM Ballroom	<i>IMPROVING THE FACEBOOK MOBILE INTERFACE TO INCREASE USABILITY</i>	28
Schneider, Emily	1:30 PM - 3:30 PM Ballroom	<i>SPEED MATTERS PASSENGER EXPERIENCE AND INTENTION OF USE OF PUBLIC VS PRIVATE TRANSPORTATION</i>	74
Schraufnagle, Doug	10:45 AM Green Room	<i>EXPLORING THE MICHIGAN STATE UNIVERSITY ISRAELITE SAMARITAN SCROLL COLLECTION: TRANSCULTURATION AND THE INTERNATIONAL SUNDAY SCHOOL CONVENTIONS</i>	74
Schroeder, Noel	1:30 PM - 3:30 PM Gold Room	<i>DO MEANINGFUL MATCHES PROMOTE NUMBER DEVELOPMENT?: ONE-TO-ONE CORRESPONDENCE WITH SIMULATED DISTRIBUTED OBJECTS</i>	75
Schultz, Nick	10:45 AM Tower Room	<i>SIDESHOW</i>	75
Schurig, Ashley	1:15 PM Tower Room	<i>EQUAL PAY FOR EQUAL PLAY: DEVELOPMENTAL CHANGE IN YOUNG CHILDRENS FAIRNESS CONCERNS AND COOPERATION</i>	29
Scime, Ian	9:30 AM - 11:30 AM Ballroom	<i>POLYMATHY OF NOBEL PEACE PRIZE LAUREATES</i>	17
Semivan, James	11:30 AM Tower Room	<i>WIND POWER</i>	75
Servoss, Jamie	9:30 AM - 11:30 AM Ballroom	<i>AN EXPLORATION OF MARRIAGE PRACTICES AMONG COLLEGE WOMEN IN INDIA</i>	75
Shah, Jay	1:30 PM - 3:30 PM Ballroom	<i>PEMPHIGUS VULGARIS DIFFERS AMONG MALES AND FEMALES</i>	75
Shaik, Asra	1:30 PM - 3:30 PM Ballroom	<i>SUMOYLATION ON THE CATALYTIC DOMAIN OF SERTHR KINASES IN SACCHAROMYCES CEREVISIAE</i>	75
Shavaliar, Megan	11:30 AM Parlor B	<i>SHEDDING AND PERSISTENCE OF VIRAL HEMORRHAGIC SEPTICEMIA VIRUS IN SURVIVING FISH</i>	75
Shaw, Kelly	1:30 PM - 3:30 PM Ballroom	<i>FUNCTIONAL STUDIES OF C-KIT MUTATIONS OBSERVED IN CANINE MAST CELL TUMORS</i>	76
Sheldon, Elizabeth	9:30 AM - 11:30 AM Gold Room	<i>INFLUENCE OF GENDER ON CORTICAL ACTIVATION</i>	20
Sherbeck, John	9:30 AM - 11:30 AM Ballroom	<i>USING FORWARD AND REVERSE GENETIC APPROACHES TO IDENTIFY PLASTID DIVISION COMPONENTS</i>	76
Shillair, Daniel	3:00 PM Lake Superior Room	<i>SPHERE - AN EXPERIMENT IN SIMPLIFYING GAMEPLAY, SCOPE AND CONTROLS IN VIDEO GAMES TO FACILITATE GREATER PLAYER IMMERSION</i>	69
Shrestha, Angela	10:30 AM Lake Huron Room	<i>GENETIC MAPPING OF A GENE CONTROLLING FLOWERING IN PLANTS</i>	76

Siciliano, Alexandra	9:45 AM Parlor A	<i>THE ESSENCE OF IMAGES</i>	80
Sidge, Jennifer	1:30 PM - 3:30 PM Ballroom	<i>A COMPARISON OF THE GENETIC DIVERSITY OF THE LYME DISEASE PATHOGEN, BORRELIA BURGDORFERI, FROM ENDEMIC AND RECENTLY-INVADDED BLACKLEGGED TICK POPULATIONS IN MICHIGAN</i>	76
Simpson, Leah	10:15 AM Parlor C	<i>UNDERSTANDING KEY COMPONENTS OF NUTRITION ENVIRONMENTS, POLICIES AND PROGRAMS IN SCHOOLS AND THEIR IMPACT ON STUDENTS DIETS</i>	57
Singh, Manisha	1:30 PM - 3:30 PM Ballroom	<i>THE EFFECT OF MEDICAL TRUST IN THE KINKEEPERSM PROGRAM: COMMUNITY HEALTH WORKER PERSPECTIVE</i>	44
Sinkler, Christopher	11:30 AM Lake Huron Room	<i>CHARACTERIZATION OF THE GUN201 GENE FAMILY, A NOVEL DOMAIN INVOLVED IN PLASTID SIGNALING IN ARABIDOPSIS THALIANA</i>	76
Sinkoff, Jacob	9:30 AM - 11:30 AM Ballroom	<i>CLONAL DIVERSITY OF BURKHOLDERIA CEPACIA COMPLEX FROM CLINICAL AND ENVIRONMENTAL SOURCES</i>	77
Siporin, Robert	10:30 AM Lake Erie Room	<i>THE SYMBOLIC AND REALISTIC POSSIBILITIES OF BARACK OBAMA'S PRESIDENCY</i>	77
Skaggs, Kristin	1:30 PM - 3:30 PM Ballroom	<i>NPR COVERAGE OF THE 2008 PRESIDENTIAL ELECTION</i>	77
Skrocki, Thomas	9:30 AM - 11:30 AM Ballroom	<i>POST PROCESSING MICROBIAL CONTROL OF PEELED CHESTNUTS</i>	86
Skrzypczak, Meredith	11:15 AM Lake Superior Room	<i>DIVERSITY OF ETHNICITY IN ENTERTAINMENT AND CULTURE BETWEEN THE UNITED STATES AND JAPAN</i>	27
Slavsky, Josephine	9:30 AM - 11:30 AM Gold Room	<i>3-D COMPUTER-BASED MODEL OF AN ARCHAEOLOGICAL SITE ON THE ISLAND OF CRETE</i>	77
Smith, Christopher	9:30 AM - 11:30 AM Ballroom	<i>THE CHICAGO WORKSHOP MODEL: NORMALIZING OR FRAGMENTING SCIENTIFIC COLLABORATION?</i>	48
Smith, Julia	9:30 AM - 11:30 AM Gold Room	<i>PERCEPTIONS AND REALITIES OF THE THREAT OF COUGARS AMONG HUMANS</i>	77
Smith, Kelly	1:30 PM - 3:30 PM Gold Room	<i>EFFECTS OF MOBILIZATION EXERCISES ON HORSES RANGE OF MOTION OVER A 3-MONTH PERIOD</i>	77
Smith, Taylor	9:30 AM Tower Room	<i>THE MATTRESS SOURCE</i>	82
Snowdin, Meaghan	10:15 AM Parlor C	<i>UNDERSTANDING KEY COMPONENTS OF NUTRITION ENVIRONMENTS, POLICIES AND PROGRAMS IN SCHOOLS AND THEIR IMPACT ON STUDENTS DIETS</i>	57
Sommer, Bruno	3:00 PM Lake Superior Room	<i>SPHERE - AN EXPERIMENT IN SIMPLIFYING GAMEPLAY, SCOPE AND CONTROLS IN VIDEO GAMES TO FACILITATE GREATER PLAYER IMMERSION</i>	69

Son, SungMo	9:30 AM - 11:30 AM Ballroom	<i>COMPARISON OF K+, NA+ AND CA2+ CURRENT DENSITY IN DORSAL ROOT GANGLIA NEURONS FROM MREN2(27) HYPERTENSIVE AND CONTROL RATS</i>	78
Sparks, Stephanie	10:00 AM Tower Room	<i>COCKNEY RHYMING SLANG</i>	78
Sparks, Stephanie	11:45 AM Tower Room	<i>MEANTIME</i>	78
Sperry, Miranda	9:30 AM - 11:30 AM Ballroom	<i>IMPROVING THE FACEBOOK MOBILE INTERFACE TO INCREASE USABILITY</i>	28
Sperry, Miranda	1:30 PM - 3:30 PM Ballroom	<i>INTERFACE DESIGN AND THE USABILITY OF GPS DEVICES</i>	78
Starks, Jordan	1:00 PM Parlor C	<i>PERFORMANCE GENEALOGY: ARTS THROUGH THE AGES</i>	42
Steffes, Zach	10:00 AM Lake Huron Room	<i>FUNCTIONAL MRI USING VASCULAR SPACE OCCUPANCY (VASO) AND VASCULAR SPACE OCCUPANCY WITH TISSUE SUPPRESSION (VAST)</i>	69
Steffes, Matt	9:30 AM - 11:30 AM Ballroom	<i>FIGHTING THE</i>	85
Stivers, Adam	1:45 PM Tower Room	<i>SOCIAL EXCLUSION AND SOCIAL DILEMMAS</i>	79
Strack, Jennifer	10:30 AM Parlor A	<i>PIN-UP ART FROM THE 1940'S AND 50'S</i>	79
Strauch, Alexander	1:30 PM - 3:30 PM Gold Room	<i>MAMMALIAN SKULL DEVELOPMENT</i>	79
Stringer, David	10:00 AM Parlor B	<i>CHANGES IN LAKE PRODUCTIVITY THROUGH SEDIMENT CHRONOLOGIES</i>	79
Sullivan, Ryan	1:30 PM - 3:30 PM Ballroom	<i>ENGINEERING IMPROVED TRP REPRESSOR PROTEIN CRYSTAL CONTACTS USING GENE SYNTHESIS</i>	79
Sutton, Chadwick	1:30 PM - 3:30 PM Ballroom	<i>RELATIONSHIP FORMATION IN COLLEGE DATING: A LOOK AT THE EFFECTS OF LOVE ATTITUDES, SOCIAL NETWORKS, ORGANIZATIONAL NETWORKS, ONLINE NETWORKS, FWBRS, AND CHANCE ENCOUNTERS</i>	79
Sutton, Megan	9:30 AM - 11:30 AM Gold Room	<i>CHILD AND ADULT USE OF PROSODY IN SYNTACTIC DISAMBIGUATION</i>	80
Sutton, Megan	1:30 PM - 3:30 PM Gold Room	<i>SCALE COMPETITION AND CHILDREN'S UNDERSTANDING OF GRADABLE ADJECTIVES</i>	30
Swartz, Ashley	1:30 PM - 3:30 PM Ballroom	<i>OPTIMIZING THE FABRICATION OF HYDROXYAPATITE CERAMIC TISSUE SCAFFOLDS</i>	80
Sykes, David	1:30 PM - 3:30 PM Ballroom	<i>DETERMINING GENES INVOLVED IN SYMBIOSIS OF HETEROHABDITUS BACTERIOPHORA AND PHOTORHABDUS LUMINESCENS</i>	80

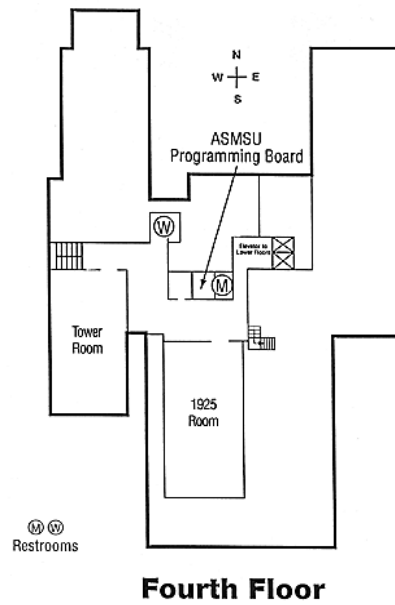
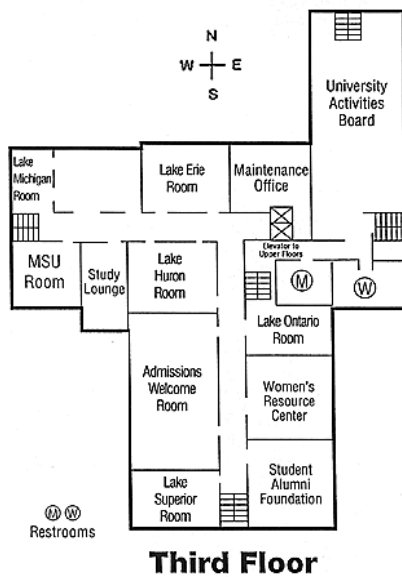
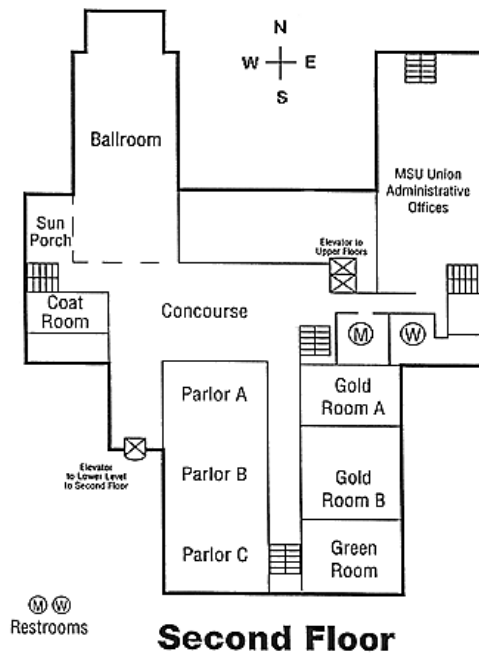
Tackett, Ryan	9:30 AM - 11:30 AM Ballroom	<i>OPEN CHARACTER BUILDER</i>	80
Takala, Valerie	1:30 PM - 3:30 PM Gold Room	<i>PATTERNS OF SKULL DEVELOPMENT IN WILD CARNIVORES</i>	26
Tanner, Amanda	9:45 AM Parlor A	<i>THE ESSENCE OF IMAGES</i>	80
Tans, Erin	9:30 AM - 11:30 AM Gold Room	<i>EFFECTS OF DRESSAGE TRAINING ON PERFORMANCE IN HALT TO TROT AND TROT TO HALT TRANSITIONS</i>	81
Tashjian, Marie	9:30 AM - 11:30 AM Ballroom	<i>GEOGRAPHIC RACIAL EQUALITY IN OAKLAND COUNTY, MICHIGAN</i>	81
Taylor, Sarah	9:30 AM - 11:30 AM Gold Room	<i>SHE AINT NOTHIN BUT A HOOCHIE MAMA: THE EFFECT OF POPULAR MUSIC VIDEOS ON THE PERCEPTION OF BLACK WOMEN</i>	81
Tazzia, Samantha	9:30 AM - 11:30 AM Ballroom	<i>THE EFFECTS OF TAGLINES ON CLICK-THROUGH RATES: MOBILE ADVERTISING</i>	81
Tazzia, Samantha	1:30 PM - 3:30 PM Ballroom	<i>MULTIPURPOSE INTERACTIVE SYSTEMS (MIS): USABILITY AND WORKLOAD</i>	81
Terry, Nicquel	11:15 AM Lake Superior Room	<i>DIVERSITY OF ETHNICITY IN ENTERTAINMENT AND CULTURE BETWEEN THE UNITED STATES AND JAPAN</i>	27
Thiede, Alanna	9:30 AM - 11:30 AM Gold Room	<i>THE USE OF COLOR AS AN IMPLICIT RESTRICTION IN CHILD'S LANGUAGE</i>	16
Thompson, Andrea	1:30 PM - 3:30 PM Ballroom	<i>REDEFINING BIOAVAILABILITY</i>	45
Tomczak, Ashley	1:30 PM - 3:30 PM Gold Room	<i>THE DARK SIDE OF LIGHT: NIGHTTIME ILLUMINATION DISTURBS THE FUNCTION OF THE BRAIN CLOCK</i>	82
Tootalian, Nicholas	9:30 AM Tower Room	<i>THE MATTRESS SOURCE</i>	82
Tovar, Angelica	1:30 PM - 3:30 PM Ballroom	<i>USING AN INDUCIBLE PROTEIN DEGRADATION SYSTEM TO STUDY ESSENTIAL GENES IN BACILLUS SUBTILIS</i>	82
Towner, Ashley	9:30 AM - 11:30 AM Ballroom	<i>MICHIGAN POLICY NETWORK</i>	82
Townsend, April	1:30 PM - 3:30 PM Ballroom	<i>A CRITICAL VIEW OF THE CENTERS FOR DISEASE CONTROL AND PREVENTION'S IMMUNIZATION SCHEDULE</i>	40
Trombly, Genevieve	1:30 PM - 3:30 PM Ballroom	<i>A BUGS EYE VIEW</i>	82
Trusty, Andrew	1:30 PM - 3:30 PM Ballroom	<i>FRACTURE SURFACES</i>	82
Ulrich, Allison	1:30 PM - 3:30 PM Ballroom	<i>IDENTIFICATION OF A NATURAL PRODUCT THAT REDUCES OBESITY AND ADIPOSITY</i>	83
Vallentine, Andrew	11:15 AM Tower Room	<i>HIGH STEP: A STORY OF THE SPARTAN MARCHING BAND</i>	83

Vallo, Andrew	9:30 AM - 11:30 AM Ballroom	<i>GENOTYPING TO IDENTIFY ENHANCED <i>Wnt</i> SIGNALING IN MICE</i>	83
Van De Velde, Nicole	1:00 PM Tower Room	<i>FUNCTIONAL ANATOMY OF READING STORIES VERSUS SOLVING MATH PROBLEMS USING FMRI</i>	26
VanDyke, Megan	9:30 AM - 11:30 AM Gold Room	<i>EXPLORING SCIENTIFIC AND ARTISTIC APTITUDE</i>	83
VanDyke, Megan	1:30 PM - 3:30 PM Gold Room	<i>EXPLORING THE SCIENCE OF CREATIVITY</i>	83
VanLandschoot, Katie	9:30 AM - 11:30 AM Ballroom	<i>CLASSIFYING TYPICALLY DEVELOPING TODDLERS AND PRESCHOOLERS USING THE COMMUNICATION FUNCTION CLASSIFICATION SYSTEM (CFCS)</i>	84
Vasko, Danielle	1:30 PM - 3:30 PM Ballroom	<i>THE HARMFUL AFFECTS OF LEAD</i>	84
Velliky, Elizabeth	2:30 PM Green Room	<i>PEOPLES' PARK: ARCHAEOLOGY AT MSU</i>	84
Vercammen, Emily Rose Medow	9:30 AM - 11:30 AM Gold Room	<i>LOS PANTALONES GREEN: CONSTRAINTS ON SPANISH-ENGLISH CODE-SWITCHING IN NOUN PHRASES</i>	84
Viaches, Kristi	9:30 AM - 11:30 AM Gold Room	<i>DEVELOPMENT OF A QUALITY OF LIFE INVENTORY FOR THE HEARING IMPAIRED</i>	73
Vielbig, Laura	9:30 AM - 11:30 AM Gold Room	<i>COMPARISON OF PHYSICAL ACTIVITY LEVELS DURING STRUCTURED AND UNSTRUCTURED ACTIVITIES IN CHILDREN AND ADOLESCENTS</i>	84
Wallace, Jessica	9:30 AM - 11:30 AM Gold Room	<i>DOES THE PLURAL CONTAIN THE SINGULAR?</i>	85
Wang, Sunny Ching Hui	10:45 AM Parlor A	<i>THE NEW IN THE OLD: STEPHEN BERKMAN</i>	85
Wangler, Renee	9:30 AM - 11:30 AM Gold Room	<i>OUTCOMES OF STUDENT INTERNSHIP EXPERIENCES IN AGRISCIENCE AND NATURAL RESOURCES TEACHER EDUCATION AT MICHIGAN STATE UNIVERSITY</i>	85
Webb, Alexander	9:30 AM - 11:30 AM Ballroom	<i>WHERE SHOULD THE MONEY GO? AN ANALYSIS OF THE WAR ON MALARIA</i>	85
Weinman, Dani Michele	9:30 AM - 11:30 AM Ballroom	<i>MICROCOMPUTED TOMOGRAPHY ANALYSIS</i>	85
Weiss, Erica	9:30 AM - 11:30 AM Gold Room	<i>MICHIGAN POLICY NETWORK</i>	86
Weiss, Kayla	9:30 AM - 11:30 AM Gold Room	<i>THE EFFECT OF TGF-1 ON CELL PROLIFERATION IN THE BOVINE MAMMARY GLAND DURING THE DRY PERIOD</i>	86
White, Jennifer	1:00 PM Green Room	<i>ASSESSING THE ACCESS TO HEALTHCARE: THE AFRICAN-AMERICAN INFANT MORTALITY RATE</i>	86
Whitman, Joshua	1:30 PM - 3:30 PM Ballroom	<i>ELECTROACTIVE BIOMIMETRIC TO SIMULATE SACROMERE FUNCTIONS</i>	86

Wiederoder, Michael	9:30 AM - 11:30 AM Ballroom	<i>OPTIMIZATION OF AN ELECTROSPUN NITROCELLULOSE CAPTURE PAD FOR BIOSENSING APPLICATIONS OF ESCHERICHIA COLI 0157:H7</i>	40
Wiederoder, Michael	9:30 AM - 11:30 AM Ballroom	<i>POST PROCESSING MICROBIAL CONTROL OF PEELED CHESTNUTS</i>	86
Wiederoder, Sara	9:30 AM - 11:30 AM Ballroom	<i>ELECTROSPUN TIN COATED ALUMINA FIBERS FOR GAS SENSING APPLICATIONS</i>	87
Wierenga, Bert	1:30 PM Lake Superior Room	<i>JURRASIC COMMANDER POSTMORTEM</i>	87
Wild, Kristin	10:15 AM Lake Superior Room	<i>FARE CHANCE</i>	87
Wildbill, Andrew	2:45 PM Lake Superior Room	<i>AMERICAN INDIAN'S IN POPULAR CULTURE</i>	87
Willis, Bianca	11:00 AM Lake Erie Room	<i>ENSLAVED WOMEN'S SEXUALITY</i>	87
Wilt, Kelly	1:30 PM - 3:30 PM Gold Room	<i>VACCINES AND BIOTERRORISM</i>	23
Winger, Benjamin	11:45 AM Parlor B	<i>DEVELOPMENT OF ANTIMICROBIAL FILMS BASED ON PLA WITH IMPLICATIONS FOR FOOD PACKAGING</i>	42
Winkler, Nelson	9:30 AM - 11:30 AM Ballroom	<i>SEEING BETTER: OPTIMIZING SURGICALLY INDUCED ASTIGMATISM CORRECTION FACTORS FOR CATARACT SURGERY</i>	88
Winkler, Nelson	1:30 PM - 3:30 PM Ballroom	<i>METABOLOMIC ANALYSIS USING FEMTOSECOND LASER-INDUCED IONIZATIONDISSOCIATION (FS-LID)</i>	87
Winkler, Paige	9:30 AM - 11:30 AM Ballroom	<i>EXCLUSION ANALYSIS OF CANDIDATE GENES UNDERLYING HEREDITARY ECTOPIC URETERS IN ENTLEBUCHER DOGS</i>	88
Wong, Justin	9:30 AM - 11:30 AM Ballroom	<i>CONSUMER RESPONSE TO MOBILE ADVERTISING TARGETED BY LOCATION AND PROXIMITY</i>	61
Wong, Justin	1:30 PM - 3:30 PM Gold Room	<i>DRIVER VISIBILITY, NAVIGATIONAL DISPLAYS AND CAR MAINTENANCE</i>	88
Woods, Joshua	1:30 PM - 3:30 PM Ballroom	<i>PRODUCTION OF HIGH VALUE OILS FROM ALGAE</i>	50
Woodworth, Hillary	1:30 PM - 3:30 PM Ballroom	<i>IDENTIFYING THE ROLE OF DOCOSAHEXAENOIC ACID IN COLITIS-ASSOCIATED COLORECTAL CANCER</i>	88
Worden, Andrew	10:00 AM Lake Huron Room	<i>FUNCTIONAL MRI USING VASCULAR SPACE OCCUPANCY (VASO) AND VASCULAR SPACE OCCUPANCY WITH TISSUE SUPPRESSION (VAST)</i>	69
Worhatch, Richard	1:30 PM - 3:30 PM Gold Room	<i>MODELING ELECTRONIC CHARGE TRANSFER OF GOLD NANOPARTICLES AT THE ULTRAFast TIMESCALE</i>	88
Worley, Kathryn	9:30 AM - 11:30 AM Ballroom	<i>EXAMINATION OF COSMETIC POWDERS WITH A SEM</i>	89

Wright, Rachel	1:30 PM - 3:30 PM Gold Room	<i>DOES THE ABILITY TO CRACK BONE IN ADULTHOOD SLOW SKULL DEVELOPMENT?</i>	89
Wrobleski, Samantha	9:30 AM - 11:30 AM Ballroom	<i>RESEARCH TRAINING PROGRAM FOR UNDERGRADUATE STUDENTS IN BIOLOGICAL AND MATHEMATICAL SCIENCES (UBM)</i>	89
Yu, Dustin	9:30 AM - 11:30 AM Ballroom	<i>GEOGRAPHIC RACIAL EQUALITY</i>	89
Yuan, Fei	1:30 PM - 3:30 PM Gold Room	<i>SPEED OF LIGHT BY DISTANCE-TIME MEASUREMENT OF LASER PULSE</i>	89
Zwirner, Jessica	9:30 AM - 11:30 AM Gold Room	<i>TESTING SIZE AS AN IMPLICIT RESTRICTION ON THE DEFINITE ARTICLE IN CHILD LANGUAGE</i>	30
Zyskowski, Carli	1:30 PM - 3:30 PM Gold Room	<i>UNCOVERING THE SILENCE: YOUNG WOMEN INVISIBLE IN SUDAN'S CIVIL WAR</i>	71

Layout of MSU Union



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

**The 12th annual University Undergraduate Research and Arts Forum will be held on
Friday, April 16, 2010.**

MICHIGAN STATE
U N I V E R S I T Y