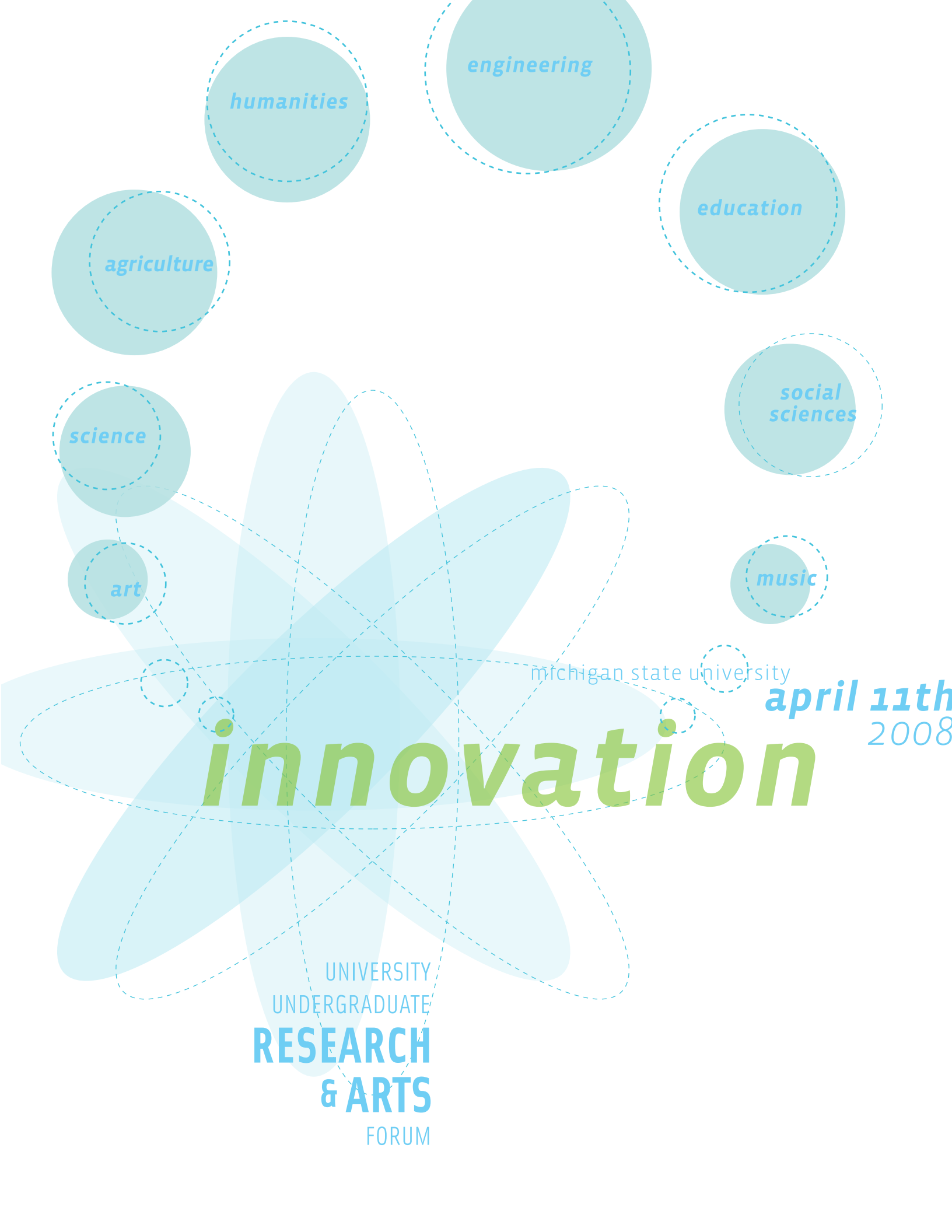

michigan state university

april 11th
2008

innovation

UNIVERSITY
UNDERGRADUATE
RESEARCH
& ARTS
FORUM

UNIVERSITY UNDERGRADUATE RESEARCH & ARTS FORUM

April 11, 2008

MSU Union

Welcome to the tenth annual Undergraduate Research and Arts Forum. Throughout the day, undergraduate students from diverse academic disciplines will present their outstanding research and creative endeavors.

Take time to walk through the poster displays in the Ballroom and ask students questions about their projects. Sit in on an oral presentation on a subject that you know little about, or observe a creative presentation in our newest category, performance demonstration.

Thank you for joining us as we celebrate the exciting work and impressive accomplishments of these emerging scholars.

MICHIGAN STATE UNIVERSITY

Undergraduate Research

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-Elmoor from the Honors College, and Dr. Korine Steinke Wawrzynski, Coordinator of Undergraduate Research. Thank you to Tom Summerhill, Janet Lillie, Janet Swenson, Tom Wolff, Kathy Doig, Steve van Nocker, Cass Book, and Mike Mazzeo for helping to find faculty judges. Finally, we thank the many dedicated faculty mentors who guided the projects presented today.

We offer special thanks to the UURAF Team: Lindsey Oehmen, Eric Jessup-Anger, Alysha Keegan, and Sandra Walther for helping with the coordination of this event, and to the faculty judges, room moderators, and volunteers for their support of the Forum. The cover art and UURAF graphic logo were designed by Neal Joseph Steeno, MSU '07.

Awards Ceremony

To recognize exemplary scholarly achievements, monetary prizes will be awarded. One first-place award ($100)* and one merit award ($50 each) will be given in each poster, oral presentation, and performance demonstration category. In addition, two grand prizes will be awarded to one program from science, mathematics, and engineering and one program from humanities, social sciences, and communication arts and sciences.

Please join us at 4:00 PM for the awards presentation in Parlors ABC during which the prize winners in the various categories will be announced. We encourage all participants to stay for the awards ceremony and invite their families and friends 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 would receive $100 each). The maximum amount awarded for groups with five or more members will be $500 for first-place awards and $250 for merit awards; this 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 mailed to the student at the end of the semester.

Table of Contents

Schedule of Events.....4

Schedule of Performance Demonstrations……5

Schedule of Oral Presentations…….....6-13

Schedule of Poster Presentations.....14-25

Abstracts.....26-117

Index of Students……118-146

Index of Faculty Mentors……147-150

Map.....151

2008 UURAF Schedule of Events

All events occur in the MSU Union

Time	Event
8:45 AM - 9:15 AM	Registration for morning poster and oral presentations
9:00 AM - 9:30 AM	Oral presenters download PowerPoint presentations onto computers in assigned rooms
9:30 AM - 11:30 AM	Display time and judging for morning posters
9:30 AM - 12:00 PM	Morning oral presentations
9:30 AM - 12:15 PM	Performance demonstrations
11:30 AM - 12:00 PM	Students take down morning poster displays
12:00 PM - 12:30 PM	Registration for afternoon oral presentations
12:30 PM - 1:00 PM	Oral presenters download PowerPoint presentations onto computers in assigned rooms
12:45 PM - 1:15 PM	Registration for afternoon posters
1:00 PM - 3:30 PM	Afternoon oral presentations
1:00 PM - 3:30 PM	Performance demonstrations
1:30 PM - 3:30 PM	Display time and judging for afternoon posters
3:30 - 4:00	Students take down afternoon poster displays
4:00 PM	Awards Ceremony Parlors ABC, Student Union

Registration and Information are located on the second floor concourse.

Light refreshments will be served at 9:00 AM and 2:00 PM on the second floor concourse

Performance Demonstrations

All performance demonstrations will occur in Parlors AB.

9:30 AM	Jeromy Hunt, Kristin Fulgoni, Lauren Glinke, Andy Huber, David Twigg	ART TRANSFORMATION
10:00 AM	Syhming Vong	UNTITLED
10:30 AM	Will Bonner	TOUCH N GO: A PHYSICALLY INTERACTIVE COMPUTER GAME
11:00 AM	Samantha Mitchell, Megan Brumbill, Christine Mccullough, Mary McGorey, Janelle Orser	EMBODYING SOCIAL ADVOCACY
11:30 AM	Gregg Gaddy, Nathaniel Bliton	LIGHT MUSIC
12 PM	Nathan Graham	MAGIC VIA MOTION TRACKING: A PROJECT FOR THE CHICAGO HISTORY MUSEUM
12:15 PM - 1:00 PM	BREAK	BREAK
1:00 PM	Mark Hsieh	MEDITATION
1:30 PM	Michael Wright, Simon Holoweiko, Mark Hsieh, Kevin Phillips, Kevin Smith	FRESHMAN BRASS QUINTET
2:00 PM	Mary Turcotte	PIANO STUDY AS RESEARCH OF SELF
2:30 PM	Nora Olson	SOPHOMORE BRASS QUINTET
3:00 PM	Laura Donnelly	LATIN AMERICAN MUSIC FOR THE SAXOPHONE: UNCOVERING A REGION OF MUSIC

Oral Presentations

Each presentation is alloted 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. Particpants and guests are asked not to enter or leave a room during a presentation.

Parlor A

Communication Arts & Sciences

9:30 AM	Kristen Lee	THE RACIALIZATION OF HAWAII NATIVE SENATOR BARACK OBAMA IN STATE AND NATIONAL MEDIA: A CROSS MEDIA ANALYSIS
9:45 AM	Shalane Walker	COVERAGE OF MENTAL ILLNESS IN AFRICAN-AMERICAN MAGAZINES
10:00 AM	Amanda Peterka, Alex Henderson	STEEL: HOT METAL, COLD REALITY
10:15 AM	Michael Jordan	BEING ARAB AMERICAN SINCE 9/11

Gold Room A

Cell & Molecular Biology

9:30 AM	Dennean Lippner	UNDERSTANDING THE LINK BETWEEN CELL DEATH AND DIABETIC BONE LOSS
9:45 AM	Jeffrey Ambrose	MODIFICATION OF CREATINE TRANSPORTER EXPRESSION IN MUSCLE CELLS
10:00 AM	Kathryn Fletcher	THE ROLE OF HREV-7 IN HUMAN MUTAGENESIS
10:15 AM	Jeffrey Swan	PEROXISOMAL FBOX PROTEINS
10:30 AM	Karren Lewis	POSSIBLE INVOLVEMENT OF SERUM AMYLOID A IN BREAST CANCER
10:45 AM	Blaire Varnes	CHANGES IN MYOBLAST ACTIVITY DURING PIG DEVELOPMENT ARE NOT EXPLAINED BY INHERENT DIFFERENCES IN PHENOTYPE OR GLOBAL GENE EXPRESSION PATTERNS
11:00 AM	Megan Goodall	EVALUATION OF GENE EXPRESSION IN INDUCTION OF ADIPOGENESIS: COMPARISON OF ADIPOGENESIS IN HUMAN AND CANINE MESENCHYMAL STEM CELLS
11:15 AM	Serina Mazzoni	CHARACTERIZATION OF THE TELOMERE PROTEIN POT1B IN TETRAHYMENA
11:30 AM	Alexander Brown	AP-1 AND ETS ACTIVATION LEVELS IN CANCEROUS AND NORMAL MAMMARY CELLS
11:45 AM	Stephanie Duperon	EFFECT OF RBF PROTEIN TURNOVER ON ITS ACTIVITY
12:00 PM	Tychele Turner	IDENTIFICATION AND ANALYSIS OF GAMMA AND BETA ACTIN PROTEIN INTERACTIONS WITHIN THE INNER EAR THROUGH THE USE OF A YEAST TWO HYBRID

Gold Room A

(continued)

Physical Sciences

1:00 PM	Lori Babcock	THE SEDIMENT RECORD OF PRODUCTIVITY FROM OLIGOTROPHIC LAKES: A MULTI-ELEMENT APPROACH
1:15 PM	Nathan Sanders	CHARACTERIZATION OF STARDUST DROPLET SIZE DISTRIBUTION
1:30 PM	Julie Krugler	BERYLLIUM ABUNDANCES IN SOLAR MASS STARS
1:45 PM	Jay Shah	PREPARATION AND CHARACTERIZATION OF PELLETED CARBON ELECTRODES
2:00 PM	Darya Howell, Dena Palasik	INVERSION AND HYDROGEN EXCHANGE IN 1,2-CYCLOPENTANEDIOLS: A GEOMETRICALLY CONSTRAINED MODEL FOR AQUEOUS PHASE GREEN CATALYTIC CARBOHYDRATE HYDROGENOLYSIS

Math

2:30 PM	Jeffrey Wyka, Dale Chapman	SOME PROPERTIES OF GENERALIZED FIBONACCI POLYNOMIALS
2:45 PM	Korey Carter, Todd Morra	FRACTAL IMAGES AND ITERATED FUNCTION SYSTEMS
3:00 PM	Kathryn Bonnen, Rachel Klavon	MATHEMATICAL STRATEGIES FOR TWO-PERSON COMBINATORIAL GAMES

Gold Room B

Social Science: History, Economics & Political Science-Group 1

9:30 AM	Kyle Mays	THE BLACK MIDDLE CLASS: A REINFORCEMENT OF WHITE VALUES, WHITE RACISM AND WHITE CULTURE
9:45 AM	Timothy Kaufmann	SOFTWARE PATENTABILITY AND THE EVOLUTION OF PATENT LAW
10:00 AM	Ryan Etzcorn	THE LAND OF SINIM: THE TAIPING REBELLION, CHINESE CIVIL WAR AND THE THEOLOGICAL PENETRATION OF THE WEST
10:15 AM	Joseph Orsini	PRIVATE INFORMATION AND AGENT EXPERIENCE IN NFL CONTRACT NEGOTIATIONS
10:30 AM	Benjamin Parmet	MARGINAL CONGRESS MEMBER SPONSORSHIP BEHAVIOR IN COMMITTEE POSTS
10:45 AM	Emily Adama	USING RELATIONSHIPS TO FIGHT POVERTY
11:00 AM	Megan Block	COMMUNITIES AS LEADERS IN REVERSING ECONOMIC DECLINE: REBUILDING CIVIL SOCIETY, INSTITUTIONS AND LEADERSHIP CAPACITY TO GROW LOCAL ENTREPRENEURS
11:15 AM	Danielle Ferry	HUMAN RIGHTS IN THE THIRD WORLD: THE COMMONWEALTH AND LA FRANCOPHONIE
11:30 AM	Jessica Schoenherr	WE SHALL NOT SURRENDER: KENNEDY, THE BERLIN CRISIS AND THE EFFECTIVE USE OF THE RHETORICAL PRESIDENCY

Social Science: History, Economics & Political Science-Group 2

1:00 PM	Srikanth Aravamuthan	HISTORY OF THE DOCTOR-PATIENT RELATIONSHIP IN WESTERN MEDICINE
1:15 PM	Kelly Savel	THE CHANGING FACE OF THE UNITED STATES BORDER PATROL
1:30 PM	Adam Wagner	COURTING DISASTER: STATE-BUILDING IN AFGHANISTAN
1:45 PM	Michael Carman	GLOBALIZATION AND HUMAN DEVELOPMENT
2:00 PM	Jeffrey Holycross	THE ECONOMICS OF TICKET SCALPING
2:15 PM	Andrew Woodson	ABAKUÁ SECRET SOCIETY: RELIGION, RACE AND CULTURE IN THE URBAN MATRIX OF CUBA
2:30 PM	John Beason	THE JOSHUA GENERATION: HIP HOP, STREET TRIBES AND THE DEVELOPMENT OF YOUTH CULTURE IN BENTON HARBOR, MI 1980-PRESENT
2:45 PM	Nicholas Micinski	CIVIL SOCIETY ORGANIZATIONS IN MUSLIM MINORITY COMMUNITIES: A COMPARISON
3:00 PM	Stefan Lanweremeyer-Katharios	THE G8 PROTESTS: IDEOLOGY, TACTICS AND STRUCTURE IN ACTION

Green Room

Agriculture and Environmental Studies—Group 1

9:30 AM	Emma Wils-Plotz	THE NUTRITIONAL EFFICACY OF MARES MILK IN NEONATAL PIGS: A MODEL FOR THE HUMAN INFANT
9:45 AM	Carolyn Gillen	USE OF EDGE HABITAT FOR FORAGING BY NORTHERN GOSHAWKS
10:00 AM	Whitney Allen	EQUINE ANATOMY STUDY
10:15 AM	Andrew Wildbill	CHARACTERIZATION OF PUTATIVE MIGRATORY AND SEX PHEROMONES IN PACIFIC LAMPREY
10:30 AM	Jenee Witherspoon	POTENTIAL NITROGEN CONTRIBUTION TO THE ENVIRONMENT FROM SIX TYPES OF EQUINE BEDDING
10:45 AM	Erin Tans	A STUDY OF TRANSITIONS BETWEEN DIFFERENT GAITS IN DRESSAGE HORSES
11:00 AM	Lila Zarski	AN ANALYSIS OF PRESSURE EXERTED BY DIFFERENT STYLES OF WINTER BLANKETS ON THE WITHERS OF HORSES

Agriculture and Environmental Studies—Group 2

1:00 PM	Britt Larson	THE RELATIONSHIP BETWEEN REIN TENSION AND NATURAL OSCILLATIONS OF THE HEAD AND NECK IN THE TROTTING HORSE
1:15 PM	Andreá Minella	IMPACT OF HAY PROTEIN QUALITY ON NITROGEN EXCRETION RATES IN THE MATURE HORSE
1:30 PM	Vanessa Knight, Laura Balgooyen, Sarah Cline, Jessica Zalucha	IMPACT OF EQUINE NUTRITION PRACTICES ON ENVIRONMENT
1:45 PM	Danielle Scheetz	ANTI MULLERIAN HORMONE IN HEIFERS WITH HIGH VERSUS LOW NUMBERS OF ANTRAL FOLLICLES GROWING DURING OVARIAN FOLLICULAR WAVES
2:00 PM	Mart Williams	BROWN AND RAINBOW TROUT MOVEMENT PATTERNS IN THE PINE RIVER, MANISTEE COUNTY, MICHIGAN, RELATIVE TO THE REMOVAL OF STRONACH DAM
2:15 PM	Jesse Zuehlke	GMOS IMPLEMENTATION AND REGULATION AROUND THE WORLD
2:30 PM	Jan-Michael Hessenauer	NON-LETHAL SAMPLING: CAN FISH FIN TISSUE PROVIDE RELIABLE STABLE ISOTOPE DATA
2:45 PM	Laura Bauson	EVALUATING THE ADDITION OF POSITIVE REINFORCEMENT FOR LEARNING A FRIGHTENING TASK A PILOT STUDY WITH HORSES

Lake Erie Room

Education

9:30 AM	Jaimee Gillon	STUDY OF ENGLISH LANGUAGE LEARNERS WITHIN A MAINSTREAM SECONDARY CLASSROOM
9:45 AM	Andrew VanEgmond	VIRTUAL HISTORY MUSEUM
10:00 AM	Jeffrey Seguin, Chelsey Dunning, Evan Yamanishi	EXAMINING URBAN TEACHER PREPARATION
10:15 AM	Maria A Feldpausch	PHYSICAL ACTIVITY FOR PERSONS WITH AUTISM: PARTICIPANT PERSPECTIVES
10:30 AM	Sam Rossmans	MISSING CONNECTIONS IN GLOBAL CHANGE
10:45 AM	Jessica Lang, Tracy Szutkowski	ROLES OF GRAPHICAL LITERACY IN STRUGGLING READERS' WRITING

Neurosciences

11:30 AM	Bradley Anderson, Maulik Dhandha, Michael Johnson, Matt Nies, Saumya Pathak, Kristin Ramus	CAN BRAIN FUNCTIONAL MRI MEASURE CENTRAL DRIVE DURING MUSCLE CONTRACTIONS
11:45 AM	Matthew Aardema	VARIATION IN A FEMALE SECONDARY SEXUAL CHARACTERISTIC MAY EXPLAIN ASYMMETRICAL MALE MATE SELECTION IN TIGER SWALLOWTAIL BUTTERFLIES, PAPILIO GLAUCUS AND P CANADENSIS
12:00 PM	Chris Riedinger, Doug Darden, Alex Jendrusina	COMPARING BRAIN ACTIVATION BETWEEN READING STORIES AND SOLVING MATH PROBLEMS USING FMRI
12:15 PM	Tiffany Prout	VALIDITY OF THE OMNI RPE SCALE ACROSS A WIDE RANGE OF PHYSICAL ACTIVITIES

Social Science: Psychology

1:00 PM	Nicole Lawless	PERSONALITY AND DECISION MAKING
1:15 PM	Melissa Cousino	CONTRIBUTING FACTORS OF JUVENILE DEPRESSION IN ADOLESCENTS WITH ADHD
1:30 PM	Michael Hunter	PERSONALITY AND SLINKIES
1:45 PM	Yang Chen	LOSS OF FACE, SOCIAL ANXIETY AND DEPRESSION AMONG ASIAN AMERICAN AND EUROPEAN AMERICAN COLLEGE STUDENTS
2:00 PM	Sandte Stanley	AGE AND RACE DIFFERENCES AND THEIR RELATION TO THE UNDERSTANDING OF HEALTH ISSUES REGARDING CERVICAL CANCER
2:15 PM	Brian Mund	THE EFFECTS OF HYPOCRISY ON THE THREAT OF EXCLUSION IN SOCIAL DILEMMAS

Lake Huron Room

Humanities-Group 1

9:30 AM	Debbie Labedz	CASE STUDIES IN GLOBALIZATION: THE LIVES AND WORK OF MONA HATOUM AND YINKA SHONIBARE
9:45 AM	Wil Rankinen	AN UPPER PENINSULA OF MICHIGAN VOWEL SYSTEM
10:00 AM	Sarah Kaye	THE TRANSMISSION OF REGIONAL VOCABULARY ACROSS GENERATIONS IN SOUTHEASTERN FRANCE
10:15 AM	Katie Deska	POSTFEMINISM AND WOMENS MUSIC
10:30 AM	Megan E. Sutton	MEASURING IDENTIFICATION OF NATIVE-LIKE SPANISH PRONUNCIATION
10:45 AM	Patricia Smith	FOR THE LAST TIME, I'M NOT MEXICAN: MISCONCEPTIONS ABOUT HISPANIC AMERICANS
11:00 AM	Kellie Owens, Katelin Friederichs, Britt Hegarty, Kelly Krcmarik, Benjamin Morris	ETHICAL ISSUES IN UMBILICAL CORD BLOOD COLLECTION
11:15 AM	Rebecca Budde, Barbra Elenbaas	A SENSE OF PLACE

Humanities-Group 2

1:00 PM	Rachael Hodder	LIVIN THE MACLIFE: A STUDY IN REBRANDING
1:15 PM	Kelesha Baber	HAND AND CIRCLE GAMES: BLACK FEMALES AND SELF-ESTEEM
1:30 PM	Mark Piskorowski	THE ATHENIAN EPHEBEIA IN PLATOS MENEXENUS
1:45 PM	Brandi Bridges	BLACK LABOR WHITE WEALTH: THE BLACK MALE ATHLETES QUEST TO FIND HIS OWN
2:00 PM	Princess Souvenir	THE TWO ARE REALLY ONE: THE SOCIAL AND POLITICAL IMPACT OF REGGAE AND HIP HOP MUSIC TO NEW WORLD AFRICANS
2:15 PM	Lauren Steffy	THE EFFECT OF MUSICAL STYLE ON THE THRESHOLDS FOR PERCEIVING TEMPO MODULATION
2:30 PM	Sayako Fujii	THE DIFFERENCES BETWEEN MUSICIANS AND NON-MUSICIANS IN LISTENING TO MUSIC
2:45 PM	Nathaniel Bliton	MULTIMEDIUM MUSIC COMPOSITION

Lake Superior Room

Digital Media

9:30 AM	Rebecca Hughes	INTERVIEWS WITH INFORMATION GRAPHICS LEGENDS
9:45 AM	Frank Geist Cory Garcia, Tyler Tagami	BRIEF: THE STORY OF BLOODBOIL
10:00 AM	Cory Garcia, Tyler Tagami	EL SEEDO DARKO
10:15 AM	Frank Geist	GOTH-AM CITY 2
10:30 AM	David Cooper	THE SHOW- EPISODE 63: HOBOS LOVE HOT CHOCOLATE
10:45 AM	James Semivan	W.A.S.T.E
11:00 AM	Evan Heiss, Anthony Siciliano	SIDESHOW
11:15 AM	Carl Kondrat	KEEPING THE FUTURE BRIGHT: THE GREAT LAKES REGION
11:30 AM	Evan Heiss, Mike McLaughlin, Alex Priebe, Brian Wood	ARTS OR CRAFTS
11:45 AM	Svetlana Rivkina	MSUU
12:00 PM	Kyle Haan	WE'RE IN THIS TOGETHER

Agriculture and Environmental Studies—Group 3

1:00 PM	Kevin Mazor, Christine Kostesich, Kristin Merony	DETERMINING THE AMMONIA EMISSION RATE OF EQUIDS DUE TO FEED PROTEIN CONTENT
1:15 PM	Elizabeth St. James	THE EFFECTS OF WOODLOT SIZE AND HABITAT ON THE NUMBER OF BIRD SPECIES WITHIN THE WOODLOT
1:30 PM	Amy Hendricks	ANALYSIS OF THE EFFECTS OF SUBSTITUTION OF SORGHUM AND CASSAVA IN BREAD PRODUCTION
1:45 PM	Steven Couch	BIOTECHNOLOGY COMMUNICATION AND OUTREACH STUDY IN SOUTH AFRICA
2:00 PM	Patrick Foth	CHARACTERIZING AMINO ACID TRANSPORT ACROSS THE EQUINE GASTROINTESTINAL TRACT
2:15 PM	Adrienne Lagrou	VISUALIZING THE CHANGING FOOD SYSTEM
2:30 PM	Rebecca Busk, Aubrey Higginbotham, Michelle Slavin, Ashley Varga	RAPID DETECTION OF E. COLI IN RECREATIONAL WATERS

Tower Room

Business

9:30 AM	Ashley Payton	A META-ANALYTIC REVIEW OF THE ROLE OF FIRM STRATEGIC ORIENTATIONS ON FIRM PERFORMANCE
9:45 AM	Nicole Poppe, Lisa Devereaux	CUSTOMER RELATIONSHIP MANAGEMENT SOFTWARE ANALYSIS
10:00 AM	John Thelen	RELATING THE BALANCED SCORECARD TO RESOURCE AND INDUSTRIAL THEORIES
10:15 AM	Lindsey Cohan	THE INFLUENCE OF MORAL PHILOSOPHY ON ETHICAL DECISION MAKING
10:30 AM	Allison Campbell	PUBLIC-PRIVATE PARTNERSHIPS AT THE BASE OF THE PYRAMID: FROM BUZZWORD TO RESULTS
10:45 AM	Stephanie Mills	THE STRUGGLE TO DEVELOP AND PRESERVE THE DUALITY OF STUDENT-ATHLETES
11:00 AM	Roger Ludy	MICHIGAN WASTE MANAGEMENT
11:15 AM	Jared Merlo	ENTREPRENEURS AND THE INSIGHTS THEY PROVIDE

Social Science- General

1:00 PM	Nada Zohdy	MUSLIM AMERICAN IDENTITY
1:15 PM	Yvette Efevbera	ALLAH, ABC AND HIV/AIDS: A COMPARATIVE ANALYSIS OF THE ROLE OF RELIGION IN UGANDA AND SENEGAL
1:30 PM	Erin Seavoy, Jennifer Copus, Erik Jonasson	RECYCLING IN MICHIGAN
1:45 PM	Jeffrey Astrein	AMERICAN INDIAN POVERTY
2:00 PM	Whittney Brandon	DELAY OF GAME: THE LACK OF BLACK REPRESENTATION IN LEADERSHIP IN COLLEGE FOOTBALL
2:30 PM	Teresa Brown, Benjamin Arbitter, Hannah Bach	KNOWLEDGE AND OPINIONS CONCERNING INTERNATIONAL AFFAIRS
2:45 PM	Nathan Sanders	EXCAVATION OF HISTORIC M.A.C. FACULTY ROW HOUSING COMPLEX
3:00 PM	Haritha Reddy, Kurt Bjorkman, Ryan Heinhuis, Jinweon Won	ORGAN DONATION: A COMPARATIVE STUDY

Poster Presentations

All poster presentations will be displayed in the Ballroom and Sun Porch.

Morning Poster Displays By General Category 9:30 AM – 11:30 AM	Afternoon Poster Displays By General Category 1:30 PM – 3:30 PM
Cell & Molecular Biology	Agriculture & Environmental Science-1
Engineering-1	Agriculture & Environmental Science-2
Engineering -2	Agriculture & Environmental Science-3
Health & Wellness	Biochemistry -1
Humanities/Performing & Visual Arts	Biochemistry- 2
Microbiology -1	Communication Arts & Sciences -1
Microbiology- 2	Communication Arts & Sciences -2
Physical Science- 1	Education
Physical Science- 2	Genetics
Social Science: General	Neuroscience
Social Science: Psychology -1	Social Science: History, Economics, & Political Science
Social Science: Psychology -2	

Poster Presentation Index

The students presenting posters are listed alphabetically by last name.

Poster #	Presenter's Name	Project Title	Time
403	Michael Ackerson	STRATIGRAPHIC HISTORY AND GEOCHEMICAL ANALYSIS OF TRIASSICJURASSIC VOLCANIC ROCKS IN THE ALASKA RANGE, SOUTH CENTRAL ALASKA	9:30 AM
332	Carmen Affonso	ENDOTHELIN 1 DOWNREGULATES NOREPINEPHRINE TRANSPORTER VIA ENDOTHELIN B RECEPTORS	1:30 PM
159	Wesam Agha	JURY PREDELIBERATION DISCUSSION IN CIVIL TRIALS	9:30 AM
106	Zakir Ahammad	REGULATION OF ACE2 GENE EXPRESSION BY THE ANGIOTENSINS	1:30 PM
328	Nicole Albrecht	GUIDE RNA TARGETING IN KINETOPLASTID RNA EDITING	9:30 AM
110	Dua Aldasouqi	MOST EFFICIENT BAKING MATERIAL	1:30 PM
159	Megan Almendinger	JURY PREDELIBERATION DISCUSSION IN CIVIL TRIALS	9:30 AM
301	Chike Anadumaka	DIOXYGENASE GENE DIVERSITY	9:30 AM
159	Whitney Anderson	JURY PREDELIBERATION DISCUSSION IN CIVIL TRIALS	9:30 AM
262	Hamood Arham	ELECTRON SPIN MEMORY LENGTH IN PD NI ALLOY	9:30 AM
226	Natsumi Asanuma	UNIVERSITY STUDENTS GENDER STEREOTYPES ATTRIBUTED TO JAZZ PIANO MUSIC	9:30 AM
68	Laura Aughton	HIGH SCHOOL BULLIES	9:30 AM
299	Allison Austin	COMMUNITY BASED RESEARCH FOR MEDICALLY UNDERSERVED WOMEN	9:30 AM

Poster #	Presenter's Name	Project Title	Time
417	Kareem Baig	BEES AND THEIR EFFECT ON POLLINATION	1:30 PM
194	Nicole Baker	PPR PROTEINS OF TRYPANOSOMA BRUCEI: CLONING, EXPRESSION, AND CRYSTALLIZATION	1:30 PM
114	Brian Bandemer	PHANTOM SMOKING	1:30 PM
220	Marci Baranski	BIOCHEMICAL CHARACTERIZATION OF THE ESSENTIAL GTPASE RBGA	1:30 PM
179	Megan Barry	GENETIC BASIS FOR VITAMIN B12 MALABSORPTION IN HUNGARIAN KOMONDORS	1:30 PM
287	Alan Bart	CUTTING RED TAPE OR PLAYING FAVORITES A COMPARISON OF BUSINESS DEVELOPMENT PNESTOP SHOPS IN THE GREAT LAKES ECONOMIC REGION	1:30 PM
167	Adam Bates	CHARACTERIZATION OF PAP AND FOC FIMBRIAL GENE EXPRESSION IN UROPATHOGENIC E COLI USING LUX REPORTER SYSTEM	9:30 AM
367	Darius Beasley	DEFINITENESS AND INDEFINITENESS IN CHILDRENS INTERPRETATION OF VERBAL ASPECT	9:30 AM
169	Jacob Bell	EXPLORING SNAP BRACELETS WITH SEM	9:30 AM
81	Dayna Benoit	COMPARISON OF TOOTH STRUCTURES	9:30 AM
358	Dana Benson	ENERGY CONSUMPTION IN RESIDENCE HALLS	1:30 PM
310	Michael Berkowitz	RELATIONSHIP BETWEEN KNOWLEDGE OF INTERNATIONAL AFFAIRS AND SOURCE OF INFORMATION	9:30 AM
180	Chelsea Bickerstaff	IMPACT OF EQUINE NUTRITION PRACTICES ON THE ENVIRONMENT AND ECONOMICS	1:30 PM
307	Allison Blaine	A SEARCH FOR NOVEL MUTATIONS CONFERRING SPECTINOMYCIN RESISTANCE IN CHLAMYDOMONAS REINHARDTII	9:30 AM
392	Lauren Blair	ELECTRON BACKSCATTER DIFFRACTION OF METALLIC ALLOYS STUDIES	9:30 AM
412	Bryan Blase	CAN BRAIN FUNCTIONAL MRI MEASURE CENTRAL DRIVE DURING MUSCLE CONTRACTIONS	1:30 PM
103	Kelly Borycki	THE EFFECTS OF EMOTICONS ON INTERPERSONAL EVALUATIONS OF THEIR USERS	1:30 PM
421	Alicia Boyers	FACEBOOK @ MSU: FACULTY USAGE AND ATTITUDES	9:30 AM
415	Clayton Boylan	MOBILE CONTENT SERVICES: A CASE OF OAKLAND COUNTYS EGOVERNMENT	1:30 PM
192	Christopher Bradley	BIODIVERSITY WITHIN PSYCHROBACTER SPP	9:30 AM
414	Amy Brandt	HOSTILE CAMPUSES: THE IMPACT OF SEXUAL HARASSMENT AND INCIVILITY ON THE PSYCHOLOGICAL WELLBEING OF COLLEGE STUDENTS	9:30 AM
241	Trevor Briggeman	GENE SILENCING OF ALC AND IND IN RICE	9:30 AM
236	Emily Brockschmidt	AN ANALYSIS OF HEALTH COMMUNICATION RESEARCH: IS HEARING LOSS ACCOUNTED FOR?	1:30 PM
340	Emily Brooks	COMMUNITY HEALTH WORKERS IMPACT ON CANCER EDUCATION	1:30 PM
299	Lauren Brown	COMMUNITY BASED RESEARCH FOR MEDICALLY UNDERSERVED WOMEN	9:30 AM
350	Sarah Browning	FUNCTIONAL ANATOMY OF READING STORIES VERSUS SOLVING MATH PROBLEMS USING FMRI	1:30 PM

Poster #	Presenter's Name	Project Title	Time
275	Amanda Brune	EARLY ADOLESCENT POSITIVE AFFECT AND YOUNG ADULT HEALTH OUTCOMES	9:30 AM
207	Jason Brunton	CONSERVATION OF TRYPTOPHAN REPRESSOR:DNA OPERATOR COMPLEXES	1:30 PM
82	Jason Brunton	FACEBOOK @ MSU: STUDENT ATTITUDES AND USAGE	9:30 AM
391	Sara Buccilli	MUSIC THERAPY INFLUENCES IN AREAS OF SOCIAL AND COMMUNICATION IN AN ADULT WITH FRAGILE X SYNDROME	9:30 AM
61	Lauren Bul	CONDUCTOMETRIC DETECTION OF ESCHERICHIA COLI 0157:H7	1:30 PM
290	Cameron Burns	INVESTIGATING MICROORGANISMS AS A FOOD SOURCE FOR MOSQUITO LARVAE	9:30 AM
359	Meg Callahan	P33 AND ITS IMPORTANCE TO BACULOVIRUS INFECTIONS	9:30 AM
334	Aimee Campbell	THE EFFECT OF GLUCOSAMINE AND CHONDROITIN SULFATE ON PORCINE CARTILAGE	1:30 PM
358	Laura Canever	ENERGY CONSUMPTION IN RESIDENCE HALLS	1:30 PM
310	Gillian Cann	RELATIONSHIP BETWEEN KNOWLEDGE OF INTERNATIONAL AFFAIRS AND SOURCE OF INFORMATION	9:30 AM
331	David James Carr	HIGHLY AMPLIFIED BIOBARCODE DNA BIOSENSOR FOR THE DETECTION OF SALMONELLA ENTERITIDIS	9:30 AM
306	Brian Castro	APTAMER SELECTION FOR MICROORGANISM DETECTION PRELIMINARY ASSAYS	9:30 AM
394	Susan Cavicchioli	REDUCING BOTTLED WATER WASTE	1:30 PM
385	Christian Chagas	THE ROLE OF THE INSULIN SIGNALING PATHWAY IN ORGAN GROWTH AND SIZE REGULATION	1:30 PM
281	Lucan Chatterley	CREATING A WEB BASED TUTORIAL FOR COMMUNITY HEALTH WORKERS	1:30 PM
372	Ali Chehab	SECOND LIFES INFLUENCE ON USER INTENTION FOR EGOVERNMENT SERVICES IN CONTRAST TO 2D WEBSITES	1:30 PM
196	Ali Chehab	HOW DIFFERENT INTERFACES EFFECT CONSUMER PURCHASING INTENTIONS	1:30 PM
281	Dae Choi	CREATING A WEB BASED TUTORIAL FOR COMMUNITY HEALTH WORKERS	1:30 PM
159	Caitlin Cipri	JURY PREDELIBERATION DISCUSSION IN CIVIL TRIALS	9:30 AM
124	Tara Clark	DUBLIN AND BOSTON: CITIES OF SUCCESSFUL CIVIL ASSOCIATIONS	1:30 PM
180	Andrea Cohen	IMPACT OF EQUINE NUTRITION PRACTICES ON THE ENVIRONMENT AND ECONOMICS	1:30 PM
93	Ardian Coku	THE ROLE OF A NOVEL DNAJLIKE PROTEIN IN FATTY ACID METABOLISM	1:30 PM
325	Kara Constantine	RESILIENCE WITHIN HEAD START PRESCHOOLERS: PREVALENCE OF DECA PROTECTIVE	1:30 PM
344	Rebecca Cotter	EVOLUTION OF BACTERIAL CHROMOSOME SIZE	9:30 AM
219	Shawna Couture	JUICY CAMPUS	1:30 PM
239	Megan Curtis	NEW DIGITAL DEVICES AND ACADEMIC WORK	1:30 PM
394	Katie Daenzer	REDUCING BOTTLED WATER WASTE	1:30 PM
273	John Darling	GREEN ROOF COST BENEFIT ANALYSIS	1:30 PM

Poster #	Presenter's Name	Project Title	Time
372	Sarah Deighan	SECOND LIFES INFLUENCE ON USER INTENTION FOR EGOVERNMENT SERVICES IN CONTRAST TO 2D WEBSITES	1:30 PM
379	Sarah Deighan	COMPARISON OF THE DIFFERENCES BETWEEN 2D AND 3D FOR DIFFERENT AGE GROUPS	1:30 PM
386	Nader Delavari	NADER SHAHS RELIGIOUS REFORMS: INSIGHT TO CONTEMPORARY POLITICAL ISLAM	1:30 PM
136	William DePas	CONSTRUCTION OF AN IMPROVED ADENOVIRUS BASED VACCINE BY EXPRESSION OF AN EIMERIA SPP DERIVED PROTEIN	9:30 AM
282	Karl DeVries	IMPACTS OF BOTTLED WATER USE BY STUDENTS ON THE MICHIGAN STATE UNIVERSITY CAMPUS AND PROMOTION OF AVAILABLE ALTERNATIVES	1:30 PM
340	Monika Dietrich	COMMUNITY HEALTH WORKERS IMPACT ON CANCER EDUCATION	1:30 PM
366	Thao Dinh	CHILDREN'S USE OF PROSODY TO DETERMINE SYNTACTIC STRUCTURE	9:30 AM
368	Thao Dinh	CHILDREN'S COMPREHENSION OF THE FUTURE	9:30 AM
273	Emma Distel	GREEN ROOF COST BENEFIT ANALYSIS	1:30 PM
410	Susan D'Mello	FACTORS INFLUENCING THE LIKELIHOOD OF OBSERVER INTERVENTION IN INCIDENTS OF WORKPLACE HARASSMENT OF EMPLOYEES WITH DISABILITIES	9:30 AM
239	Kathleen Dobruse	NEW DIGITAL DEVICES AND ACADEMIC WORK	1:30 PM
197	Ella Dolan	AREAS OF GEOGRAPHIC RACIAL EQUALITY BETWEEN HISPANICS AND NONHISPANIC WHITES IN TEXAS	9:30 AM
174	John Dover	INVESTIGATING GENOME SIZE REDUCTION BY EXPERIMENTAL EVOLUTION WITH ESCHERICHIA COLI	9:30 AM
239	Greg Dowdy	NEW DIGITAL DEVICES AND ACADEMIC WORK	1:30 PM
133	Sarah Drake	IS NONDIET ONLINE INTERVENTION FOR WEIGHT MANAGEMENT IN COLLEGE STUDENTS EFFECTIVE	9:30 AM
385	Michael Driscoll	THE ROLE OF THE INSULIN SIGNALING PATHWAY IN ORGAN GROWTH AND SIZE REGULATION	1:30 PM
96	Emily Dworkin	CHILDHOOD SEXUAL ABUSE AND DELIBERATE SELF HARM: PREDICTIVE RELATIONSHIPS AND MENTAL HEALTH OUTCOMES	9:30 AM
183	Jeffery Edmonds	EARLY MORNINGS, LATE AFTERNOONS	1:30 PM
360	Alyse Egner	BIOGAS POTENTIAL SCREENING USING ANAEROBIC RESPIROMETRY	9:30 AM
204	Laurel Eibach	COMPARISON OF CARBONACEOUS CHONDRITE METEORITES TO RESULTS FROM THE STARDUST MISSION	9:30 AM
398	Mohammad Esfahanian	ANALYSIS OF CARDIAC NOREPINEPHRINE (NE) TRANSPORTER (NET) MRNA AFTER REMOVAL OF THE STELLATE GANGLIA	9:30 AM
122	Adrienne Niku Falandino	DIMINISHED MNSOD CONTRIBUTES TO ENDOTHELIAL PROGENITOR CELL DYSFUNCTION, IMPAIRED ANGIOGENESIS AND WOUND HEALING IN TYPE 2 DIABETES	9:30 AM
308	Danielle Fasseel	GENETIC MAPPING OF A GENE THAT REPRESSES FLOWERING	1:30 PM
350	Dana Ferrari	FUNCTIONAL ANATOMY OF READING STORIES VERSUS SOLVING MATH PROBLEMS USING FMRI	1:30 PM

Poster #	Presenter's Name	Project Title	Time
281	Courtney Fohlbrook	CREATING A WEB BASED TUTORIAL FOR COMMUNITY HEALTH WORKERS	1:30 PM
314	Christopher Fort	OPINION AND FOREIGN AFFAIRS KNOWLEDGE	1:30 PM
286	Bruce Fraser	A FUSION PROTEIN OF MALTOSE BINDING PROTEIN AND URED, AN ACCESSORY PROTEIN INVOLVED IN UREASE ACTIVATION	9:30 AM
185	Robert Friederichs	BIOCOMPATIBILITY OF AMORPHOUS DIAMOND LIKE CARBON COATED TI AND COCRMO IMPLANTS	9:30 AM
201	Shannon Friedgen	IDENTIFYING BARRIERS AND IMPROVING NUTRITION SCREENING AND COUNSELING IN CHILDRENS WELL CHILD VISITS	9:30 AM
401	Mark Gaynor	EXPRESSION AND PURIFICATION OF PSEUDOMONAS SYRINGAE HOLPTOY	9:30 AM
221	Amelia Gessner	GEOGRAPHIC RACIAL EQUALITY BETWEEN WHITES AND ASIANS IN METROPOLITAN DETROIT	9:30 AM
299	Lizabeth Giles	COMMUNITY BASED RESEARCH FOR MEDICALLY UNDERSERVED WOMEN	9:30 AM
201	Rachele Gillengerten	IDENTIFYING BARRIERS AND IMPROVING NUTRITION SCREENING AND COUNSELING IN CHILDRENS WELL CHILD VISITS	9:30 AM
95	Kevin Gipson	INTRAMOLECULAR ASYMMETRIC HYDROAMINATION OF AMINOALKENES	9:30 AM
416	Calvin Glaspie	DEVELOPMENT OF AN EARLY GENERATION TEST FOR COMMON SCAB OF POTATO USING HYDROPONIC NUTRIENT FILM TECHNOLOGY	1:30 PM
342	Nicole Goldman	TEXTURAL ANALYSIS OF COOKIES WITH INCREASING PERCENTAGES OF CRANBERRY BEAN FLOUR	9:30 AM
189	Katherine Gonzales	THE ROLE OF TLR4 IN OZONE-INDUCED LUNG INFLAMMATION	1:30 PM
165	Ramy Goueli	THE ROLE OF THE SMALL GTPASE, CDC 42, IN THE ACTIVATION OF MIXED LINEAGE KINASE 3 THROUGH ITS INTERACTION WITH THE CDC42/RAC INTERACTIVE BINDING MOTIF	1:30 PM
375	Keara Grady	INVESTIGATING POSSIBLE MOLECULAR MECHANISMS FOR THE REGULATION OF ANGII AND ITS ROLE IN IDIOPATHIC PULMONARY FIBROSIS	9:30 AM
103	Sarah Greenberg	THE EFFECTS OF EMOTICONS ON INTERPERSONAL EVALUATIONS OF THEIR USERS	1:30 PM
354	David Grindem	PURIFICATION AND CRYSTALLIZATION OF THE NEISSERIA GONORRHEAE PROTEIN NG1684	1:30 PM
329	Amy Gruber	GENE HUNTING TO LOCATE GENETIC MUTATIONS LEADING TO CANINE PROGRESSIVE RETINAL ATROPHY	1:30 PM
309	Alex Grushky	HOW THE HUMAN EYE PROTEINS PHYSIOLOGICALY DIFFERENTIATE DIFFERENT WAVELENGTHS OF LIGHT	1:30 PM
180	Colleen Guidot	IMPACT OF EQUINE NUTRITION PRACTICES ON THE ENVIRONMENT AND ECONOMICS	1:30 PM
384	Brittany Gunther	EVOLUTION OF INVASIVE SPECIES IN THE GREAT LAKES	1:30 PM
63	Danielle Habitz	THE EFFECTS PACKAGING AND STORAGE LIFE HAVE ON THE ANTIOXIDANT CAPACITY OF MICHIGAN GROWN ASPARAGUS	1:30 PM
281	Elyse Hahn	CREATING A WEB BASED TUTORIAL FOR COMMUNITY HEALTH WORKERS	1:30 PM
282	Lindsay Hatter	IMPACTS OF BOTTLED WATER USE BY STUDENTS ON THE MICHIGAN STATE UNIVERSITY CAMPUS AND PROMOTION OF AVAILABLE ALTERNATIVES	1:30 PM

Poster #	Presenter's Name	Project Title	Time
209	Sara Hawes	LADYBUGS	9:30 AM
112	Lauren Hayes	GEOGRAPHIC RACIAL EQUALITY IN KENTUCKY	9:30 AM
340	Aisha Henderson	COMMUNITY HEALTH WORKERS IMPACT ON CANCER EDUCATION	1:30 PM
244	Ryan Hendricks	TIME-RESOLVED PHOSPHORESCENCE DETECTION OF PROTEIN DYNAMICS	9:30 AM
419	Alex B. Hill	CHEVRON'S TRIPARTITE RELATIONSHIP WITH NIGERIA'S FEDERAL STAKEHOLDERS	1:30 PM
314	Michele Hillman	OPINION AND FOREIGN AFFAIRS KNOWLEDGE	1:30 PM
368	Marie Hollenbeck	CHILDREN'S COMPREHENSION OF THE FUTURE	9:30 AM
351	Christine Honer	CAN PERCEPTIONS LEAD TO PURCHASE	1:30 PM
348	Christine Honer	META ANALYSIS OF HUMANCOMPUTER INTERACTION RESEARCH	1:30 PM
250	Chelsea House	A STITCH AHEAD: EXAMINING THE PROPERTIES OF ETHICON, INC. SUTURES USING SCANNING ELECTRON MICROSCOPY	9:30 AM
193	Matthew Hull	THE INTEGRATION OF NATURE INTO DESIGN	1:30 PM
259	No-Ya Hung	THE IMPACT OF 1-METHYLCYCLOPROPENE (1-MCP) ON ETHYLENE INVOLVED GENE EXPRESSION IN APPLE	1:30 PM
299	Netali Ish-Hurwitz	COMMUNITY BASED RESEARCH FOR MEDICALLY UNDERSERVED WOMEN	9:30 AM
358	Becca Jaskot	ENERGY CONSUMPTION IN RESIDENCE HALLS	1:30 PM
126	Michael Jeffery	ROCKETBALL	1:30 PM
281	Anna Johnson	CREATING A WEB BASED TUTORIAL FOR COMMUNITY HEALTH WORKERS	1:30 PM
421	Ashley Jurkovich	FACEBOOK @ MSU: FACULTY USAGE AND ATTITUDES	9:30 AM
132	Rachel Kamish	COMPOSITION OF SEASHELLS	9:30 AM
234	Karla Kapplinger	STUDY OF HOUSEHOLD PLANT LEAF STRUCTURE USING SCANNING ELECTRON MICROSCOPY	1:30 PM
312	Beiser Katie	DISTRIBUTION OF RUST IN CARBONACEOUS CHONDRITE, AND IMPLICATIONS FOR DIFFERENTIAL PERMEABILITY OF MATRIX, RIM AND CLAST MATERIALS ON THE CM CHONDRITE PARENT BODY	9:30 AM
131	Amanda Keedle	SEA SHELL STRUCTURE AND ELEMENTAL COMPOSITION	9:30 AM
293	Chong Kim	SCORING FUNCTION: ASSESSMENT MEASURE FOR PROTEIN-PROTEIN DOCKING	1:30 PM
282	Johanna Kinsler	IMPACTS OF BOTTLED WATER USE BY STUDENTS ON THE MICHIGAN STATE UNIVERSITY CAMPUS AND PROMOTION OF AVAILABLE ALTERNATIVES	1:30 PM
40	Edita Klimyte	MOLECULAR SYSTEMATICS OF THE BUTTERFLY GENUS SPEYERIA	9:30 AM
291	Douglas Kline	CHARACTERIZATION OF THRESHOLD DEPENDENT ACTIVATION OF B LYMPHOCYTES BY LIPOPOLYSACCHARIDE AND ITS ROLE IN IMPAIRMENT OF THE IGM RESPONSE BY 2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	9:30 AM
103	Christine Knasel	THE EFFECTS OF EMOTICONS ON INTERPERSONAL EVALUATIONS OF THEIR USERS	1:30 PM
210	Kyle Korolowicz	ANALYSIS OF ARABIDOPSIS THALIANA NUCLEOTIDESUGAR NETWORKS, IMPLICATIONS IN CELL WALL BIOSYNTHESIS AND REGULATION	9:30 AM

Poster #	Presenter's Name	Project Title	Time
237	Christine Kostesich	AFFECT OF PROTEIN ON AMMONIA EMISSIONS IN VITRO	1:30 PM
287	Laura Kovacek	CUTTING RED TAPE OR PLAYING FAVORITES A COMPARISON OF BUSINESS DEVELOPMENT PNESTOP SHOPS IN THE GREAT LAKES ECONOMIC REGION	1:30 PM
42	Andrew Krieger	A COLLABORATIVE MODELING APPROACH FOR COMPLEX BUFFERS AND THEIR PROPERTIES	1:30 PM
206	Srikanth Kumar	FIRE PROBLEM IN THE UNITED STATES	9:30 AM
385	Mania Kupershtok	THE ROLE OF THE INSULIN SIGNALING PATHWAY IN ORGAN GROWTH AND SIZE REGULATION	1:30 PM
45	Jeffrey LaForge	THERMAL FOOT	9:30 AM
73	Carolyn LaPlante	STUDENT GENERATED PROTECTIVE BEHAVIORS TO AVERT SEVERE HARMS CAUSED BY ALCOHOL CONSUMPTION	1:30 PM
288	Jacqueline Lapp	THE ROLE OF JUMONJIC DOMAIN CONTAINING PROTEINS IN TRANSCRIPTION AND CHROMATIN MODIFICATION	9:30 AM
376	Lawrence Lee	GENOTYPING ANALYSIS OF TPH2 AND DDC SNPS IN DOG BREEDS EXHIBITING A VARIETY OF BEHAVIORS	1:30 PM
257	Jun-seok Lee	REGULATION OF 4403 PROMOTER IN MYXOCOCCUS XANTHS	1:30 PM
406	Debrah Lee	GOVERNMENT RECEPTIVENESS TO DEMANDS FOR SANITATION IN RURAL BANGLADESH	9:30 AM
316	Alicia Levere	THE EFFECT OF DEMOGRAPHICS AND ACADEMIC BACKGROUND ON KNOWLEDGE OF INTERNATIONAL AFFAIRS	1:30 PM
161	Lauren Liddell	COMPLEMENTATION OF CJ1419C IN CAMPYLOBACTER JEJUNI NCTC 11168	9:30 AM
249	Alexander Lindsey	EFFECT OF SOIL TYPE ON ROOT DEVELOPMENT OF PINUS PONDEROSA VAR SCOPULORUM UNDER DROUGHT CONDITIONS	1:30 PM
85	Amanda Lorenz	INTERACTIONS OCCUR BETWEEN AUTOCHTHONOUS AND ALLOCHTHONOUS PROCESSES IN A HEADWATER STREAM	1:30 PM
70	Jessica Lowry	INNOCENT BYSTANDERS	9:30 AM
175	Paul Luethy	ENGINEERING A CYSTEINE-LESS SPOIVFB	1:30 PM
309	Michael Lundin	HOW THE HUMAN EYE PROTEINS PHYSIOLOGICALY DIFFERENTIATE DIFFERENT WAVELENGTHS OF LIGHT	1:30 PM
347	Joshua Mackaluso	ANALYZING THE EVOLUTIONARY RATES OF INTRACELLULAR AND EXTRACELLULAR PROTEINS	1:30 PM
245	William Martinez	ELECTRIC PROPERTIES OF GRAPHENE	9:30 AM
73	Alex Mayer	STUDENT GENERATED PROTECTIVE BEHAVIORS TO AVERT SEVERE HARMS CAUSED BY ALCOHOL CONSUMPTION	1:30 PM
304	Ryan Mayle	CHLOROPLAST DNA MUTATIONS AS A GENETIC INDICATOR OF OXIDATIVE DAMAGE IN CHLAMYDOMONAS REINHARDTII	1:30 PM
180	Kevin Mazor	IMPACT OF EQUINE NUTRITION PRACTICES ON THE ENVIRONMENT AND ECONOMICS	1:30 PM
300	Ashley McCarthy	PATTERN RECOGNITION AND DISCRIMINATION IN HORSES	1:30 PM
412	Robert McClowry	CAN BRAIN FUNCTIONAL MRI MEASURE CENTRAL DRIVE DURING MUSCLE CONTRACTIONS	1:30 PM

Poster #	Presenter's Name	Project Title	Time
74	Victoria McCoy	A NEW ICHNOSPECIES OF ARTHROPHYCUS FROM THE LATE CARBONIFEROUS (PENNSYLVANIAN) OF MICHIGAN, USA	9:30 AM
218	Erin McCue	LEAD SARCOPHAGUS	9:30 AM
340	Casey McLean	COMMUNITY HEALTH WORKERS IMPACT ON CANCER EDUCATION	1:30 PM
224	Megan McNally	HISTORIC INTERIORS OF MICHIGAN STATE UNIVERSITY BUILDINGS	9:30 AM
38	Krish Mehta	ALTERNATIVE MEDICINE AND AMERICAN DOCTORS	9:30 AM
312	Michael Mendoza	DISTRIBUTION OF RUST IN CARBONACEOUS CHONDRITE, AND IMPLICATIONS FOR DIFFERENTIAL PERMEABILITY OF MATRIX, RIM AND CLAST MATERIALS ON THE CM CHONDRITE PARENT BODY	9:30 AM
270	Hanna Miller	SYNTHESIS AND EVALUATION OF ELECTRICALLY ACTIVE MAGNETIC NANO AND MICRO PARTICLES FOR BIOSENSING OF BOVINE VIRAL DIARRHEA VIRUS	9:30 AM
70	Erik Mitchell	INNOCENT BYSTANDERS	9:30 AM
374	Michael Moran	DEPLETION OF SULFUR WITHIN STARDUST SAMPLES AND ITS IMPLICATIONS ON UNDERSTANDING EXTRATERRESTRIAL BODIES	9:30 AM
356	Meredith Morgan	PRODUCT TYPE AND ONLINE INITIAL TRUST ANTECEDENTS	1:30 PM
348	Meredith Morgan	META-ANALYSIS OF HUMAN-COMPUTER INTERACTION RESEARCH	1:30 PM
340	Shimaa Mousa	COMMUNITY HEALTH WORKERS IMPACT ON CANCER EDUCATION	1:30 PM
223	Abbey Mullen	THE EFFECTS OF CHITINASE AND CATHEPSON ON MEMBRANE PROTEIN PRODUCTION IN ACMNPV	9:30 AM
82	Kaitlynn Murphy	FACEBOOK @ MSU: STUDENT ATTITUDES AND USAGE	9:30 AM
159	Matthew Murray	JURY PREDELIBERATION DISCUSSION IN CIVIL TRIALS	9:30 AM
378	Matthew Murray	THE BARBARY WAR: PERCEPTIONS OF MUSLIMS AND THE INTERNATIONAL SYSTEM	1:30 PM
108	Daniel Myers	LAKE MODELING FOR CONSERVATION IN THE PERUVIAN AMAZON	1:30 PM
163	Khalil Nasser	ENHANCE SHOPPING EXPERIENCE WITH PERSONALIZED GUIDED TOURS	1:30 PM
372	Khalil Nasser	SECOND LIFES INFLUENCE ON USER INTENTION FOR EGOVERNMENT SERVICES IN CONTRAST TO 2D WEBSITES	1:30 PM
154	Michaelene Novak	COMMUNICATION IN THE APPAREL AND TEXTILE INDUSTRY	1:30 PM
358	Martha Nowicki	ENERGY CONSUMPTION IN RESIDENCE HALLS	1:30 PM
355	Diana Obradovich	RESEARCH ASSISTANT AND COORDINATOR FOR ARTS MARATHON WEEKEND	9:30 AM
159	Kelly O'Connell	JURY PREDELIBERATION DISCUSSION IN CIVIL TRIALS	9:30 AM
239	Michael Ogilvie	NEW DIGITAL DEVICES AND ACADEMIC WORK	1:30 PM
402	Derek O'Leary	METAPHORS IN CREATIVITY	1:30 PM
412	Michael Oliverio	CAN BRAIN FUNCTIONAL MRI MEASURE CENTRAL DRIVE DURING MUSCLE CONTRACTIONS	1:30 PM
294	Mark O'Neall	LOOKING ON THE BRIGHT SIDE: WHERE IN METROPOLITAN DETROIT HAS A MINORITY GROUP REACHED GEOGRAPHIC RACIAL EQUALITY	9:30 AM

Poster #	Presenter's Name	Project Title	Time
338	Priyanka Pandey	EVALUATING HEIRLOOM TOMATO VARIETIES FOR THE PRESENCE OF THE GREEN FLESH MUTATION	1:30 PM
118	Andrew Para	DROSOPHILA MELANOGASTER	9:30 AM
100	Varun Paranjpe	YOUTH BULLYING: THE VICTIMIZATION	9:30 AM
82	Nirali Patel	FACEBOOK @ MSU: STUDENT ATTITUDES AND USAGE	9:30 AM
68	Jacob Peacock	HIGH SCHOOL BULLIES	9:30 AM
57	Jade Pearce	COLLEGE STUDENT VIEWPOINTS ON NATURAL AND ARTIFICIAL MATERIALS	9:30 AM
417	Jon Petersen	BEES AND THEIR EFFECT ON POLLINATION	1:30 PM
103	Leif Peterson	THE EFFECTS OF EMOTICONS ON INTERPERSONAL EVALUATIONS OF THEIR USERS	1:30 PM
316	Kelly Phelan	THE EFFECT OF DEMOGRAPHICS AND ACADEMIC BACKGROUND ON KNOWLEDGE OF INTERNATIONAL AFFAIRS	1:30 PM
75	Ben Phillips	OPPORTUNITIES FOR ALTERNATIVE ENERGY EDUCATION IN MICHIGAN SCHOOLS K-12 COMPARED TO NATIONAL AND INTERNATIONAL STANDARDS	1:30 PM
400	Alexander Plum	MILITARY AUTHORITARIANIS: CONSTITUTIONAL DEMOCRACY IN THAILAND	1:30 PM
265	Margaret Powers	THE MEDIATING ROLE OF TRUST ON THE CREDIBILITY OF ONLINE RETAILERS AND CONSUMERS PURCHASE INTENTIONS	1:30 PM
372	Margaret Powers	SECOND LIFES INFLUENCE ON USER INTENTION FOR EGOVERNMENT SERVICES IN CONTRAST TO 2D WEBSITES	1:30 PM
412	Zach Punch	CAN BRAIN FUNCTIONAL MRI MEASURE CENTRAL DRIVE DURING MUSCLE CONTRACTIONS	1:30 PM
371	Katherine Rabidoux	PERIOD CHANGES OF TYPE II CEPHEID VARIABLE STARS: WATCHING STARS EVOLVE	9:30 AM
240	Romali Ranasinghe	BIOSYNTHESIS OF GOLD NANOPARTICLES	9:30 AM
243	Katherine Rank	A CHEMICAL DERIVATIZATION AND MULTISTAGE TANDEM MASS SPECTROMETRY BASED STRATEGY FOR TARGETED PHOSPHOPROTEOME ANALYSIS	9:30 AM
372	Allison Ribble	SECOND LIFE'S INFLUENCE ON USER INTENTION FOR EGOVERNMENT SERVICES IN CONTRAST TO 2-D WEBSITES	1:30 PM
200	Allison Ribble	AFFECTS OF LEVEL OF INVOLVEMENT IN 3-D ADVERTISING ON PURCHASE INTENTION	1:30 PM
361	Emily Riddell	SEM-ANALYSIS OF DIFFERENT FIBERS AND FORENSIC APPLICATION	9:30 AM
68	Samantha Rinke	HIGH SCHOOL BULLIES	9:30 AM
126	Charles Roman	ROCKETBALL	1:30 PM
92	Christina Russell	HOW DO PARENTS APPROACH QUANTITATIVE BOOKS WITH THEIR PRESCHOOLERS	9:30 AM
273	Brian Ryerkerk	GREEN ROOF COST BENEFIT ANALYSIS	1:30 PM
100	Valerie Rygiel	YOUTH BULLYING: THE VICTIMIZATION	9:30 AM
412	Michelle Sahm	CAN BRAIN FUNCTIONAL MRI MEASURE CENTRAL DRIVE DURING MUSCLE CONTRACTIONS	1:30 PM
126	Bryan Sandford	ROCKETBALL	1:30 PM

Poster #	Presenter's Name	Project Title	Time
66	Lisa Savalli	THE ROLE OF RENEWABLE ENERGY ON COMMUNITY SELF RELIANCE	1:30 PM
100	Erin Scherer	YOUTH BULLYING: THE VICTIMIZATION	9:30 AM
68	Kathleen Scheuber	HIGH SCHOOL BULLIES	9:30 AM
237	Elizabeth Scheuing	AFFECT OF PROTEIN ON AMMONIA EMISSIONS IN VITRO	1:30 PM
350	Mary Schmidt	FUNCTIONAL ANATOMY OF READING STORIES VERSUS SOLVING MATH PROBLEMS USING FMRI	1:30 PM
285	Laura Schroeder	TERRESTRIAL WEATHERING OF EUCRITIC ACHONDRITIC METEORITES	9:30 AM
281	Alycia Sedlacek	CREATING A WEB BASED TUTORIAL FOR COMMUNITY HEALTH WORKERS	1:30 PM
383	Raymond Seese	IMPACT OF IFNG ON BONE LOSS IN DIABETIC MICE	9:30 AM
180	Shaina Selbig	IMPACT OF EQUINE NUTRITION PRACTICES ON THE ENVIRONMENT AND ECONOMICS	1:30 PM
186	Lei Shan	CMEIAS 1X BIOFILM RESEARCH	9:30 AM
343	Jefrey Shaw	INFORMED PARSING	9:30 AM
225	Rachael Short	MUSIC IN WORSHIP	9:30 AM
324	Jennifer Sidge	DO HENS HAVE A COLOR PREFERENCE FOR DUSTBATHING SUBSTRATE	1:30 PM
65	Nicole Smith	THE EFFECT OF MARTINGALE REIN INSERTS ON HORSES BEHAVIOR	1:30 PM
159	Kelsey Smith	JURY PREDELIBERATION DISCUSSION IN CIVIL TRIALS	9:30 AM
345	Ryan Spencer	STRUCTURAL ANALYSIS OF THE INFLUENZA VIRAL FUSION PROTEIN	1:30 PM
390	Kyle Sprague	ADVANTAGES OF MIIPS FOR TWO-PHOTON MICROSCOPY WITH ULTRASHORT PULSES	9:30 AM
91	Brett Staron	DEVELOPMENT AS EMPOWERMENT	1:30 PM
148	Andrea Stavoe	GUN201 ENCODES A TPR PROTEIN OF UNKNOWN FUNCTION AND DEFINES A NEW PLASTIDTONUCLEUS SIGNALING PATHWAY	1:30 PM
323	Benjamin Strong	DETECTION OF FISSION FRAGMENTS OF URANIUM	9:30 AM
346	Rebekah Struck	WEB-BASED SURVEYS	9:30 AM
178	Fernando Suarez de Urbina	EFFECTS OF STREPTOMYCIN IN THE MICROBIAL COMMUNITY	9:30 AM
222	Anjela Sullenger	THE EFFECTS OF RESIDENTIAL DEVELOPMENT ON LAKE FOOD WEB SYSTEMS	1:30 PM
207	Ryan Sullivan	CONSERVATION OF TRYPTOPHAN REPRESSOR:DNA OPERATOR COMPLEXES	1:30 PM
368	Megan M. Sutton	CHILDREN'S COMPREHENSION OF THE FUTURE	9:30 AM
366	Megan M. Sutton	CHILDREN'S USE OF PROSODY TO DETERMINE SYNTACTIC STRUCTURE	9:30 AM
141	Ashley Swartz	RUNNING ECONOMY IN MEN AND WOMEN VARSITY BASKETBALL ATHLETES	9:30 AM
365	Katie Swiderski	GETTING INTERRUPTED: WHY SOME TYPES OF INTERRUPTIONS MAY BE MORE DISRUPTIVE THAN OTHERS	9:30 AM
139	Lauren Taubitz	PREDICTING PERSISTENCE OF ADHD: A MOLECULAR GENETIC STUDY	9:30 AM
242	Allison Taunt	GRAND RAPIDS: A STUDY OF GEOGRAPHIC RACIAL EQUALITY	9:30 AM

Poster #	Presenter's Name	Project Title	Time
273	Caitlin Taylor	GREEN ROOF COST BENEFIT ANALYSIS	1:30 PM
157	Gabrielle Tepp	TIME SCALES OF AQUEOUS ALTERATION ON THE C2 CARBONACEOUS CHONDRITE PARENT BODY	9:30 AM
277	Michaela TerAvest	EFFECTS OF RCAE ON CELL MORPHOLOGY IN FREMYELLA DIPLOSIPHON	1:30 PM
420	Justin Thomas	SYNTHESIS, STRUCTURE, AND MAGNETIC STUDIES OF TRIMETALLIC μ-TERT-BUTYLIMIDE COMPOUNDS	9:30 AM
107	Danielle Thomas	MOOD AND PERSON PERCEPTION: THE IMPORTANCE OF OBSERVER MOOD	9:30 AM
181	Jason Thomas	STRUCTURAL MODELS FOR THE ACTIVE SITE OF ACETYL COENZYME A SYNTHASE	1:30 PM
237	Elizabeth Thome	AFFECT OF PROTEIN ON AMMONIA EMISSIONS IN VITRO	1:30 PM
138	Anna Timmerman	DENSITY DEPENDENT GERMINATION RATES OF THREE SUMMER ANNUAL WEEDS	1:30 PM
282	David Tindle	IMPACTS OF BOTTLED WATER USE BY STUDENTS ON THE MICHIGAN STATE UNIVERSITY CAMPUS AND PROMOTION OF AVAILABLE ALTERNATIVES	1:30 PM
362	Suzanne Towner	HAIR: A COMPARATIVE ANALYSIS ON STRUCTURE AND FUNCTION	9:30 AM
60	Taaja Tucker	CAUSES OF INJURY TO BIRDS BROUGHT TO A SOUTHEASTERN MICHIGAN REHABILITATION CENTER	1:30 PM
352	Grace Tung	TRICHOTHECENE MYCOTOXINS AND THE RIBOTOXIC STRESS RESPONSE	9:30 AM
353	Beverly Twiss	COMPENSATORY EVOLUTION	9:30 AM
366	Andrew Valentine	CHILDREN'S USE OF PROSODY TO DETERMINE SYNTACTIC STRUCTURE	9:30 AM
103	Jessica Valentine	THE EFFECTS OF EMOTICONS ON INTERPERSONAL EVALUATIONS OF THEIR USERS	1:30 PM
364	Andrew Valentine	ASSESSING CHILDREN'S PRODUCTIVE USE OF 'WILL' AND 'GONNA'	9:30 AM
70	Kayla Vallosia	INNOCENT BYSTANDERS	9:30 AM
77	Valerie Vanderkolk	DISCOVERING A GARMENTS HISTORY	9:30 AM
388	Megan VanSickle	DEVELOPMENT OF CANINE SINE INSERTION POLYMORPHIC MARKERS FOR A GENOME SCAN FOR THE CRANIOMANDIBULAR OSTEOPATHY (CMO) DISEASE GENE	1:30 PM
87	Christin Vasilenko	USING DRAMA FOR LITERACY TEACHING IN URBAN SCHOOLS	1:30 PM
103	Amara Vear	THE EFFECTS OF EMOTICONS ON INTERPERSONAL EVALUATIONS OF THEIR USERS	1:30 PM
412	Daniel Veldheer	CAN BRAIN FUNCTIONAL MRI MEASURE CENTRAL DRIVE DURING MUSCLE CONTRACTIONS	1:30 PM
70	Melissa Vermette	INNOCENT BYSTANDERS	9:30 AM
236	Jessica Warnshuis	AN ANALYSIS OF HEALTH COMMUNICATION RESEARCH: IS HEARING LOSS ACCOUNTED FOR?	1:30 PM
201	Courtney Watkins	IDENTIFYING BARRIERS AND IMPROVING NUTRITION SCREENING AND COUNSELING IN CHILDRENS WELL CHILD VISITS	9:30 AM
267	Amy Wechsler	A DECISION-MAKING ALGORITHM FOR MOSQUITO BLOOD MEAL IDENTIFICATION USING PCR AMPLIFICATION OF THE VERTEBRATE CYTOCHROME B GENE	9:30 AM
53	Kayla Weiss	THE PALATABILITY OF FISH OIL FOR HORSES	1:30 PM

Poster #	Presenter's Name	Project Title	Time
421	Nicholas Wendling	FACEBOOK @ MSU: FACULTY USAGE AND ATTITUDES	9:30 AM
232	Trisha Westerhof	MOLECULAR EVIDENCE FOR POSITIVE SELECTION OF THE ANTIFIV GENE APOBEC3C IN CAT SPECIES: A MODEL FOR UNDERSTANDING HOST VS PATHOGEN ARMS RACE OF HUMANS WITH HIV	9:30 AM
103	Daniel Westrick	THE EFFECTS OF EMOTICONS ON INTERPERSONAL EVALUATIONS OF THEIR USERS	1:30 PM
177	Michael Wiederoder	STUDY OF ELECTROSPUN NANOFIBERS FOR USE IN A CONDUCTOMETRIC BIOSENSOR	9:30 AM
67	Benjamin Wiedmaier	THE INFLUENCE OF MYSPACE AND FACEBOOK EVENTS ON INTERPERSONAL RELATIONSHIPS	1:30 PM
54	Aimee Wilson	RECYCLING BEHAVIOR STUDY	1:30 PM
404	Peter Wilton	HYDRATION STATES OF MARS RELATED SULFATE MINERALS	9:30 AM
316	Adair Whalen	THE EFFECT OF DEMOGRAPHICS AND ACADEMIC BACKGROUND ON KNOWLEDGE OF INTERNATIONAL AFFAIRS	1:30 PM
82	Krysette Wohlgemuth	FACEBOOK @ MSU: STUDENT ATTITUDES AND USAGE	9:30 AM
127	Sarah Woiderski	PUBERTAL EXPOSURE TO HIGH FAT DIET CAUSES STRAIN-DEPENDENT ALTERATIONS IN MAMMARY GLAND DEVELOPMENT AND ESTROGEN RECEPTOR STATUS IN MICE	9:30 AM
227	Laura Wolaver	ERADICATING GUINEA WORM DISEASE: LESSONS FROM UGANDA AND GHANA	9:30 AM
330	Richard Worhatch	STRUCTURAL DETERMINATION AT SPACETIME LIMITS	9:30 AM
327	Michael Wright	VARIABLE AQUEOUS ALTERATION AMONG CARBONACEOUS CHONDRITES	9:30 AM
325	Emily Young	RESILIENCE WITHIN HEAD START PRESCHOOLERS: PREVALENCE OF DECA PROTECTIVE	1:30 PM
305	Zachary Zalewski	DEVELOPMENTAL EXPRESSION OF PPR PROTEINS IN TRYPANOSOMA BRUCEI	9:30 AM
103	Ian Zang	THE EFFECTS OF EMOTICONS ON INTERPERSONAL EVALUATIONS OF THEIR USERS	1:30 PM
133	Elizabeth Zanley	IS NONDIET ONLINE INTERVENTION FOR WEIGHT MANAGEMENT IN COLLEGE STUDENTS EFFECTIVE	9:30 AM
404	Joshua Zimmerman	HYDRATION STATES OF MARS RELATED SULFATE MINERALS	9:30 AM
274	Jesse Zrull	PETROGRAPHY OF ANTARCTIC CM2 CARBONACEOUS CHONDRITE EET83250	9:30 AM

Abstracts

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

VARIATION IN A FEMALE SECONDARY SEXUAL CHARACTERISTIC MAY EXPLAIN ASYMMETRICAL MALE MATE SELECTION IN TIGER SWALLOWTAIL BUTTERFLIES, PAPILIO GLAUCUS AND P CANADENSIS

Matthew Aardema
Mentor(s): Mark Scriber (Entomology)

Male tiger swallowtail butterflies locate mates by patrolling flyways and nectar sources. If a potential mate is spotted, pursuit by the male ensues. These chases can be energetically costly. In order to avoid useless pursuits, the ability to distinguish between similarly colored male and female conspecifics may be very important. Small patches of blue and ultraviolet coloration found only on the wings of females may help a male make the distinction between each sex. In the eastern United States there are two parapatric species of tiger swallowtail butterfly, the Canadian tiger swallowtail (Papilio canadensis), found in the northern US and Canada, and the eastern tiger swallowtail (P. glaucus) found in the mid and southern US. Previous studies indicate that when P. glaucus males are given the choice to mate with P. glaucus or P. canadensis females, they primarily choose females of their own species. However, when male P. canadensis are presented with the same choice, they overwhelmingly choose P. glaucus females. In an attempt to address this unusual selection pattern, I investigated the blue and ultraviolet coloration of females from each species. I found that female eastern tiger swallowtails have significantly more wing area covered in blue and ultraviolet scaling than do Canadian tiger swallowtail females. If blue and ultraviolet coloration is a cue to the sexual identity of an individual, it may also be an indicator of fitness. Hence, a female with more blue and ultraviolet scaling may be perceived as "fitter" and thus be preferred by males.

STRATIGRAPHIC HISTORY AND GEOCHEMICAL ANALYSIS OF TRIASSICJURASSIC VOLCANIC ROCKS IN THE ALASKA RANGE, SOUTH CENTRAL ALASKA

Michael Ackerson
Mentor(s): Brian Hampton (Geological Sciences)

Recent geologic fieldwork and geochemical lab work from Triassic–Jurassic volcanic rocks of the Chulitna terrane of south-central Alaska allow for a first-order look at the early Mesozoic tectonic history and development of the Alaska Range. Petrographic analysis and major element geochemistry from a suite of Late Triassic (late Norian) mafic lavas, serpentinites, and mafic dikes reveals moderate- to heavy weathering and hydrothermal alteration. Hydrothermal alteration is indicated by veins of anhedral quartz grains within the lavas, and compositional degradation around clinopyroxene crystals within the mafic dikes. Extensive fracturing and olivine remineralization, along with the presence of chrysotile in the serpentinite samples imply medium grade metamorphism. Microscopic stress induced alignment and imbrication of olivine crystals in the serpentinite reaffirms a medium grade metamorphic regime. Major element analysis of dike samples had major element compositions within the range of rhyodacites and dacites. Basalt sample major element chemistry placed the samples within the range of andesites and basalts, while the serpentinite samples were composed nearly completely of Mg and Si, with depletion in Fe typical of the olivine-rich serpentinites. The results of this study are helpful in determining the formational environment of the Chulitna terrane. The near-mantle mafic composition of these volcanic rocks implies little crystal fractionation and rapid magma ascent through the lithosphere. Varied degrees of metamorphism and alteration between the lavas, mafic dikes and serpentinites indicates multiple magma extrusion events. This data, combined with the presence of clastic sedimentary rocks implies an ocean island or mid-ocean ridge formational setting.

USING RELATIONSHIPS TO FIGHT POVERTY

Emily Adama
Mentor(s): Rita Edozie (International Relations)

The emerging hypothesis that relationships constitute an important asset for economic mobility, along with the traditional inputs of physical and human capital, creates important implications for economic development efforts. It has been observed that economic poverty is generally accompanied by social poverty, or the absence of vertical relationships linking the poor to economic opportunities. Ultra poor women in rural Bangladesh provide a prime example of social poverty since they are often

isolated from mainstream society and important social networks. Working with the non-profit organization Building Resources Across Communities (BRAC), I have interviewed thirteen Bagladeshi women classified as "ultra poor" and discussed the role relationships play in their economic stories. Specifically, I examine how the presence or absence of vertical and horizontal relationships provide the women with the capacity to respond to crisis, maintain sustainable livelihoods and have an independent voice. I also analyze how their involvement with BRAC's programs have facilitated such relationships. Before joining BRAC, some women had enough social capital to respond to crisis; however, none had enough vertical relationships to gain access to the necessary credit, information or institutions to improve their condition. Based on the case studies, I conclude that 'induced social capital' is a necessary and important compliment to economic development. The presence of key relationships allows the poor to access necessary informal and formal services which reduce their vulnrability to economic crisis and promotes sustainable livlihoods.

ENDOTHELIN 1 DOWNREGULATES NOREPINEPHRINE TRANSPORTER VIA ENDOTHELIN B RECEPTORS

Carmen Affonso

Mentor(s): David Kreulen (Physiology)

In DOCA-salt hypertension, superoxide anion ($O_2^{-}\cdot$) levels are increased in prevertebral sympathetic ganglia as compared to normotensive controls; this increase is mediated in part by an upregulation of endothelin-1 (ET-1)/NADPH oxidase signaling via the activation of endothelin B(ET_B) receptor. However, the physiological consequences of this increased $O_2^{-}\cdot$ in the neurons have not been clarified. In this study, I tested the hypothesis that ET-1 reduces norepinephrine transporter (NET) expression in PC12 cells via increases in $O_2^{-}\cdot$, and this effect can be abolished by blocking the ETB receptor. Undifferentiated PC12 cells, a model cell line for sympathetic neurons, were treated with either ET-1 (100nM) alone or ET-1 (100nM) plus ET_B antagonist BQ788 (1µM) for 30min, 2hrs, 12hrs, or 24hrs. In ET-1 treated cells, NET mRNA expression decreased over time and reached its minimum at 2 hours and this was followed by a recovery to normal levels after 12 hours to 24 hours of the treatment. However, there was no significant decrease in NET mRNA expression at any of the time points in cells that were treated with ET-1 and BQ788 together (n=4-5). These results indicate that functional ET_B receptor in sympathetic neurons plays a role in the regulation of NET in response to ET-1. The downregulation of NET by ET-1 may be mediated via the NADPH oxidase activation following ET-1's binding to the ET_B receptor on these neurons.

REGULATION OF ACE-2 GENE EXPRESSION BY THE ANGIOTENSINS

Zakir Ahammad

Mentor(s): Bruce D Uhal (Physiology)

Angiotensin II has been well documented as a potent vasoconstrictor and hypertensive agent. Current research has also linked it with apoptosis, programmed cell death. Angiotensin 1-7, the final protein product of the Renin Angiotensin System (RAS) cascade potentially antagonizes the effects of ANG II. The recently discovered ACE-2 enzyme of the RAS has been shown to protect against acute lung injury. This study seeks to determine whether or not ANG 1-7, along with ANG II work together to regulate the genetic expression of Angiotensin Converting Enzyme 2 (ACE-2).

GUIDE RNA TARGETING IN KINETOPLASTID RNA EDITING

Nicole Albrecht

Mentor(s): Donna Koslowsky (Microbiology & Molecular Genetics)

The formation of a gRNA (guide RNA)/mRNA complex is fundamental to the initiation of post transcriptional editing occurring within Trypanosoma brucei, a species of kinetoplastid parasites. The gRNAs, which function within a mitochondrial multiprotein editosome, work to control the insertion and deletion of multiple uridylates (U) at several sites along the mRNA strand, thus creating mature mRNA transcripts which are then subject to translation. The purpose of this study is to investigate the potential contribution of a U-tail towards the gRNAs distinctive ability to commence the RNA editing process. The investigation was carried out through multiple Gel Mobility Assays which were executed for the determination and comparison of the affinity constants occurring between different gRNA/mRNA pairs. For each assay, a range of mRNA concentrations were allowed to complex with 10nM of two distinct radioactive gRNA mutants, differing in whether or not they possessed a U-tail. In data obtained thus far, gRNA mutants possessing a U-tail have produced noticeably lower affinity constants. In addition, further analysis has revealed that the U-tail may play a more significant role in the association, rather than dissociation of the complex. Overall, the results of these experiments support the possibility that the supplementary U-tail, found on all gRNAs, may

contribute to the formation and stabilization of the essential gRNA/mRNA complex, which of significant concern due to its contribution towards the regulation and expression of many mitochondrial genes.

MOST EFFICIENT BAKING MATERIAL

Dua Aldasouqi

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

Scanning electron microscopy is used to determine why aluminum is the most efficient baking material out of glass (pyrex), ceramic cookware (whiteware), and aluminum trays.

EQUINE ANATOMY STUDY

Whitney Allen

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

The goal of the equine anatomy study is to develop a three-dimensional, musculoskeletal model of the horse. This model is useful as a noninvasive method of determining muscle function during locomotion. Such models are beneficial to determining abnormalities in moving horses. This three-dimensional model is constructed in three layers: the bones and joints, the mechanical properties of anatomical segments, and the muscles. The bones and joints are studied using CAT scans and computer software which utilizes reflective markers and infrared cameras. The mechanical properties of the individual anatomical segments are measured using a trifilar pendulum. The pendulum allows us to define the moment of inertia and center of mass for each segment. Once these two layers of the model are adequately studied, the muscles must be studied in order to create a complete model of the equine limbs. The muscles are studied through dissection. The skin is removed from the limb and the muscles are disturbed as little as possible, meaning that the fascia covering the muscular structures is also undisturbed. A goniometer, synchronized with a length transducer, is then used to determine the flexion and extension spontaneous muscle moment arms of each muscle. The tendon insertions and related anatomical landmarks used to standardize the measurements, especially with the goniometer, are predetermined and identified using CAT scans and dissection observations. The current purpose of the study is to test each measurement method for its scientific validity.

MODIFICATION OF CREATINE TRANSPORTER EXPRESSION IN MUSCLE CELLS

Jeffrey Ambrose

Mentor(s): Robert Wiseman (Physiology)

Creatine (Cr) and phosphocreatine (PCr) are critical metabolites used in the creatine kinase system to maintain proper cellular function. Furthermore, increased intracellular creatine (Cr + PCr) has been shown to increase neuromuscular function in human subjects, where the creatine transporter (CrT) is thought to be the limiting step in this process. To investigate the role of CrT expression on intracellular creatine content both tissue culture and transgenic mouse technologies were used. A plasmid containing the rat CrT gene was modified to include a muscle specific promoter and both green fluorescent protein (GFP) and peptide tags. C2C12 myoblasts were transfected with an adeno-associated virus containing this construct and challenged with Cr in the media to assay gene expression and transport function respectively. Transfected cells showed green fluorescence indicating the gene was expressed in culture. Subsequent challenges with Cr in the medium increased the intracellular creatine content and demonstrated CrT was functional in vitro. A transgenic mouse line was generated using this construct and assayed for genotype by polymerase chain reaction (PCR) and phenotype by Western blotting to the peptide tag. Western blot analysis of the mouse muscle phenotype showed that CrT was expressed in all muscle fiber types, including myocardium, at high levels, but was absent from the liver. Taken together these results suggest that the CrT construct is muscle specific and will have functional consequences in vivo, as has been demonstrated in vitro. Studies are currently underway in our laboratory to test CrT function in vivo using magnetic resonance spectroscopy.

DIOXYGENASE GENE DIVERSITY

Chike Anadumaka

Mentor(s): Shoko Iwai (Microbial Ecology)

Polychlorinated biphenyls (PCBs) are stable compounds historically used as liquid insulators in capacitors and transformers. PCBs are toxic and bioaccumulate in the environment rather then being biodegraded. Biphenyl 2, 3 – dioxygenase (bph) genes are responsible for the initial phase in the bio-degradation of PCBs. PCR-cloning was used to analyze the diversity of the bph

genes in samples collected from the Passaic River sediments. Samples were incubated with 13C- labeled biphenyl for 24 and 36 hours. DNA was extracted, and ultracentrifuged to separate heavy DNA from light DNA. The heavy and light DNA samples were used to create clone libraries. Ten to fifteen clones were sequenced from each library. The diversity of bph genes at different incubation time periods in both heavy and light were DNA's compared. Phylogenetic analysis of the time shifts of heavy and light DNA's can contribute to the better understanding of PCB degradation in the environment.

CAN BRAIN FUNCTIONAL MRI MEASURE CENTRAL DRIVE DURING MUSCLE CONTRACTIONS

Bradley Anderson, Maulik Dhandha, Michael Johnson, Matt Nies, Saumya Pathak, Kristin Ramus

Mentor(s): Joseph Carlson (Radiology Osteopathic Medicine), Ronald Meyer (Physiology and Radiology), Jill Slade (Radiology Osteopathic Medicine), Robert Wiseman (Physiology Osteopathic Medicine)

Changes in central nervous system drive to skeletal muscles are thought to play a role in muscle fatigue, particularly in patients with chronic fatigue syndromes. However, there is a present no method to directly measure central drive in the brain. Previous studies using electromyography showed that muscle activity dramatically increases during sustained sub-maximum contractions if the muscle is fatigued by occlusion of muscle blood flow (ischemia). This study uses brain functional magnetic resonance imaging (fMRI) to compare brain motor cortical activity in healthy subjects during sustained handgrip muscle contractions performed with vs. without forearm ischemia. Our hypothesis is that brain motor cortical activity will dramatically increase during ischemic contractions compared to during contractions with blood flow intact, and hence, that fMRI can be used to measure central drive to skeletal muscle.

HISTORY OF THE DOCTOR PATIENT RELATIONSHIP IN WESTERN MEDICINE

Srikanth Aravamuthan

Mentor(s): John Waller (History)

No abstract submitted.

ELECTRON SPIN MEMORY LENGTH IN PALLADIUM-NICKEL ALLOY

Hamood Arham

Mentor(s): Norman Birge (Physics)

The superconducting proximity effect is a phenomenon that causes the critical temperature of a superconductor to decrease when a ferromagnet is placed in contact with it. It is caused by the diffusion of electron (Cooper) pairs into the ferromagnet and by the diffusion of electronic excitations in the superconductor. Palladium-Nickel is a weak ferromagnet that displays this phenomenon. Our aim is to determine the electron spin memory length for Palladium-Nickel alloy to better understand the 'proximity effect'. Electronic spins arise due to the intrinsic angular momentum of electrons. The spin memory length is the distance over which an electron retains memory of its original spin direction while propagating through a metal. The length scale affects how novel forms of superconductivity transmit through the ferromagnet. We determine the spin memory length of Palladium-Nickel from electrical resistance measurements of spin valves. Spin valves are devices comprising of multiple magnetic layers with their resistance dependant on the magnetization directions of these layers. Our spin valves consist of a Palladium-Nickel layer and a Nickel-Iron layer separated by nonmagnetic copper. Spin valves have low resistance when the magnetization directions of Palladium-Nickel and Nickel-Iron are parallel to each other and a high resistance when they are antiparallel to each other. We prepare and analyze our samples at the condensed matter physics laboratories at the Physics department.

UNIVERSITY STUDENTS GENDER STEREOTYPES ATTRIBUTED TO JAZZ PIANO MUSIC

Natsumi Asanuma

Mentor(s): Frederick Tims (Music Therapy)

This study investigated the differences between the perceptions of jazz piano music attributed to male or female jazz pianists. A total of 14 participants (8 female, 5 male) completed surveys on the performances of 1 min music selections with 1 selection attributed to a female performer and 1 selection attributed to a male performer. Prior to listening to the music selections, participants read statements attributing gender to the performers, and performer gender attributions were manipulated for half of the participants by attributing the gender opposite to the true performer gender. No statistically significant differences

in the ratings or descriptions of the music using gender-stereotyped adjectives were found for perceived male and female performers.

AMERICAN INDIAN POVERTY

Jeffrey Astrein

Mentor(s): Carey Larry (Writing, Rhetoric & American Culture)

American Indians are the most impoverished people in the United States. History courses taught in the United States disregard American Indians and their role in American history. The American public fails to recognize American Indians as the poorest people in the United States because they make their assumptions based on visible poverty. Many Indian reservations are isolated from urban cities making them invisible to the general public. There are few organizations that are helping American Indians fight poverty and the United States Government provides little to no help. Large corporations and the United States Government have interest in the natural resources found on Indian land and conspire to obtain the land. These actions are worsening the lives of American Indians living on reservations that are already filled with the highest rates of crime, suicide, and health issues in the United States. This oral presentation will provide a deeper insight into the lives of American Indians and the poverty related issues they are facing today.

THE SEDIMENT RECORD OF PRODUCTIVITY FROM OLIGOTROPHIC LAKES: A MULTIELEMENT APPROACH

Lori Babcock

Mentor(s): David Long (Geological Sciences)

Lake sediment records of nutrients are often used to understand changes in productivity within the lake and land use in the watershed. Oligotrophic lake-watershed systems can provide insight into the cycling of nitrogen and other nutrients in a more natural environment compared to eutrophic or mesotrophic systems. Torch and Mullett lakes, located in the northern Lower Peninsula of Michigan, are oligotrophic lakes that vary in their land use histories and physical attributes (e.g., watershed size). The aim of this study was to interpet the environmental record (i.e., changes in productivity), as recorded in 210Pb dated sediment cores, of these lakes using a multi-element approach. Total nitrogen and total carbon were analyzed using a Perkin Elmer CHN Analyzer; all other elements were analyzed using inductively coupled plasma mass spectrometry with hexapole technology. Compared to literature environmental records Torch and Mullett lakes had low concentrations of total nitrogen (TN). Sediment nutrients concentrations from Mullett Lake were increasing in the top section of the core, suggesting increased primary productivity. Trends of nitrogen and phosphorus from Torch Lake are conflicting; nitrogen concentrations are increasing in more recent sediments whereas phosphorus concentrations are decreasing. This implies a source of nitrogen independent of phosphorus. Although Torch Lake may be an geochemical end-member, the results suggest that the nitrogen record alone may not provide enough information to determine past changes in productivity.

HAND AND CIRCLE GAMES: BLACK FEMALES AND SELFESTEEM

Kelesha Baber

Mentor(s): Denise Troutman (WRAC and Linguistics)

Recent research suggests that self-esteem of Black females has declined, which is a reversed trend from earlier epochs. One method of contributing to a positive development of self-esteem is to teach Black females about positive elements of socio-linguistic practices. I will be conducting a study in an attempt to discover whether or not hand and circle games impact the self-esteem of Black females. I will use both qualitative research and Afrocentric feminist epistemology as theoretical and methodological vehicles for this study. Black females will be participants in the study. Videotapes of hand and circle games and associated language and kinetic movements will be observed and collected from Black females, with analysis focused on their linguistic and non-linguistic behavior. No other research has focused on the socio-cultural benefits of this social practice, which has been generationally preserved among Black females.

BEES AND THEIR EFFECT ON POLLINATION

Kareem Baig, Jon Petersen

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

In this project, my partner and I will be presenting a poster about bees and their effect on pollination. We used a scanning electron microscope to take high-res images of anatomical structures that assist in pollination. In addition, we will show how these structures developed over time and why they developed.

PPR PROTEINS OF TRYPANOSOMA BRUCEI: CLONING, EXPRESSION, AND CRYSTALLIZATION

Nicole Baker

Mentor(s): Jennifer Ekstrom (Biochemistry)

A newly identified family of proteins known as pentatricopeptide repeats (PPRs), are known to contain 2 to 26 degenerate repeat motifs of 35 amino acids. These proteins have been found to have roles in organellar gene expression and it is hypothesized that they are directly involved in RNA editing. The parasitic protist, Trypanosoma brucei, known to be the cause of African sleeping sickness, encodes more of these PPR repeat motifs than any other non-plant, eukaryotic organism. Many of these PPRs are mitochondrially localized and seem to be promising drug targets. Two PPRs from T. brucei, an approximately 27 kDa protein containing roughly 6 repeat motifs and a 51 kDa protein containing 10 to 12 repeats have been isolated and cloned into E. coli. Cloning of the PPR 51 kDa protein was hampered by the protein's toxicity to E. coli. No correct clones were present on blue/white screening plates induced by X-gal and IPTG; however, un-induced plates have now yielded a clone with the correct orientation. Results were more favorable with the PPR 27 kDa protein, and after performing site-directed mutagensis to repair some point mutations in the nucleotide sequence, expression tests were done with myriad strains of E. coli. The 27 kDa protein is strongly expressed, but predominantly as insoluble inclusion bodies. The protein was extracted from the soluble fraction to be refolded and thermal melt and CD analyses of the refolded proteins are underway with hope of future crystallographic studies.

PHANTOM SMOKING

Brian Bandemer

Mentor(s): Mary Bresnahan (Communication)

Research the stigma of lung cancer and what people attribute lung cancer to as well as research on "phantom smokers".

BIOCHEMICAL CHARACTERIZATION OF THE ESSENTIAL GTPASE RBGA

Marci Baranski

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

Ribosome biogenesis GTPase A (RbgA), a highly conserved GTPase, is essential for formation of the large ribosomal subunit in *Bacillus subtilis*. Previous studies have determined that in RbgA-depleted cells an immature intermediate (45S) of the large ribosomal subunit (50S) accumulates. The 45S complex lacks the ribosomal proteins L16, L27 and L36. My research has involved characterizing the biochemical activity of RbgA and several mutant forms of RbgA. An RbgA-His_6 gene fusion under the control of an IPTG inducible promoter was cloned and transformed into *Escherichia coli*. RbgA was overexpressed and purified using HisTrap nickel columns. Kinetic analysis was performed to determine the intrinsic GTPase activity of RbgA and its mutants. It was found that mutations in the GTP binding domains of RbgA significantly lowered the binding efficiency, but not the rate of catalysis. Our lab has purified the different ribosomal subunits of *Bacillus subtilis*, the 30S (small subunit), 50S, and 45S. The 50S subunit is hypothesized to have a stimulatory effect on wild-type RbgA based on the proposed model of GTPase activity to release RbgA from the subunit once it has recruited L16, L27 and/or L36. This hypothesis will be tested by measuring the GTPase activity of RbgA in the presence of ribosomal subunits. This work will help to elucidate how RbgA participates in the ribosome assembly process.

GENETIC BASIS FOR VITAMIN B12 MALABSORPTION IN HUNGARIAN KOMONDORS

Megan Barry

Mentor(s): John Fyfe (MMG)

Cobalamin (vitamin B12) is an essential micronutrient produced in nature only by microorganisms. Mammals must obtain the vitamin from their diet, and it is absorbed in the intestine. Deficiency in the newborn period causes growth failure, abnormal formation of blood cells and metabolic disturbances. The cobalamin receptor is a heterodimeric protein called cubam whose subunits are products of two genes, cubilin (CUBN) and amnionless (AMN). Intrinsic factor (IF) is required to bind cobalamin and mediate binding to cubam on small intestine epithelial cells. We are investigating cobalamin malabsorption in Hungarian komondor dogs. Initial efforts were to find informative genetic markers for each gene candidate and examine allele segregation in a komondor family that segregates the disease. IF was excluded through linkage analysis, CUBN could not be excluded and we continue to search for informative markers for AMN. Since CUBN could not be excluded and no obviously pathogenic sequence variation was found in the cDNA, CUBN expression is being investigated through both western and northern blots. Affected and normal dog levels of expression will be compared and will determine the direction of future investigation.

CUTTING RED TAPE OR PLAYING FAVORITES: A COMPARISON OF BUSINESS DEVELOPMENT ONE-STOP SHOPS IN THE GREAT LAKES ECONOMIC REGION

Alan Bart, Laura Kovacek

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

"In the successful entrepreneurial economy," William Baumol, Robert Litan and Carl Schramm tell us, "it must be relatively easy to start a business, without expensive and time-consuming bureaucratic red tape" (Good Capitalism, Bad Capitalism, and the Economics of Growth and Prosperity, 2007, p. 7). The business development "one-stop shop" is often toted as a key state-level help new business start-ups and relocation. Do one-stop shops actually cut the accumulated bureaucratic red tape? Or do they simply help the state in assisting the types of businesses that state economic development offices have already decided to support—allowing the state to "pick winners" better? The study will address the varied experience of business start-ups by interviewing representatives of businesses that have recently made start-up decisions in the Great Lakes region. The focus of the interviews will be on the role of the various state "one-stop shops" the business engaged with in the process of deciding to start up or relocate, regardless of what decision was made by the business. The goal of the interviews will be to assess the answers to several questions: a) what are the key factors in business start up and relocation decisions other than simple profitability?, b) what role do business development one-stop shops actually play in business start-up and relocation decisions?, c) do one-stop shops actually reduce bureaucratic red tape?, and d) how do the various states' one-stop shops compare in terms of providing assistance to businesses?

CHARACTERIZATION OF PAP AND F1C FIMBRIAL GENE EXPRESSION IN UROPATHOGENIC E COLI USING LUX REPORTER SYSTEM

Adam Bates

Mentor(s): Edward Walker (Microbiology)

The most common etiological agent of uncomplicated urinary tract infections is uropathogenic Escherichia coli (UPEC). Untreated infections ascend up the urethra to the bladder and eventually into the kidneys via the ureters. Cell surface adhesins are important virulence factors required for adherence and colonization of host epithelial tissue. Previous studies suggest that differential expression of unique adhesin types contributes the colonization of specific locations within the urinary tract. P and F1C fimbriae, encoded by the pap and foc gene clusters, respectively, appear to be involved in the colonization of the kidneys, yet optimal expression patterns under in vivo and in vitro conditions have yet to be fully elucidated. Thus, in order to characterize P and F1C fimbrial genes expression, a bioluminescent reporter system was constructed using plasmid pGEN-luxCDABE. A transcriptional fusion between selected pap or foc upstream promoter elements and promoterless luxCDABE was created and introduced into wild-type UPEC strain CFT073. Initial in vitro results confirmed the ability of promoter inserts to drive lux expression. Moreover, results demonstrated nearly 10-fold higher luminescence values for the foc promoter region relative to pap promoters, suggesting that overall promoter activity for F1C fimbrial genes may be significantly greater than that of P fimbria. Preliminary assays using the CBA/J mouse model of ascending UTI demonstrated significant expression of pap and foc genes in vivo, although further studies are needed to confirm if plasmid-based reporter systems accurately reflect chromosomal expression of these fimbrial genes.

EVALUATING THE ADDITION OF POSITIVE REINFORCEMENT FOR LEARNING A FRIGHTENING TASK: A PILOT STUDY WITH HORSES

Laura Bauson

Mentor(s): Camie Heleski (Animal Science)

Horse training often relies upon negative reinforcement (NR). This study tested the hypothesis that adding positive reinforcement (PR) to NR would enhance learning in horses (n=34) being taught to walk over a tarp (novel/typically frightening task). Subjects were Arabians and were handled by the same person. Half were handled 'traditionally' (NR only); i.e. halter/lead were pulled; when horse stepped forward, pressure was released; process repeated until criterion met (i.e. horse crossed the tarp with little/no obvious anxiety). The other half were handled traditionally, but with addition of PR <food + verbal praise> (NR + PR). Subjects 'failed' the task if they refused to walk onto the tarp after 10 min. Nine horses failed; 6 of 9 failures were from NR only. This was not significantly different (P = 0.41). No difference was detected in time to first crossing of the tarp (P = 0.30) or total time to achieve calmness criterion (P = 0.67). Overall, adding PR did not significantly enhance learning this task. However, practical implications were observed; e.g. adding PR made task safer/less fatiguing for the handler.

DEFINITENESS AND INDEFINITENESS IN CHILDREN'S INTERPRETATION OF VERBAL ASPECT

Darius Beasley

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

This project aims at examining the acquisition of (in)definiteness and its interaction with aspect in English. Cross-linguistic comparisons are the subject of another project. It is well-known that children have difficulties mastering definite and indefinite determiners. In this project we test two main hypotheses about the acquisition of definite and indefinite determiners: whether children's problems with the definite stem from a different semantic representation of it, or from their inability to restrict the domain of the determiner or calculate its implicatures. Since determiners also interact with the aspectual interpretations of verb phrases, we will also examine the relationship between determiner knowledge and aspectual knowledge in children building on my theoretical research on aspect and the syntax of noun phrases. We will compare adults responses with children's responses in an elicited production tasks (children are asked to produce sentences in controlled contexts).

THE JOSHUA GENERATION: HIPHOP, STREET TRIBES, AND THE DEVELOPMENT OF YOUTH CULTURE IN BENTON HARBOR, MICHIGAN, 1980-PRESENT

John Beason

Mentor(s): Richard Thomas (History)

This qualitative research study examines the development of youth culture in Benton Harbor, Michigan. Through a series of interviews, this research addresses the growing resentment and sociopolitical disconnectedness of Black youth in Benton Harbor. This relatively small city has a median resident age of 25.5 and a crime index of 1187.1, slightly higher than the nation's 2nd most dangerous city, Detroit, MI, and about Three times that of the national average (City-Data.com). Many of the socio-economic problems are caused by scarce resources, and a lack of opportunities for upward mobility. As a result, Black youth in Benton Harbor have formed a separate culture to address these complex issues. Therefore this study will explore: 1) What are the socio-economic factors that affect life in Benton Harbor? 2) How have Benton-Harbor youth responded to these factors, socially, culturally and socio-politically? 3) What recommendations can be offered to help alleviate the prevalence of youth opposition and defiance of authority in Benton Harbor, MI?

EXPLORING SNAP BRACELETS WITH SEM

Jacob Bell

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

This program is focus on the exploration of a snap bracelet using scanning electron microscope images to explain the properties that the bracelet show. It will use the images to show that either the materials used to create the bracelet or the geometry give the it such properties

COMPARISON OF TOOTH STRUCTURES

Dayna Benoit

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

This project will compare the structures of different areas (inner and outer) and different types (primary and adult) of teeth using the scanning electron microscope.

RELATIONSHIP BETWEEN KNOWLEDGE OF INTERNATIONAL AFFAIRS AND SOURCE OF INFORMATION

Michael Berkowitz, Gillian Cann

Mentor(s): Daniel Kramer (Political Science), Michael Schechter (Political Science)

We conducted a survey for the purpose of researching Michigan State University students' knowledge of foreign affairs and opinions. We focused on the connections between their sources of news and their knowledge of the subject.

IMPACT OF EQUINE NUTRITION PRACTICES ON THE ENVIRONMENT AND ECONOMICS

Chelsea Bickerstaff, Andrea Cohen, Colleen Guidot, Kevin Mazor, Shaina Selbig

Mentor(s): Nathalie Trottier (Animal Science)

Ammonia (NH_3) is a by-product of excess protein that originates from urine and feces. Exposure to ammonia in animal facilities can irritate the eyes and respiratory systems in both animals and humans. It contributes to environmental pollution and may soon become regulated by the Environmental Protection Agency. The purpose of this study is to establish if and how the amount of protein taken in by the horse affects the levels of emitted ammonia, as well as assessing the impact of nitrogen excretion on total ammonia emissions in the surrounding area. A feeding schedule using a 6 x 6 Latin square was established in order to feed six adult Arabian geldings six different diets containing varying levels of protein. At the end of each period, urine and fecal samples from each animal are collected for laboratory analysis of nitrogen. The nitrogen content of feces and urine will be used to 1) quantify and predict nitrogen excretion from protein intake and 2) determine protein utilization in horses fed different levels and qualities of protein. Nitrogen analysis is currently underway using both the HACH and the LECO automated nitrogen systems.

A SEARCH FOR NOVEL MUTATIONS CONFERRING SPECTINOMYCIN RESISTANCE 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. Mutation at position 1123, 1124, or 1125 of the 16S rRNA gene can result in spectinomycin resistance (specR). We have identified a novel 12 bp deletion between bases 1028 and 1039 of the 16S rRNA gene that also confers spectinomycin resistance. However, our studies of spontaneous mutation have shown that not all specR colonies contain a mutation in either of these regions. The goal of the current project is to locate the other mutations in the chloroplast genome 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 DNA. 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. Other sites in the 16S rRNA gene are being investigated, to determine if even more mutations in that gene can confer spectinomycin resistance. 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. However, the chloroplast rps3 gene of Chlamydomonas is unusually large, and is being investigated as a candidate.

ELECTRON BACKSCATTER DIFFRACTION OF METALLIC ALLOYS STUDIES

Lauren Blair

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

Thie project studies the electron backscatter diffraction of metallic alloys.

CAN BRAIN FUNCTIONAL MRI MEASURE CENTRAL DRIVE DURING MUSCLE CONTRACTIONS

Bryan Blase, Robert McClowry, Michael Oliverio, Zach Punch, Michelle Sahm, Daniel Veldheer

Mentor(s): Joseph Carlson (Radiology Osteopathic Medicine), Ronald Meyer (Physiology and Radiology), Jill Slade (Radiology Osteopathic Medicine), Robert Wiseman (Physiology Osteopathic Medicine)

Changes in central nervous system drive to skeletal muscles are thought to play a role in muscle fatigue, particularly in patients with chronic fatigue syndromes. However, there is a present no method to directly measure central drive in the brain. Previous studies using electromyography showed that muscle activity dramatically increases during sustained sub-maximum contractions if the muscle is fatigued by occlusion of muscle blood flow (ischemia). This study uses brain functional magnetic resonance imaging (fMRI) to compare brain motor cortical activity in healthy subjects during sustained handgrip muscle contractions performed with vs. without forearm ischemia. Our hypothesis is that brain motor cortical activity will dramatically increase during ischemic contractions compared to during contractions with blood flow intact, and hence, that fMRI can be used to measure central drive to skeletal muscle.

MULTIMEDIUM MUSIC COMPOSITION

Nathaniel Bliton

Mentor(s): Mark Sullivan (Music Composition)

For this saxophone and computer piece, I use new technology and a cross-media compositional process. Through extensive programming using the graphical computer language Pure Data (PD), I have made a piece of software that records small sections and notes of what the saxophone player plays, and rearranges them to generate musical accompaniment for the saxophonist while being capable of adjusting and responding to the saxophonist's performance. The piece also revolves around a visual medium, compositionally being generated as a musical interpretation of non-musical sketches drawn on paper, and being expressed through shapes and musical notation for the performer to use for visual cues during performance on a constantly shifting computer display.

COMMUNITIES AS LEADERS IN REVERSING ECONOMIC DECLINE: REBUILDING CIVIL SOCIETY, INSTITUTIONS, AND LEADERSHIP CAPACITY TO GROW LOCAL ENTREPRENEURS

Megan Block

Mentor(s): Ross Emmett (Political Theory and Constitutional Democracy), Barb Fails (Product Center)

The decline of the automobile industry in Michigan resulted in great economic hardship throughout the state and left pain to bear on the everyday lives of citizens. State-centered approaches have lacked results in their goal to reverse the decline. Academics, some state administrators, and local officials are realizing that sense of place and entrepreneurship must occur in tandem to spur the growth of an innovative economy. Communities in Michigan who have implemented such approaches have been far more successful in battling the downturn than others. However, efforts to multiply the number of such success stories, particularly in rural areas, have been largely ineffective. The goal of this project is to ascertain why rural communities have been unable to grow entrepreneurial economies locally and what plans are currently in practice in pursuit of these ends. More generally, this study will determine what effective role, if any, the state structure can play in encouraging the endogenous growth of an entrepreneurial employment base in communities of diverse character throughout Michigan.

MATHEMATICAL STRATEGIES FOR TWO-PERSON COMBINATORIAL GAMES

Kathryn Bonnen, Rachel Klavon

Mentor(s): Robert W Bell (Lyman Briggs)

Mathematical investigations and computer simulations can be combined in the search for optimal strategies for two-person combinatorial games. Mathematical proofs of such strategies can be used to generate efficient computer simulations of these games; and, in turn, computer simulations can suggest optimal strategies which might be proven mathematically. As an example consider the following game: let BEAN(n,k) be the game that begins with a pile of n beans; players then take turns removing between 1 and k beans. Given n and k, where n > k, we can predict which player will lose based on who takes the first turn. We will prove that first player loses if n is congruent to 1 modulo (k+1) , i.e. if the initial number of beans is one greater than a multiple of k+1. Otherwise the first player wins.

TOUCH N GO: A PHYSICALLY INTERACTIVE COMPUTER GAME

Will Bonner

Mentor(s): Dan Marsh (Telecommunication, Information Studies & Media)

The goal of my research is to use an intuitive user interface and simple A.I. algorithms to create a realistic and entertaining predator/prey relationship between the human user and their computer in an interactive game environment. I wanted to learn more about the basics of Artificial Intelligence in the context of computer games and I also wanted to explore how an intuitive user interface could enhance the users experience. During the course of my research, I came upon the works of Craig Reynolds. In 1986 he created the "boids" application which accurately modeled the behavior of a flock of virtual creatures moving along random paths in tight coordination through space. Determining the behavior of the flock as a whole comes down to three behaviors (the tendencies of these creatures to "separate" and leave small distances from flockmates, to "align" to an average heading of flockmates, and to "cohesion" among members in the flock to keep the group together). To research how human interaction with these flocks could both replicate a real world predator/prey scenario and how these tendencies of the computer creatures can be manipulated to achieve a goal, I will in summary add a user controlled character and a new behavior to the flock, the behavior to "escape", or avoid the user character. I also created a "corral" of sorts that may contain these computer creatures, and set goals so that the player must effectively use this property to chase creatures into this corral to complete the game.

THE EFFECTS OF EMOTICONS ON INTERPERSONAL EVALUATIONS OF THEIR USERS

Kelly Borycki, Sarah Greenberg, Christine Knasel, Leif Peterson, Jessica Valentine, Amara Vear, Daniel Westrick, Ian Zang

Mentor(s): Joseph Walther (Communication; Telecommunication, Information Studies & Media)

This research explores how the frequency of smiley-faces in computer chats affects perceptions of users. Nonverbal expectancy violations theory drove hypotheses that excessive emoticons lower attraction and credibility of ostensible message-senders. Fifty-five participants were exposed to stimuli varying in emoticon frequency. Emoticon frequency affected how expected behavior was perceived to be, and expectancy violation affected social attractiveness. Other results suggest that previous assumptions about the role and function of emoticons deserve reconsideration.

MOBILE CONTENT SERVICES: A CASE OF OAKLAND COUNTY'S EGOVERNMENT

Clayton Boylan

Mentor(s): Constantinos Coursaris (Telecommunications)

Personal Digital Assistants (PDAs), internet-ready mobile phones and other mobile devices have become an important part of daily life. These devices transform the way people communicate by incorporating unprecedented user mobility and speed in the transference of information allowing people access to information on-the-go. Oakland County, Michigan is committed to serving its communities through empowered and progressive leadership that is entrusted to embrace innovation in every aspect of government. The Oakland County eGovernment leverages existing technologies to provide state-of-the-art programs and services to the community in order to bring citizens, businesses and education closer together with government. Oakland County has a large investment in its CMS and an ever growing citizen base that has quickly adopted the mobile market. Responding to this trend, the Mobile Content Services Initiative (MCSI) was formed in 2006. The MCSI was a joint venture between the Oakland County eGovernment and Michigan State University's Colleges of Business, Communication Arts and Sciences, and Computer Science and Engineering. Michigan State University students worked with the Oakland County eGovernment to investigate the possibilities of leveraging information residing on existing Web content management systems for further delivery to and access by small-format mobile wireless devices. This poster presents the MCSI and its potential for replicating its results to other organizations by sharing the proposed Process Transformation Framework, the developed Mobile Content Platform, the adopted Asset Leverage Strategy, and the flexibility, scalability and reuse potential of the MCSI at large.

BIODIVERSITY WITHIN PSYCHROBACTER SPP

Christopher Bradley

Mentor(s): James Tiedje (Microbiology and Molecular Genetics)

Bacteria develop special characteristics to cope with the environment in which they grow. Without them they would not be able to survive. One major determinant of such environment is the climate. If climate can change the characteristics of a cell's physiology, then there is the possibility for differentiation within a species. To test this hypothesis, soil containing the

psychrophilic bacterial species, Psychrobacter, was isolated from three distinct climate regions. Michigan, San Juan, and Antarctica were three locations selected to represent temperate, tropical and extreme cold climate conditions respectively. The total DNA from the soil was extracted and using primers specific for Psychrobacter spp., the 16s rRNA gene was amplified using PCR. This gene was ligated into a selectable plasmid, transformed into competent cells and sent for DNA sequencing. The resulting data was used to make phylogenetic trees of the three sample sets respectively, each with compiled genetic sequences from known Psychrobacter sequences. This showed that species from the sample sets have similar climate conditions to the known Psychrobacter species climate. The sequences were then analyzed using the computer program DOTUR, which determined the sample's diversity by assigning operational taxonomic units to the sequences and used statistical methods to determine richness and diversity. The samples were also analyzed against each other using a computer program called S-LIBSHUFF to examine how well each sample set covers each other in terms of richness. These results pointed to the fact that the coldest climate, Antarctica, yielded samples that conveyed the greatest diversity of Psychrobacter.

Delay of Game: The Lack of Black Representation in Leadership in College Football

Whittney Brandon

Mentor(s): Carl Taylor (Sociology)

Black football players represent forty-six percent of Division 1-A football teams. Out of 119 of the National Collegiate Athletic Association's (NCAA) football teams only eight are headed by Black quarterbacks. Since 1996, eleven of the 176 head coaching appointments at Division 1-A schools have been occupied by Blacks. While there is a clear predominance of Black players in Division 1-A football, there is a disproportionate number of Black quarterbacks and head coaches. This paper will explore the implicit racial dynamics at Division 1-A institutions that exclude Blacks from participating in athletic headships that are held in high esteem. Using a qualitative research design, this project addresses several key questions. First, how significant of a role do White "power brokers," such as university presidents, athletic directors and coaches play in head coaching appointments? Second, what inconsistencies are at work in the hiring and firing practices of Blacks in Division 1-A. Finally, how might racism, through the theory of Blackophilia, defined as the intense fascination of Black athletes, and Blackophobia, defined as the irrational fear of Blacks; stunt the growth of Blacks advancing in Division 1-A football? Applying a comparative analyzes, this paper utilizes interviews from former Black coaches, athletes and spectators. Challenging and changing the status quo in college football may help further propel the racial movement for equality—sports represent more than just a game.

HOSTILE CAMPUSES: THE IMPACT OF SEXUAL HARASSMENT AND INCIVILITY ON THE PSYCHOLOGICAL WELL-BEING OF COLLEGE STUDENTS

Amy Brandt

Mentor(s): NiCole Buchanan (Psychology)

This study examined the effects of incivility and sexual harassment on the psychological well-being of undergraduate women (N=336). Sexual harassment is any unwanted sexual attention that makes one uncomfortable whereas incivility is any disrespectful behavior or lack of good manners one may experience. Since the majority of sexual harassment and incivility research has been conducted on adults in the workplace this study intends to explore the links between sexual harassment, incivility, depression and symptoms of post-traumatic stress among undergraduate women. Participants filled out the College Experiences Survey, which asked students about their psychological well-being before asking about experiences of sexual harassment and incivility. A mediation model was used to see if the relationship between negative experiences and poor psychological well-being was mediated by the participant's appraisal of the situation. Sexual harassment and incivility were found to be significantly correlated with depression and post-traumatic stress symptoms. However, only sexual harassment and post-traumatic stress were significantly mediated by the participant's appraisal of the situation. Incivility, depression and post-traumatic stress did reveal significant mediation. Incivility may lead to different psychological outcomes because it is a milder form of harassment compared to sexual harassment. The results suggest that women who are exposed to sexual harassment on campus suffer psychologically.

BLACK LABORWHITE WEALTH: THE BLACK MALE ATHLETES QUEST TO FIND HIS OWN

Brandi Bridges

Mentor(s): Pero Dagbovie (History)

The Black male athlete has become a social and cultural icon for the sports industry, his talent and labor produces wealth for those in authority. Despite his wealth, the Black athlete does not hold enough sociopolitical power to establish himself in the positions elite power. Thus the Black male athlete can be defined as a modern day slave, lacking the capacity and will needed to break down the barriers that are preventing him from moving into higher positions within the sports arena. The development of a "modern day slave" can be understood as: strategies of white reactionaries… to take back, dilute, divide, and push back any black achievement, in an effort to restore the same balance of power that has existed in this country since slavery, one in which the bulk of the rewards reaped from black talent and labor are distributed to and serve to perpetuate white power (Rhoden, Forty-Million Dollar Slaves, p.2). Focusing on William Rhoden's work, Forty-Million Dollar Slaves, and through the use of survey's I will measure how Michigan State University college students view the Black athlete and his abilities to hold authoritative positions. Through my research I hope to answer three main questions: Can the black male athlete be defined as a modern day slave? What barriers are preventing the Black athlete from establishing himself in positions of elite power? What steps must he take to break the chains of his enslavement move past the field into positions of sociopolitical power?

GENE SILENCING OF ALC AND IND IN RICE

Trevor Briggeman

Mentor(s): Tao Sang (Plant Biology)

In Arabidopsis the transcription factors IND and ALC are critical regulators of fruit dehiscence, which is necessary for seed dispersal. Using an RNAi (RNA interference) construct developed by Dr. Tao Sang, we plan to silence ALC and IND homologs in rice. We first amplified ALC/IND by PCR and purified the PCR product. ALC, IND, and the plasmid JJ374 were then digested independently using the restriction enzymes SpeI and SacI. Ligation of ALC and IND with the plasmid was then performed separately for each using a TOPO cloning vector kit. The transformed cells were incubated on LB medium. Colonies verified as having the insert were incubated overnight in liquid LB medium, then transferred to centrifuge tubes and stored at -80°C. Rice seeds were sterilized and grown on callus induction media for 4 weeks. Callus tissue was then separated into 2mm pieces and these were transferred to plates of co-culture medium. Agrobacterium was taken from cold storage and incubated in liquid PIM2 medium. Agrobacterium/PIM2 solution was diluted then added to each callus and they were incubated at 25°C for 2 days. The infected calli were then transferred to plates of selection medium with hygromycin. The surviving calli were transferred to shoot induction medium 4 weeks later, then to root induction medium after shoots appeared and grew to a certain height. Plants that make it past this stage will be grown to maturity and the effects of ALC and IND silencing will be studied through anatomy studies and analysis of seed shattering phenotypes.

AP-1 AND ETS ACTIVATION LEVELS IN CANCEROUS AND NORMAL MAMMARY CELLS

Alexander Brown

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

Recent cancer research has identified several molecular targets involved in the genetic regulation of metastatic mammary tumors. Of particular importance are the transcription factors Activator Protein-1 (AP-1) and Ets. 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). Thus, increases in cellular levels of these transcription factors have been associated with aggressive metastatic mammary tumors. To compare relative levels in cancerous and normal mammary cells, a metastatic mammary model had to be established. This was accomplished through a murine mammary cell line (Normal Murine Mammary Gland, or NMuMG) expressing Middle T, a transmembrane oncoprotein of the Polyoma virus. Middle T contains three key tyrosine residues, which upon phosphorylation induces signaling through the MAP Kinase pathway, ultimately incurring increased production of AP-1 and Ets proteins. Using this model, comparisons have been made in the production of the aforementioned transcription factors between cancerous (NMuMG-MT) and normal (NMuMG) cells.

KNOWLEDGE AND OPINIONS CONCERNING INTERNATIONAL AFFAIRS

Teresa Brown, Benjamin Arbitter, Hannah Bach

Mentor(s): Daniel Kramer (Fisheries and Wildlife), Michael Schechter (International Relations)

We have conducted a survey of MSU students measuring their knowledge of international affairs and foreign policy and their opinions on key issues in the field. Thus far we have recieved replies from over 1200 students with diverse backgrounds. We are currently analyzing the data for possible correlations between opinion and knowledge in international affairs.

EARLY ADOLESCENT POSITIVE AFFECT AND YOUNG ADULT HEALTH OUTCOMES

Amanda Brune

Mentor(s): Brent Donnellan (Psychology)

The association between positive affect and improved health has received much attention in recent years. The literature supports a consistent positive relationship between the two factors. However, the causal mechanism for this relationship remains unclear. The present study looks at the relationship between early adolescent positive affect and young adult health behaviors. A cohort of early adolescents was surveyed to establish a preliminary measure of positive affect. A follow up survey given in young adulthood included health behavior measures such as alcohol and drug use and abuse, sex behaviors, preventative health behaviors, suicidal ideation, and physical health.

MUSIC THERAPY INFLUENCES IN AREAS OF SOCIAL AND COMMUNICATION IN AN ADULT WITH FRAGILE X SYNDROME

Sara Buccilli

Mentor(s): Roger Smeltekop (Music Therapy)

In this research, the influences of music therapy in the areas of social and communication domains have and will continue to be studied through clinical music therapy work with an adult with Fragile X Syndrome. I began music therapy treatment with this individual in October 2007 and will continue to collect data through April 2008. The clinical work continues to be done weekly in the MSU Music Therapy Clinic located on the MSU campus and the data collected will include a total of twenty sessions and ten contact hours with the client. The focus of my work includes using therapeutic music interventions for social and communication goals. This includes, for example, working to increase both the client's functional expressive and receptive communication skills and the quality of the client's social interactions. Numerous strategies have been implemented for these needs; for example, the use of an agenda board and communication board, quantitative measurements of participation, and musical interventions to increase social reciprocation and the client's sustained interpersonal contact throughout a complete social transaction. The projected outcome of this clinical work shows increased levels of growth in communication and social skills. Through the interventions and a growing therapeutic relationship, improvements have been reported in increased time of participation, social interactions in taking turns and responding to cues, accuracy in the use of the agenda and communication boards, and others.

A SENSE OF PLACE

Rebecca Budde, Barbra Elenbaas

Mentor(s): Jeff Grabill (WRAC)

Our research project investigates the making of new media histories by neighborhood groups and organizations. We have utilized the techniques of oral history to help people tell their own stories. Second, we have researched our own process in order to create a sustainable method for this writing, so that neighborhood groups can produce these media "stories" themselves.

CONDUCTOMETRIC DETECTION OF ESCHERICHIA COLI 0157:H7

Lauren Bul

Mentor(s): Evangelyn Alocilja (Biosystems Engineering)

This program is about the development of conductometric biosensors that can be used for the detection of Escherichia coli 0157:H7 in ground water. Samples are added to a solution consisting of magnetic polyaniline conjugated with specific antibodies, and then applied to a nitrocellulose membrane biosensor that is based on electrochemical immunoassay. Silver electrodes that are stenciled onto the membrane connect the biosensor to a multimeter to obtain resistance readings.

Concentrations of E.coli 0157:H7 are inversely proportional to measured resistance, since change in the resistance between the electrodes is due to electron transfer that is facilitated by the antibody that coats the polyaniline beads.

INVESTIGATING MICROORGANISMS AS A FOOD SOURCE FOR MOSQUITO LARVAE

Cameron Burns

Mentor(s): Michael Kaufman (Entomology)

Most mosquito larvae depend upon microorganisms as food resources. Although the importance of microorganisms is recognized, relatively little is known about the makeup of these resources and which microbial groups contribute to larval nutrition. In order to study the nutritional contributions of specific microbial groups, larvae must first be reared axenically. This requires surface sterilization of the eggs and the maintenance of larvae in a controlled sterile environment. We attempted this procedure with two species of mosquito: the eastern tree hole mosquito, Ochlerotatus triseriatus, and the yellow fever mosquito, Aedes aegypti. Although successful hatching under sterile conditions was achieved, larval development was inconsistent and often poor using a suite of basal diets. Interestingly, larval development appeared to occur normally when bacterial contaminants were found to be present. This suggests that living bacteria may be necessary as phagostimulants for these species of larval mosquitoes. Research is continuing to develop an artificial diet that can be heat-sterilized and is adequately consumed by young larvae.

RAPID DETECTION OF E. COLI IN RECREATIONAL WATERS

Rebecca Busk, Aubrey Higginbotham, Michelle Slavin, Ashley Varga

Mentor(s): Evangelyn Alocilja (Biosystems Egr.)

The Environmental Protection Agency and the Michigan Department of Environmental Quality mandate waters with recreational use meet specific quality in terms of levels of E. coli bacteria. Though E. coli exists harmlessly in the intestines of all warm blooded animals, pathogenic strains do exist. The current method used for detecting E. coli takes over 24 hours and reporting of results take up to one week. This project aims to reduce testing and processing time through the use of biosensor technology. The group has developed a novel design for the detection of E. coli in recreational waters that consists of a multi-stage mechanized process capable of on-site performance with a testing time of less than one hour.

P33 AND ITS IMPORTANCE TO BACULOVIRUS INFECTIONS

Meg Callahan

Mentor(s): Suzanne Thiem (Microbiology and Entomology), Sally Zhang (Biochemistry)

p33 is a protein conserved among all sequenced baculoviruses. Its function in this virus's infectious cycle has not been defined, but it was previously found to interact with and relocalize human p53 when it was expressed in a baculovirus expression vector. To investigate the role of p33 in baculovirus infection, a knockout of the gene was made in a BACmid construct. The different constructs were then transfected into SF21 insect cells. The resulting analysis of this experiment using a colormetric marker to visualize our cells was that the knockout BACmid did not spread from the initially transfected cells. The wild type control and the rescue construct both showed the same spread from the originally transfected cells to surrounding ones. This data supports the hypothesis/idea that p33 is an important protein for infection by baculoviruses. To determine if p33 interacts with an insect p53, we employed co-immunoprecipitation using transiently expressed proteins. Bluescript constructs were made to express epitope-tagged p33 and Drospophila p53 from the Drosophila heat shock 70 promoter. Co-transfections of SF-21 insect cells, a heat shock period and harvesting of the proteins were followed by a co-immunoprecipation. The results of these experiments are still to come.

THE EFFECT OF GLUCOSAMINE AND CHONDROITIN SULFATE ON PORCINE CARTILAGE

Aimee Campbell

Mentor(s): Michael Orth (Animal Science)

Arthritis is a significant problem in humans, horses, and companion animals. Treatment options are limited, but glucosamine (GLN) and chondroitin sulfate (CS) have been shown to be beneficial. The objective of this study was to investigate whether or not GLN and CS prevent cartilage degradation in pigs. Articular cartilage explants were harvested from five market age pigs after slaughter. Explants were placed in medium for 24 hours, then treated as follows: control medium (CON), recombinant porcine interleukin-1 (IL-1) (15 ng/mL; IL-1), IL-1 (15ng/mL) with GLN (10 ug/mL) and CS (20 ug/mL) (Low-GLN-CS), and IL-1 (15

ng/mL) with GLN (50 ug/mL) and CS (100 ug/mL) (High-GLN-CS). At 24, 48 and 72 h media were removed for analyses. Media were analyzed for proteoglycan, nitric oxide (NO), interleukin-6 (IL-6), and prostaglandin E2 (PGE2) concentrations. Results for proteoglycan and IL-6 concentrations were similar for all treatments except the control; all IL-1 stimulated samples showed increased concentrations compared to CON ($P<0.0001$). On day 1, NO release tends to decrease in the Low-GLN-CS relative to the IL-1 ($P=0.10$), and further decreases in the High-GLN-CS ($P<0.05$). On day 2, PGE2 concentrations in Low-GLN-CS tend to decrease relative to IL-1 ($P=0.09$). These results are similar to previous work done in bovine and equine cartilage. Pigs may serve as a good animal model to study the effects of GLN and CS on joint health.

PUBLIC-PRIVATE PARTNERSHIPS AT THE BASE OF THE PYRAMID: FROM BUZZWORD TO RESULTS

Allison Campbell
Mentor(s): Tracy Gonzalez-Padron PhD (Marketing and Supply Chain)

This paper takes a critical look at public-private partnerships within the Base of the Pyramid (BoP) field. Effective public-private partnerships between multinational corporations and non-governmental organizations (NGOs) or governments are considered a crucial part of achieving success in empowering individuals and improving quality of life for the world's poor at the base of the economic pyramid. However, literature on the BoP does not clearly define public-private partnership. A multitude of case studies exist that champion a vast array of initiatives and programs, from eye-care centers, to solar energy, to individual packets of soap. Our study will attempt to clarify and organize the current work on "Base of the Pyramid," as to avoid it from slipping into ambiguity as a buzz word that dilutes much of its intial relevance and power as a concept for empowering individuals to create sustainable livelihoods. First, from the literature we assess current definitions of PPPs and develop a typology for future research. Then we analyze the outcomes of known cases of PPPs to ascertain the key foctors enabling partnerships to succeed.

GLOBALIZATION AND HUMAN DEVELOPMENT

Michael Carman
Mentor(s): Brendan Mullan (Sociology)

The effects of globalization are a major controversy in the worlds of sociology, economics, and politics today. The phenomenon has been called civilizing, destructive, and varying shades between, to development, local cultures, and other areas of life (Albert Hirschman 1982). Our study focuses on globalization's effects on human development. Drawing on the work of Mauro Guillén (2001) and Salvatore Babones (2006), we view globalization as not only an economic phenomenon but an economic, political, and social movement towards greater interconnection and awareness. In this study, we compare the UNDP's Human Development Index to A.T. Kearney/Foreign Policy Magazine's Globalization Index across the last five years, showing how changes in globalization affect development across time. This will offer an appraisal of globalization as a positive or negative phenomenon on the world's societies.

HIGHLY AMPLIFIED BIO-BARCODE DNA BIOSENSOR FOR THE DETECTION OF SALMONELLA ENTERITIDIS

David James Carr
Mentor(s): Evangelyn Alocilja (Biosystems Engineering)

Salmonella Enteritidis is one of the most frequently reported causes of food-borne illness. It is a major threat to the food safety chain and public health. A highly amplified bio-barcode DNA biosensor for the rapid detection of the insertion element (Iel) gene of Salmonella Enteritidis is reported in this paper. The biosensor transducer is composed of two nanoparticles: gold nanoparticles (Au-NPs) and magnetic nanoparticles (MNPs). The Au-NPs are coated with the target-specific DNA probe (5'-AATATGCTGCCTACTGCCCTA CGCTT-thiol-3' (position: 919 ~ 944)) which can recognize the target gene and fluorescein-labeled barcode DNA (5'-(6-FAM)-TTATTCGTAGCTAAAAAAAAAA-thiol-3') in a 1:100 probe-to-barcode ratio. The MNPs are coated with the 2nd target-specific DNA probe (5'-thiol-TTTATGTAGTCCTGTATCT TCGCCGT-3' (position: 661~686)). After mixing the nanoparticles with the target DNA, the sandwich structure (MNPs- 2nd DNA probe / Target DNA / 1st DNA probe-Au-NPs-barcode DNA) is formed. A magnetic field is applied to separate the sandwich from the unreacted materials. Then the bio-barcode DNA is released from Au-NPs. Because the Au-NPs have a large number of barcode DNA per DNA probe binding event, there is substantial amplification. The released barcode DNA is measured by fluorescence. Using this technique, our preliminary results show that the target DNA is amplified 4000 times. With further optimization, this bio-barcode DNA biosensor can detect very low concentrations of DNA targets at PCR levels.

FRACTAL IMAGES AND ITERATED FUNCTION SYSTEMS

Korey Carter, Todd Morra

Mentor(s): Robert Bell (Mathematics)

The mathematics of fractal geometry can describe many phenomenon that occur in nature. In this talk, we will discuss how to produce fractal images. In particular, we will explain how to generate the fractals knows as Sierpinski triangles, Sierpinski carpets, and Barnsley ferns. The method is to use a mathematical construction known as an iterated function system.

APTAMER SELECTION FOR MICROORGANISM DETECTION PRELIMINARY ASSAYS

Brian Castro

Mentor(s): Evangelyn Alocilja (Biosystems and 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. A key factor of the SELEX process is the polymerase chain reaction (PCR), which amplifies the DNA strains that specifically bind to the target. The double-stranded product of PCR can then be denatured to produce a large quantity of specific, single-stranded DNA aptamers. In this study, a specific set of forward and reverse primers for the random DNA library was used in the PCR optimization. The forward primer was labeled with FITC and the reverse primer was labeled with biotin. Then, using a standard electrophoresis gel, positive amplification was verified. Currently, magnetic separation assays of the biotinilated strand and FITC strand are being conducted to produce single-stranded DNA from the PCR product. Also, flouresence of the FITC is being monitored. With this data, standard curves to relate fluorescence and nucleic acid concentration are being developed.

REDUCING BOTTLED WATER WASTE

Susan Cavicchioli, Katie Daenzer

Mentor(s): Steve Safferman (Biosystems Engineering)

The research focuses on reducing plastic waste, specifically from water bottles, by offering MSU students an alternative reusable water container. By comparing the costs and benefits of various container materials, the research offers Michigan State University an assessment of the advantages and disadvantages of each material including pricing, health concerns, and consumer survey response. The research will conclude with a proposal for an optimal reusable water container design to be distributed to MSU students as promotional material at the Academic Orientation Program.

SECOND LIFE'S INFLUENCE ON USER INTENTION FOR EGOVERNMENT SERVICES IN CONTRAST TO 2-D WEBSITES

Ali Chehab, Sarah Deighan, Khalil Nasser, Margaret Powers, Allison Ribble

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

The research project entails a review and analysis of eGovernment and non-profit organizations' services in Second Life. The main focus of our project is to determine which services, information, and transaction mechanisms are currently found on the two-dimensional (2D) World Wide Web of various organizations that are also present in Second Life. In addition, a survey of services, information, and transaction mechanisms available by these organizations only to Second Life users is underway. The organizations being surveyed and contrasted between Second Life and the Web are the Center for Disease Control (CDC), Missouri I.T., the National Oceanic and Atmospheric Administration (NOAA), the City of LaSalle, and the Michigan Library.
In order to determine if the Second Life extension presence of these groups is going to influence users to use their services, we must also observe whether there are differences in the design elements (e.g. auditory, visual) available in the 2D Website and the Second Life presence. After completing an extensive comparison of the two, we are going develop a survey that will allow us to analyze which of the two media users prefer to use in the context of the services identified. In conclusion, an evaluation of the two interfaces' usability and the users' intention to use them will be conducted.

HOW DIFFERENT INTERFACES EFFECT CONSUMER PURCHASING INTENTIONS

Ali Chehab

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

The proposed model illustrates the various effects that influence the consumers intention to purchase between a two-dimensional interface and a three-dimensional interface. Two-dimensional malls have been avabilable for consumer use for quite some time now, however a three-dimensional mall is still awaiting research and investigation before it becomes available to consumers. The purpose of this investigation is to determine how consumers intention to purchase will differ between the two interfaces and how factors such as ease of use, flow, and learnablity influecnce the consumers decision. This research proposal is important to study because it will allow researchers to see what factors have the greatest effect on consumers intention to purchase. Furthermore, according to an article by K. Lee and N. Chung numerous studies have been conducted to see the issues with a 3-D mall, however further research is needed to investigate the issues with the user interface. This investigation will help determine how the user interfaces of 2D vs. 3D differ in influencing consumer decision.

LOSS OF FACE, SOCIAL ANXIETY, AND DEPRESSION AMONG ASIAN AMERICAN AND EUROPEAN AMERICAN COLLEGE STUDENTS

Yang Chen

Mentor(s): Frederick Leong (PSYCHOLOGY)

This study examines the cultural factors that play a role in depression for Asian Americans. Specifically, we will examine the culturally salient constructs of loss of face, acculturation, and family relationship in relation to depression. We will also test previous findings of perfectionism and social anxiety's relationship to depression in the general population and cultural specific population (Asian Americans). Previously it was noted that loss of face was associated with social anxiety but not depression. We hypothesize that loss of face will be highly correlated with social anxiety similar to previous studies and social anxiety will highly correlate with depression as well. Therefore, there is an indirect connection of loss of face and depression for Asian Americans moderated by the level of social anxiety. We also hypothesize that Asian Americans will have a higher rate of social anxiety and depression as a whole confirming other studies. Perfectionism personality trait should be about the same for European Americans and Asian Americans. We also predict that there will be gender differences for depression as well. Results will contribute to the understanding of cultural factors that affect depression for Asian Americans as well as confirmation of general variables associated with depression.

JURY PRE-DELIBERATION DISCUSSION IN CIVIL TRIALS

Caitlin Cipri, Wesam Agha, Megan Almendinger, Whitney Anderson, Matthew Murray, Kelly O'Connell, Kelsey Smith

Mentor(s): Norbert Kerr (Psychology)

In most U.S. courtrooms, the first opportunity that jurors have to discuss the case with anyone occurs in the trial jury deliberations at the end of the trial. In a few jurisdictions however jurors involved in civil cases have the option to engage in pre-deliberation discussions. This innovation raises a number of concerns, including the possibility that jurors engaging in such discussions might form preliminary judgments before all of the evidence has been presented. Our study focuses on the question of whether and when such pre-deliberation discussions affect the outcome of a civil trial; more specifically if they benefit either the plaintiff or the defendant. Through pilot work, we constructed two versions of a civil trial. The first version contained very strong arguments for both the plaintiff and the defendant and the other version contained weaker arguments for both sides. We then presented the different versions of the case to 321 mock jurors who were randomly assigned to mock juries of 5-6 people each. Approximately one-half of the juries were permitted to discuss the case at the midpoint in the trial; the rest were not. All mock juries deliberated the case at the end of the trial. Preliminary analyses suggest that midtrial discussion enhanced the impact of the evidence jurors heard after their discussion—functionally, the evidence heard during the second half of the trial (the Defense presentation) had a stronger effect on jury verdicts if there had been discussion than if there had been no discussion.

DUBLIN AND BOSTON: CITIES OF SUCCESSFUL CIVIL ASSOCIATIONS

Tara Clark

Mentor(s): Ross Emmett (James Madison College), Louise Jezierski (James Madison College)

In the Honors Thesis, the success of the cities Boston, Massachusetts and Dublin, Ireland are explained by their ability to organize outside of government bureaucracy, in civil associations, and aid the urban poor. By helping the poor, the cities reach success at all levels of the economic scale, not just the top levels. Political theory is used to explain the necessity of solving the issues of the urban poor in order to preserve democracy. In both cities, three non-governmental organizations (NGOs) were studied, serving as case study for the civil associations of the cities. The study questions whether or not the work done by the NGOs should be undertaken by the government, if should continue to be carried out by NGOs, or if some alternative "in-between" should be created.

THE INFLUENCE OF MORAL PHILOSOPHY ON ETHICAL DECISION MAKING

Lindsey Cohan

Mentor(s): Linda Good (Retailing)

This paper explores the influence of moral philosophy on ethical decision making. The study observes two separate phenomenon; idealism v. relativism and justice v. care. Idealism deals with a fundamental concern for others' well being. Relativism relates to the degree to which an individual renounces universal moral codes or principles. Dealing with more basic principles of ethics, justice relates to the level of equality, while "care" is similar to idealism (care scenarios deal with the greater good). This is the first study of its kind. Each construct is measured by several items on our questionnaire. We expect there to be a positive relationship between moral philosophy and ethical decision making in both justice and care scenarios. Furthermore, we also expect business students to rank higher in relativism than idealism. Moreover, this study also looks at the differences between ethical decision making and moral philosophy of men and women. We predict men will rate higher in relativism and women higher in idealism.

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

Ardian Coku

Mentor(s): Imad Ajjawi (Biochemistry and Molecular Biology)

DnaJ-like proteins are apart 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 (FAME) analysis using gas chromatography. The results of several screenings showed a consistent increase in 16:0, 16:lΔ7, and 18:1Δ9 in addition to a decrease in 16:3. Extracting RNA from the mutants and performing reverse transcriptase PCR revealed that the mutants produced no transcript for At1g08640. The wild-type cDNA for At1g08640 was extracted from a gel, purified, and then with the use of gateway cloning was ultimately transformed into Agrobacterium tumefaciens. This was done for the purpose of over expressing the gene in wild-type plants and to complement mutant plants. To confirm results from proteomic studies, that the protein is located in the chloroplast, the protein will be fused with GFP for subcellular localization using fluorescent microscopy. Further experiments will be conducted involving inserting a polyhistidine-tag to the C-Terminus of the protein in order to purify the protein and thus determine how and with what proteins the DnaJ-like protein interacts with.

RESILIENCE WITHIN HEAD START PRESCHOOLERS: PREVALENCE OF DECA PROTECTIVE

Kara Constantine, Emily Young

Mentor(s): John Carlson (Counseling, Educ Psych & Special Education)

This presentation examines the prevalence of protective factors (i.e., resilience) in preschoolers whose poverty status places them at increased risk for later behavioral problems (Qi & Kaiser, 2003). Protective factors of a Head Start population within a diverse urban area in the Midwest were measured through parental reports of children’s behaviors on the Devereux Early Childhood Assessment (DECA: LeBuffe & Naglieri, 1999). Data was obtained as a part of program enrollment materials from over 1200 parents of children participating in the 2007-2008 academic year. Through an analysis of this data, we 1) examine the factor structure of the subscales used to determine the Total Protective Factor T-Score on the DECA; 2) provide prevalence estimates of children who are deemed to have a strong or weak sense of resilience within this at-risk population; and 3)

investigate the role of age and gender within those who are most protected against future psychopathology according to DECA results. This work extends the early identification and intervention literature by (a) reporting on the use of an unstudied tool of early childhood mental health within a large sample of Head Start children and (b) focusing on specific parent-rated social-emotional characteristics that are hypothesized to protect preschoolers from developing later social-emotional difficulties.

THE SHOW EPISODE 63: HOBOS LOVE HOT CHOCOLATE

David Cooper

Mentor(s): Robert Albers (Telecommunication)

MSU Telecasters The Show is the nation's longest running college sitcom, giving students an opportunity to experience television production first hand. The Show tapes four episodes a year live, in front of a studio audience. The episodes are the collaboration of its writers, cast, and crew, all students, in the production of this television program. 'Hobos Love Hot Chocolate' begins with one student's promise to another to watch after a suspicious plant. At the same time, a different student's boyfriend is gone, while she struggles to continue on during his absence.

EVOLUTION OF BACTERIAL CHROMOSOME SIZE

Rebecca Cotter

Mentor(s): Julius Jackson (Microbiology and Molecular Genetics)

Evolution is an ever-occurring process which affects all facets of life. This study is of evolution of bacterial chromosome size and its relationship to the changing geology of earth over time. It has been hypothesized that there was a single ancestral bacterium, from which all others evolved, and therefore, a single ancestral chromosome size. We further hypothesized that this occurred in discrete size units. Our study suggests an overall increase in chromosome size over time and that this occurred in units of 0.32 megabases (Mgb). Also suggested are two “events” in which a greater amount of change occurred. These correspond roughly to geologic changes occurring at that point in time. In this analysis two models were used, both based on the Battistuzzi tree, a phylogenetic tree which allows for the placement of a time of splitting of different branch points from the original, created by Fabia Battistuzzi, et al. The first used an averaging backward method, and suggested an ancestral chromosome size of 2.07 Mgb. The second used modern day chromosome sizes as a starting point, then, when a branch point was reached, considering the smaller of the sizes as the ancestral. This suggested an earliest chromosome size of 0.64 Mgb, and provided the basis for estimation of the unit size of growth of 0.32 Mgb. This proposed unit size was based on the discovery that a number of the chromosome sizes considered are multiples of 0.32.

BIOTECHNOLOGY COMMUNCATION AND OUTREACH STUDY IN SOUTH AFRICA

Steven Couch

Mentor(s): Johan Brink (Institute of International Agriculture)

This project will (a) compile a list of all the biotech stakeholders in South Africa - work with AfricaBio (a biotech stakeholder organization in South Africa), (b) study the outcomes of various public surveys on perception and acceptance of GM products in South Africa, and (c) study the anti-GM campaign and all the role players in South Africa.

CONTRIBUTING FACTORS OF JUVENILE DEPRESSION IN ADOLESCENTS WITH ADHD

Melissa Cousino

Mentor(s): Joel Nigg (Psychology), Molly Nikolas (Psychology)

Background: Attention-deficit hyperactivity disorder (ADHD) and depression commonly co-occur in adolescents; however, few research studies have explored the underlying causes of this relationship. This study will examine four hypothesized risk factors for depression in adolescents with ADHD: current maternal depression, parental ADHD, family stress, and academic under-achievement. Methods: The sample for this research will consist of 182 adolescents (105 males, 77 females), ages 13 to 17 years, who completed a multi-stage diagnostic assessment through the Michigan State University ADHD project (Principal Investigator, J. Nigg). Participants will complete the Children’s Depression Inventory (CDI), Youth Self Report (YSR) and the Kiddie Schedule for Affective Disorders and Schizophrenia (K-SADS) semi-structured interview as assessments for current and past episodes of psychopathology and depressive episodes.

JUICY CAMPUS

Shawna Couture

Mentor(s): John Sherry (Communication)

The purpose of this project is to observe the uses and viral effect across college campuses of a new Internet phenomenon called JuicyCampus.com. JucicyCampus.com is a controversial gossip site in which students from campuses all over the United States can post comments anonymously about any topic they wish. JuicyCampus.com has received a lot of media attention lately, as students begin to voice their concerns about this site. A content analysis will be conducted to determine the various ways this site is being used across the United States on college campuses. Currently there are 61 participating campuses. For the purposes of this study the campuses were categorized and then randomly selected. A sample of 24 colleges was used for this study. A coding list of eight categories with sub categories was created and the intercoder reliability was tested.

COMPARISON OF THE DIFFERENCES BETWEEN 2-D AND 3-D FOR DIFFERENT AGE GROUPS

Sarah Deighan

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

As commerce in three-dimensions become more prevalent and a wider age group becomes active on the Internet, more issues are evolving concerning usability. Different generations sometimes find different environments or navigation methods effective and one interface does not always fit all users. This research proposes that one of the main differences between the generations is the level of spatial ability and that it impacts the effectiveness of different environments and interfaces. The purpose of this research is to determine some of the differences between different age groups' usability needs, especially concerning any advantage or disadvantages between 2-D or 3-D. The age is expected to negatively impact the spatial ability of the user and the ability of the participant is expected to contribute positively to the ease of use of the interface. Dimensionality is expected to positively impact the level of immersion and ease of use, but this positive effect is expected to decrease with a decrease in spatial ability. The perception of the user and ease of use is expected to increase with the level of immersion. Productivity is expected to benefit from more accurate or pleasant perception of the communicated information. In addition, ease of use should contribute positively to productivity.The conclusions of this study will be beneficial to the designers of e-commerce stores. It will allow designers to tailor a particular store to the needs of the target consumer audiences, creating better experiences for customers, increasing the probability of purchases from the target audience.

NADER SHAH'S RELIGIOUS REFORMS: INSIGHT TO CONTEMPORARY POLITICAL ISLAM

Nader Delavari

Mentor(s): None

This paper will attempt to explore an ignored aspect of Nader Shah Afshar's reign. Historians such as Lawrence Lockhart and Michael Axworthy have provided us with invaluable knowledge about the eighteenth century monarch. However, most historians have focused on Nader Shah as general, and have ignored his domestic policies and religious reforms. Nader Shah's brutality and military accomplishments are well known. Yet, Nader Shah failed attempt to eliminate Shi'ism and unite Moslems provides us insight to the fruitfulness of contemporary ecumenical efforts. Nader Shah instituted original religious reforms that have shaped Iran. From the views of contemporary major clerics we can see how Nader Shah's legacy, in terms of religious reforms, have faired.

CONSTRUCTION OF AN IMPROVED ADENOVIRUS BASED VACCINE BY EXPRESSION OF AN EIMERIA SPP DERIVED PROTEIN

William DePas

Mentor(s): Andrea Amalfitano (Microbiology & Molecular Genetics), Daniel Appledorn (Microbiology & Molecular Genetics)

Recently a small protozoan derived protein has been shown to be a potent immunostimulant. In mice, this Eimeria antigen (EA) effectively induces the release of IL-12 as well as various other inflammatory regulators in vivo. Our laboratory is exploring the use of Adenovirus based vectors as vaccine platforms. These vectors show great promise for a number of difficult to treat diseases such as HIV-AIDS and malaria, however their efficacy may be limited. We hypothesized that co-expression of EA with a target antigen in an Adenovirus vaccine will significantly improve the platform as a vaccine. Using XhoI and KpnI restriction sites, the gene for EA was inserted into a specialized pAdTrack plasmid with right and left arm regions homologous to regions on an E1- replication deficient adenovirus plasmid (pAdEasy-1). By recombination in BJ5183 Escherichia coli cells, functional EA

and green fluorescent protein (GFP) cassettes were cloned into the vacant E1 region of pAdEasy-1. This recombinant plasmid was then linearized and used to transfect E1 expressing 293 cells and the resultant adenoviral vector was grown to high titers. This vector will be used to compare cytokine, antibody, and T-cell levels induced by pAd-GFP as opposed to responses induced by pAd-GFP-EA in human cell cultures and in mice. Our hypothesis is that expression of EA along with a target protein via an adenoviral vector will make for an improved Ad-based vaccine.

POST-FEMINISM AND WOMENS MUSIC

Katie Deska

Mentor(s): Ann Larabee (Writing, Rhetoric, and American Culture)

This project will contextualize post-feminism through the music of Ani DiFranco.

COMMUNITY HEALTH WORKERS IMPACT ON CANCER EDUCATION

Monika Dietrich, Emily Brooks, Aisha Henderson, Casey McLean, Shimaa Mousa

Mentor(s): Karen Williams (Obstetrics Gynecology & Reproductive Biology)

Community health workers (CHWs) are liaisons between the medically underserved populations and health services and systems. In this study the women, African-American Latina and Arab, being serviced by CHWs have overall higher breast and cervical cancer mortality then white women. Our driving question: What do community health workers think about the Kin KeeperSM Model as a tool for breast and cervical cancer education? We conducted a focus group session with 13 CHWs (African-American n=5 Latina, n=3 and Arab n=5). The results indicated: 1) Importance of the CHWs coming from the same racial/ethnic group; 2) Home visits generated respect and access to information and; 3) CHW training and resource kits were appropriate. The barriers encountered by the CHWs to recruiting in the overall study were embarrassment regarding the education topics and hesitancy regarding how the information would be used. They were successful in overcoming them. All felt as if they had an impact using the Kin KeeperSM Model as a tool for breast and cervical cancer education. Our study confirms the work of Krieger et al. (2005) that CHWs are successful "because they share community, culture, and life experiences with their clients and are readily welcomed into their homes."

FACTORS INFLUENCING THE LIKELIHOOD OF OBSERVER INTERVENTION IN INCIDENTS OF WORKPLACE HARASSMENT OF EMPLOYEES WITH DISABILITIES

Susan D'Mello

Mentor(s): Ann Marie Ryan (Psychology)

There has been very little research conducted on the contributers to and effects of negative workplace incidents of employees with disabilities. The purpose of this study was to gather observer reactions to negative workplace incidents of people with disabilities. It is suspected that observer interventionwill be more likely if the person has a visible disability, is more similar to the observer, and has recently acquired his or her disability.

AREAS OF GEOGRAPHIC RACIAL EQUALITY BETWEEN HISPANICS AND NON-HISPANIC WHITES IN TEXAS

Ella Dolan

Mentor(s): Joe Darden (Geography)

Unlike most racial equality studies, the research question in this study is whether there are any municipalities in Texas, where Hispanics have achieved geographic racial equality with non-Hispanic whites. I hypothesize that geographic racial equality will be found more often in suburbs of large cities than in towns outside large cities or urban areas of the large cities. The data were obtained from U.S. Bureau of the Census 2000 population and housing data for the entire state of Texas taken from Summary File 4. The methods used were ratios between the median household income of Hispanics and non-Hispanic whites, percentage of population over the age of 25 with a bachelor's degree or above, and the percentage of population over the age of 16 with a managerial or professional occupation. The method used to determine the level of residential segregation was the index of dissimilarity. Geographic racial equality was found in one municipality, Timberwood Park. Because Timberwood Park is a suburb of San Antonio, the hypothesis was supported.

LATIN AMERICAN MUSIC FOR THE SAXOPHONE: UNCOVERING A REGION OF MUSIC

Laura Donnelly

Mentor(s): Joseph Lulloff (Music/ Woodwinds)

Despite the fact that collegiate saxophonists are known for embracing a wide range of musical styles, there is a lack of frequently performed repertoire composed by Latin American Composers. Astor Piazzolla and Heitor Villa-Lobos are the exception to this statement and a small number of their pieces are frequently performed in the recital circuit, in addition to being awarded many accolades for their crowd pleasing compositions. The objectives of my research are to uncover the existence of Latin American art music for the saxophone, and make these pieces available to my colleagues by performing a recital program with the music I find. Through the extensive use of Indiana University's Latin American Music Center, as well as written secondary sources and electronic databases, I was able to uncover music and form an effective recital program that includes music from Cuba, Venezuela, Panama, Chile, Brazil and Argentina. My presentation will illustrate that while some of these pieces incorporate Latin dance idioms, other pieces abstain from these distinctly Latin figures, showing that the composers can embrace their heritage as well as break free of any preconceived musical expectations. The presentation will consist of a brief introduction to the project, followed by a historical introduction to "Fantasia for Saxophone and Chamber Orchestra", along with a performance of the composition's third movement. Then, I will proceed to discuss the Latin American idioms in Aldemaro Romero's "Quarteto Latinamericano", performing examples of specific dance styles, and then perform the third movement of the piece.

INVESTIGATING GENOME SIZE REDUCTION BY EXPERIMENTAL EVOLUTION WITH ESCHERICHIA COLI

John Dover

Mentor(s): Richard Lenski (MMG)

Genome size varies widely in bacteria leading to questions about what functions are absolutely necessary for survival in particular microbial habitats and niches. Determining a microorganism's minimal genomic complement could provide insight into its evolutionary origin and be important for biomedical and bioengineering applications. Current genome reduction efforts have primarily targeted repetitive sequences and nonessential genes for removal. We wondered if laboratory evolution experiments might discover unexpected pathways for genome reduction. Using Escherichia coli B as our model organism, we introduced a selective pressure that would make genome replication costly in an attempt to force bacteria to adapt by discarding nonessential genetic material. E. coli thyA mutants are unable to synthesize thymine, one of the four DNA bases. We propagated twelve populations of thyA mutants in minimal glucose media with successively lower concentrations of thymidine (thymine deoxyriboside). After 150 days of serial transfer (1000 generations), the populations adapted to grow to higher cell densities at low thymidine concentrations and to resist thymineless death as a result of unbalanced growth. Genomic rearrangements and deletions appear to be accelerated by this selective regime. The genetic bases of these adaptations are under investigation.

NEW DIGITAL DEVICES AND ACADEMIC WORK

Greg Dowdy, Megan Curtis, Kathleen Dobruse, Michael Ogilvie

Mentor(s): Steven Weiland (Educational Administration and Teacher Education)

New high-tech digital devices are growing more portable, affordable, and functional by the day. Devices like Apple's iPod Touch and Amazon's Kindle are influencing the ways in which people interact with technology for purposes old and new. Thus, we are beginning to see how these devices may begin to be incorporated into our daily lives in much the same way that cell phones have been in the past decade. At the same time, colleges and universities are seeking to incorporate more technology into teaching and learning. Laptops are now ubiquitous on campus, but other forms of digital portability have been identified with the potential for equally important academic uses. Thus, this study asks: Can portable digital devices like the iPod Touch (introduced in 2006) and the Kindle (introduced in 2007) enhance teaching, learning, and research in postsecondary education? The study compares the capabilities and drawbacks of reading extended texts on the iPod Touch and the Kindle. The research included interviews with student and faculty users of the devices and self-studies by the researchers, who also used the devices. The results indicate: 1) How students and faculty interact with the new devices and with what ideas about prospects for their incorporation into academic work, defined as what students and faculty do in meeting their goals; and 2) What features of the design, application, and functionality of portable digital devices are most likely to make them useful in postsecondary education.

IS NONDIET ONLINE INTERVENTION FOR WEIGHT MANAGEMENT IN COLLEGE STUDENTS EFFECTIVE

Sarah Drake, Elizabeth Zanley
Mentor(s): Sharon Hoerr (Food Science and Human Nutrition), Seung-yeon Lee (Food Science and Human Nutrition)

The objective of this study was to evaluate an online 10-week intervention program designed to help college students maintain weight status. Participants were 231 college students aged 18-24 yr and not majoring in nutrition or exercise science. After pre-assessments of height, weight, waist circumference, and aerobic fitness (Queens College Step Test), participants were randomly assigned into either an intervention (n=113) or comparison group (n=118). The intervention group completed 10 weekly online lessons focused on size acceptance, healthful eating and physical activity. All measurements were repeated immediately post-intervention. Data analysis was conducted using paired t-tests for changes in weight status (BMI=wt in kg/ht in m2), waist circumference, and fitness levels. In addition, General Linear Model Repeated Measure was performed to examine if the intervention had an effect on the changes. Most students (81.8%) completed both assessments. At the pre-assessment, there was no significant differences in any measures between groups. After the intervention, weight increased in both the intervention and comparison groups, +0.8 lb ($P<.05$) and +1.5lb $P<0.01$, respectively. There was a significant change in the BMI only for the comparison group (24.08 vs. 24.29, $P<.01$). However, there was no significant difference in the BMI changes, pre vs. post intervention between the groups. These findings indicate that the intervention had no short-term effect on weight maintenance. A one-year follow-up assessment will be conducted December 2008 to determine long-term effects of the intervention.

THE ROLE OF THE INSULIN SIGNALING PATHWAY IN ORGAN GROWTH AND SIZE REGULATION

Michael Driscoll, Christian Chagas, Mania Kupershtok
Mentor(s): Alex Shingleton (Zoology)

Final body size is a product of growth that occurs during larval development in Drosophila Melanogaster. We are studying insulin as a signaling component for growth regulation. We've looked at genetic components that affect insulin receptor (Inr) efficacy and density on the cell membranes of the developing organs. Results from this experiment were used to determine the relationship between Inr function and final organ size. We found that Inr density has a positive effect on adult wing area and leg length. This effect was countered by down-regulating the Inr density with an exception in the genitals. Final size in the genitals is robust. Our current work focuses on regulation in the developing tissues. Growth is a process that can occur by two processes. The tissues can either increase their cell size or increase their cell division rates. We can manipulate growth by controlling activity in the Inr. We will be using a temperature sensitive Inr mutation that will allow us to control activity in the Insulin Signaling Pathway. This will allow us look at the effects of insulin signaling during period of organ growth. We propose that activity in the Inr of robust tissues is maintained during periods of low insulin signaling.

EFFECT OF RBF PROTEIN TURNOVER ON ITS ACTIVITY

Stephanie Duperon
Mentor(s): David Arnosti (Biochemistry and Molecular Biology), Martin Buckley (Genetics)

The retinoblastoma family of proteins are highly conserved transcription factors that repress genes important for cell cycle, DNA replication, apoptosis, and differentiation. The Drosophila orthologs of retinoblastoma (rbf) genes are rbf1 and rbf2. Understanding of the retinoblastoma genes and proteins is important as many forms of cancer have been linked to mutations in the mammalian retinoblastoma (RB) gene, including Retinoblastoma cancer, a rare eye cancer. Studies have shown that proteolytic turnover of some transcriptional activators is required for their activity. From this knowledge, it was hypothesized that proteolytic degradation may be important for the function of Rbf1 and Rbf2 transcriptional repressors. This hypothesis is the focus of my project. Previous studies from our lab have shown that Rbf1 contains a C-terminal proteasome mediated instability element. When the C-terminus of the Rbf1 protein is deleted, the protein becomes super stable and is not turned over by the proteasome. I am using this knowledge to test the hypothesis that Rbf1 turnover may be important for Rbf1 function. Over-expression of the wild type Rbf1 in the fly eye results in a rough eye phenotype. If the eye phenotype of a C-terminal deletion mutant in an over-expression assay is different from the rough eye phenotype observed in the wild type Rbf1, this may suggest that proteasome degradation is important for Rbf1 protein function.

CHILDHOOD SEXUAL ABUSE AND DELIBERATE SELF HARM: PREDICTIVE RELATIONSHIPS AND MENTAL HEALTH OUTCOMES

Emily Dworkin

Mentor(s): Rebecca Campbell (Psychology), J. Kevin Ford (Psychology)

Past research has established that self-harm behaviors, such as cutting, burning, and hair-pulling are associated with a history of childhood sexual abuse, and both self-harm and childhood sexual abuse are linked to a variety of negative health outcomes. However, the extant research has not examined whether the severity of the sexual abuse trauma is related to specific characteristics of the self-harm behavior. The current study addresses this gap in the literature by examining whether the severity of childhood sexual abuse predicts the type and severity of self-harm, and whether self-harm severity then predicts mental health outcomes such as disordered eating, alcohol abuse, and obsessive-compulsive disorder. Preliminary univariate analyses indicate that a significant relationship exists between the number of types of sexually abusive events in childhood and the frequency of self-harm ($p < .01$), number of self-harming events ($p < .05$), and number of types of self-harming behaviors ($p < .05$). Path analyses conducted to explore the mediational relationships between childhood sexual abuse, self-harm, and mental health outcomes will be discussed.

EARLY MORNINGS, LATE AFTERNOONS

Jeffery Edmonds

Mentor(s): John Burley (Landscape Architecture)

The project overview calls for a thoughtfully designed house and landscape to be built in the Rainbow Lake area in Gratiot County, Michigan. My design focuses on solar as a concept and shows how sun can be integrated into the house and landscape in an interesting manner. In particular, the home is oriented in such a way that allows the rising and setting sun to pass through. Included in the landscape are sculpture pieces and elements that involve the sun in an active way to create unique landscape character.

ALLAH, ABC, AND HIV/AIDS: A COMPARATIVE ANALYSIS OF THE ROLE OF RELIGION IN UGANDA AND SENEGAL

Yvette Efevbera

Mentor(s): Rita Edozie (James Madsion College)

Killing more than 36 million individuals, AIDS has emerged as one of the deadliest diseases in the world. The African continent has been disproportionately affected, and with more than 27 million infected and 12 million children orphaned there, innovative responses to the HIV/AIDS crisis must be found. This research suggests that the inclusion of cultural elements can lead to more effective AIDS policies than are presented today. It specifically examines the relationship between religion and politics in policy, using the case studies of two countries that have successfully addressed HIV/AIDS: Uganda, whose high rate of 15% was decreased by more than half in under a decade, and Senegal, whose epidemic has been contained at less than 2% since the debut of the virus. Both countries have experienced success in different ways, yet the commonalities in response methods include a strong, multisectoral government-led approach. The state alone, however, is not sufficient in responding to a global health, social, economic, and political epidemic and these countries are again comparable for their effective incorporation of civil society, particularly through religion. This research examined the role that religion has played in both countries in its ability to legitimize government-led AIDS campaigns and mobilize the population to effectively reduce infection and improve treatment, care, and prevention. It will do so by providing historical context of the AIDS crisis in the case studies, underlying the capacities of the state that allowed for such responses, and investigating religious influences in contemporary HIV/AIDS policies in both countries.

BIOGAS POTENTIAL SCREENING USING ANAEROBIC RESPIROMETRY

Alyse Egner

Mentor(s): Yan Liu (Biosystems Engineering), Steven Safferman (Biosystems Engineering)

The anaerobic digestion of substrate from fruit and vegetable processors may serve as a treatment method for wastewater and provide a source of energy by producing natural gas that can help offset the cost of treatment. In order to determine the biogas potential and biodegradability of food processor waste streams, this study utilizes an anaerobic respirometer to estimate production and analyzes the subsequent methane fraction through gas chromatography. Four specific conditions are sampled; each sample is digested in two flasks. The first flask strips carbon dioxide exiting the digestion process allowing only the methane to be measured. The second flask is used to measure both carbon dioxide and methane. This study also investigates

pretreatment methods and optimal conditions for anaerobic digestion. A case study on substrate from a fruit juice processing plant will be highlighted and analyzed.

COMPARISON OF CARBONACEOUS CHONDRITE METEORITES TO RESULTS FROM THE STARDUST MISSION

Laurel Eibach

Mentor(s): Michael Velbel (Geological Sciences)

Carbonaceous chondrite meteorites and interplanetary dust particles (IDPs) are aggregates of many materials. These meteorites and other such primitive solar-system materials serve as records of the early solar system. Carbonaceous chondrite meteorites and IDPs contain grains of metal-sulfides. In both, the amount of nickel in these metal-sulfides is related to the degree of aqueous alteration of the material. Nickel-iron sulfides are found in hydrous IDPs and Type 2 carbonaceous chondrites, while nickel-free iron-sulfides occur in anhydrous primitive solar-system materials. Preliminary results from this study confirm the presence of iron-nickel sulfides in an extensively altered CM2 carbonaceous chondrite (QUE 93005). Metal-sulfide materials have also been confirmed in the fragments of comet 81P/Wild 2 captured by the Stardust mission. This study compares the metal and sulfide minerals of QUE 93005 to the Stardust comet samples. The results of the comparison help to identify the similarities and differences between Stardust comet samples and other primitive solar-system materials.

ANALYSIS OF CARDIAC NOREPINEPHRINE (NE) TRANSPORTER (NET) MRNA AFTER REMOVAL OF THE STELLATE GANGLIA

Mohammad Esfahanian

Mentor(s): David Kreulen (Physiology)

NET is an important protein in the regulation of catecholamines, particularly NE, and its dysfunction has been linked to certain cardiovascular diseases. To evaluate the contribution of the sympathetic innervation from the stellate ganglia as a source of NET in the heart, we compared by qPCR NET mRNA in the heart in control rats to rats after removal of stellate ganglia. NET mRNA was present in heart homogenate, with atria expressing more NET mRNA than ventricles ($p<0.05$, $n=4$-6). Adult, male rats underwent bilateral stellate ganglionectomy (SGX) or sham surgery and hearts were assayed by chamber two weeks later. To confirm successful denervation, NE content was measured by HPLC and was reduced uniformly by 85.96% in all heart chambers ($p<0.001$, $n=4$-5). Although NE was depleted, there was a significant increase in NET mRNA ($p<0.05$, $n=5$) in the left atria while no differences were seen in any other chambers ($p>0.05$, $n=4$-6). The presence of NET mRNA after SGX suggests that NET mRNA is present in non-stellate sources and is regionally increased by removal of the sympathetic innervation.

THE LAND OF SINIM: THE TAIPING REBELLION, CHINESE CIVIL WAR, AND THE THEOLOGICAL PENETRATION OF THE WEST

Ryan Etzcorn

Mentor(s): Aminda Smith (History)

At the edge of modern Chinese history stands an era of rebellion, chaos, and violence that set the stage for the fall of an imperial dynasty—it would be China's last. By far the most disruptive force in the middle kingdom throughout the mid-nineteenth century, the Taiping rebellion throttled whatever semblance of stability that previously existed and fueled itself with the revelations of a curious new doctrine: Christianity. Since the early missionary work of Jesuit missionaries in the seventeenth century, western evangelists were instilled with the insatiable drive for the realization of a Christian China. Early laborers of God jumped on an interesting passage from Isaiah 49:12: "Behold, these shall come from far; and, lo, these come from the north and from the west, and these from the land of Sinim." Crippled with economic depression and socio-political tumult, China was that land. This presentation intends to observe the development of Taiping Christianity as a mutative interpretation of scripture, with special emphasis on foreign reactions to the failure of culturally transmitting Occidental Christianity. Westerners in China reacted to the Taiping mission with both wild enthusiasm and passionate abjuration between the years of 1850 and 1864. Then again, the most significant result of one native son's chance contact with a mysterious foreign book, and the civil war that followed, was that by 1864 twenty million people lay dead. The worst human catastrophe of the nineteenth century began with a vision and a bible.

DIMINISHED MNSOD CONTRIBUTES TO ENDOTHELIAL PROGENITOR CELL DYSFUNCTION, IMPAIRED ANGIOGENESIS AND WOUND HEALING IN TYPE 2 DIABETES

Adrienne Niku Falandino

Mentor(s): Alex Chen (Pharmacology & Toxicology), Eric Marrotte (Osteopathic Medicine)

Background: Circulating endothelial progenitor cells (EPCs) are both reduced and dysfunctional in diabetes with poorly understood mechanisms. Normal EPCs express intrinsically high MnSOD levels and are resistant to oxidative stress. We hypothesized that hyperglycemia-induced oxidative stress leads to EPC dysfunction and delayed wound healing in type 2 diabetes. Method and Results: Adult male (C57BLKS/J, 10-14 weeks) type 2 diabetic db/db and their normal littermates db/+ mice (glucose 270.4±38.3 vs. 153.6±4.8 mg/dL, n=5, $p<0.01$) were used. EPC number was significantly lower in db/db vs. db/+ mice (n=4-5, $p<0.05$), paralleled by increased levels of superoxide anion (O2-) (DHE positive cells, $p<0.005$). MnSOD mRNA and protein expressions were decreased by 50% (real time RT-PCR, $p<0.05$) and 60% (Western Blot, $p<0.01$) in db/db vs. db/+ mice, respectively. EPC-induced angiogenesis was impaired in db/db vs. db/+ mice (Matrigel, tubes/high powered field, $p<0.05$), with a concomitant delay in wound closure (32.4±2.5 vs. 15.2±0.5/days, $p<0.001$). EPCs (106 cells) of db/+ mice, when transplanted onto the wounds of db/db diabetic mice, significantly accelerated the closure. Conclusion: EPCs of type 2 diabetic mice have diminished MnSOD expression against oxidative stress and impaired angiogenesis. Cell therapy of EPCs from normal mice results in significant acceleration of wound repair in type 2 diabetic mice.

GENETIC MAPPING OF A GENE THAT REPRESSES FLOWERING

Danielle Fasseel

Mentor(s): Steve van Nocker (Horticulture)

In the model research plant Arabidopsis thaliana, a regulatory gene called FLC is required for repressing the developmental transition from vegetative growth to flowering. We previously used a genetic screen to identify several loci required for the maintenance of FLC expression. The goal of this project is to genetically map and identify one of these loci, designated VIP7. We generated a recombinant mapping population segregating for homozygous recessive vip7 plants. Molecular markers were generated using the genomic sequence and physical map of Arabidopsis, and analyzed for linkage to the mutant allele. The VIP7 gene was localized to a ~250 kb region containing 80 known genes. One of these genes encodes a protein related to a component of a human histone methyltransferase complex, which is required to maintain the activity of developmentally important Hox genes in humans. We are evaluating the possibility that this candidate gene is VIP7.

PHYSICAL ACTIVITY FOR PERSONS WITH AUTISM: PARTICIPANT PERSPECTIVES

Maria A Feldpausch

Mentor(s): Mary Martha Douglas (Kinesiology), Gail M Dummer (Kinesiology)

Physical activities can contribute to a healthy life, friendships, enjoyable use of community resources, and independent living – important outcomes for persons with autism (Tsai, 2007). The purpose of this study is to interview 20-35 people with autism ages 11-26 to determine their preferred physical activities and their choice of active versus sedentary leisure activities. The interview protocol consists of: (a) questions for the parent about the participant's ability to assent to the interview, usual mode of communication, and usual involvement in leisure activities; (b) questions for the participant about preferred physical and sedentary leisure activities; and (c) follow-up questions for the parent about the validity of the participant responses. To date, 10 parent/participant interviews have been completed. When asked to rate their top three physical activities, participants named bowling (n=5), biking (n=4), swimming (n=4), basketball (n=3), and walking (n=3). The most frequently mentioned sedentary activities included computer (n=6), video games (n=5), and watching television (n=4). Overall, sedentary activities were preferred over physical activities (n=1 active, n=9 sedentary). These findings will be revised following the addition of at least 15 more participants. A reliability analysis is underway, in which each participant is interviewed three times to verify consistency of responses. But even the preliminary findings demonstrate that children with autism may be living very sedentary lifestyles, which in turn could have possible negative consequences for health and well-being.

FUNCTIONAL ANATOMY OF READING STORIES VERSUS SOLVING MATH PROBLEMS USING FMRI

Dana Ferrari, Sarah Browning, Mary Schmidt

Mentor(s): Jie Huang (Radiology)

Functional magnetic resonance imaging (fMRI) is an emerging technology that allows researchers to effectively "map" brain activity through the use of a MRI machine. This study was specifically designed toward comparing brain activity during different assigned tasks. The study selected six participants, three females and three males, all of whom were right-handed and were between the ages of 18-22. The subjects received an fMRI scan while randomly alternating between reading stories of both a non-emotional and emotional nature, and solving problems of both algebraic and arithmetic origin. The study hypothesized that different areas of the brain would be more active during different tasks. The subjects were asked to perform a series of four trials; each consisting of eight randomly ordered tasks. The tasks were given in a random order to attempt to eliminate anticipation as an additional variable in the experiment. Out of the eight questions, two were considered "neutral" or unemotional stories, two were considered "upsetting" or emotional stories, two were algebraic problems with one variable, and two were arithmetic problems of a simple nature. After the data was collected, the images produced allowed researchers to make a connection between certain areas of the brain and corresponding activity levels. Data indicates that both reading and mathematical tasks stimulate the visual cortex, however, the reading tasks show almost twice the amount of activity, consistent with the more visual stimulation of the reading tasks.

HUMAN RIGHTS IN THE THIRD WORLD: THE COMMONWEALTH AND LA FRANCOPHONIE

Danielle Ferry

Mentor(s): Bryan Ritchie (International Relations)

With the recent advances in communications technology, there has been a surge of interest in global human rights issues. What was once a state issue is now a world issue; accordingly, advocacy groups now have international scope, and focus largely on the developing world, where human rights transgressions are often most severe. If these international advocacy groups are to have an impact on human rights issues, they must change not only the laws that govern state action and people's rights, but also the social norms that dictate what is acceptable in society. Two unique examples of transnational social movements that would seem to have an advantage in changing social norms as well as laws are the Commonwealth of Nations and la Francophonie. Because these organizations, based on colonial legacies, assume some cultural similarity amongst members, one might believe these organizations to be more capable of changing social standards, and consequently of having a lasting impact on human rights in developing nations. However, they also have imperial histories that shape their actions in significant ways, keeping them from interfering in domestic policies, especially in developing countries. So how effective are the Commonwealth and La Francophonie at changing human rights conditions in developing member states? Using both quantitative and qualitative methods, this paper finds that these organizations do not act enough on their ambitious proposals, and thus have had very little effect on human rights standards in their member nations despite their apparent advantages

THE ROLE OF HREV7 IN HUMAN MUTAGENESIS

Kathryn Fletcher

Mentor(s): Veronica Maher (BMB)

In the event of exposure to DNA damaging agents, such as UV irradiation, fork-blocking lesions may occur. In these incidences, cells may use translesion synthesis in order to replicate past the damaged DNA. This type of replication may be error-prone and as such may induce mutations. One polymerase known to execute translesion synthesis is DNA polymerase zeta, which consists of two subunits, hRev3 and hRev7. Using small, interfering RNA (siRNA), our lab generated human fibroblasts with reduced levels of hRev7. We determined that cells with reduced hRev7 are more sensitive to the cytotoxic effect of UV irradiation and demonstrate lower UV-induced mutation frequencies compared to normal cells. These data strongly suggest that hRev7 plays a role in UV-induced mutagenesis in humans.

To demonstrate unequivocally that these differences in cytotoxicity and mutation frequency are the result of the decreased hRev7 protein, we restored the level of hRev7 in these cells by transfecting them with a vector carrying the gene coding for hRev7. This vector was genetically engineered to express a hRev7 mRNA that is unable to be targeted for degradation by siRNA. Numerous independently-transfected cell strains were isolated and assayed to identify those that were determined to have levels of hRev7 at least as high as normal. The UV-induced mutation frequencies and survival rates of normal human fibroblasts,

human fibroblasts with reduced levels of hRev7, and human fibroblasts in which the level of hRev7 has been restored, are currently being investigated.

OPINION AND FOREIGN AFFAIRS KNOWLEDGE

Christopher Fort, Michele Hillman

Mentor(s): Daniel Kramer (Fisheries and Wildlife), Michael Schechter (Political Science)

How our the opinions of our survey participants affect their answers about international affairs. We hypothesize that support for the Iraq war negatively affects one's knowledge of international affairs and that support for internationalization positively affects one's knowledge of international affairs.

CHARACTERIZING AMINO ACID TRANSPORT ACROSS THE EQUINE GASTROINTESTINAL TRACT

Patrick Foth

Mentor(s): Nathalie Trottier (Animal Science), Adrienne Woodward (Animal Science)

Little is known about rates of protein digestion, amino acid absorption, and site of amino acid absorption in horses in response to feedstuffs of varying protein quality. This knowledge is essential in developing strategies to improve dietary protein formulation and increase nitrogen efficiency in horses. The objectives of this study were twofold. Objective one was to profile amino acid concentration in blood serum of horses following feedings of six different diets: alfalfa, first cutting; alfalfa, second cutting; alfalfa, third cutting; grass hay; grass hay plus 1 kg oats; grass hay plus 2 kg oats. Each diet contained various concentrations of crude protein. Objective two is to determine transport capacity and transport affinity of a selected amino acid transport system in small and large intestinal tissue. For Objective one, six horses were randomly assigned to a 6 x 6 Latin Square design with each horse receiving one of the diets for 10 days before blood samples were collected. Blood samples were obtained via jugular venipuncture 30-minutes prior to feeding, and then over a 4-hour period following feeding. Blood was centrifuged, and serum was collected and frozen at -20°C before analysis of amino acids was performed with high pressure liquid chromatography. Objective two is currently underway with optimization of assay using intestinal tissue. Results will relate and contribute to the identification of the mechanisms behind protein and amino acid absorption in the gut of the horse.

A FUSION PROTEIN OF MALTOSE BINDING PROTEIN AND URED, AN ACCESSORY PROTEIN INVOLVED IN UREASE ACTIVATION

Bruce Fraser

Mentor(s): Robert Hausinger (Microbiology)

Urease is a Ni2+ containing enzyme found in a wide assortment of plants, fungi, and prokaryotes. It catalyzes hydrolysis of urea to ammonia and carbon dioxide. Pathogenic microorganisms such as Helicobacter pylori and Proteus mirabilis utilize urease as a virulence factor for gastrouodenal and urinary infections, respectively. The urease operon of non-pathogenic Klebsiella aerogenes, consists of seven genes, three products (UreABC) constitute apourease. The remaining products (UreDFG and UreE) are involved in Ni2+-dependent holoenzyme activation. UreD is directly involved in the placement of Ni2+ into apourease when associated with UreFG. Using PCR, ureD from the recombinant urease operon was amplified. The product was cloned into vector pGEM-T Easy and sequenced to confirm the location of ureD within the plasmid. To create a soluble UreD product, its gene was then cloned into pMAL-c2 to create a Maltose Binding Protein (MBP)-UreD fusion. The plasmid was then transformed into Escherichia coli to over express the pMAL-UreD products. Expression levels of MBP-UreD fusion were tested at 30°C and 22°C, with the latter displaying higher yield. The resulting MBP-UreD fusion protein was purified by affinity chromatography using an amylose resin. Cloning ureABCEFG into pMAL-ureD, resulted in the detection of low levels of urease activity, demonstrating that the MBD-UreD fusion protein is active. Currently, the physical properties of the purified UreD fusion are in the process of being characterized.

BIOCOMPATIBILITY OF AMORPHOUS DIAMOND LIKE CARBON COATED TI AND COCRMO IMPLANTS

Robert Friederichs

Mentor(s): Melissa Baumann (CHEMS)

The demand for total joint replacement (TJR) surgeries, including total knee and hip replacement, has increased steadily due to the aging baby-boomer population that is living longer, more active and paradoxically obese. As a result, revision surgeries needed to replace failed implants are rising as well. Implant failure is commonly due to high wear rates and/or corrosion of the implant metal. Amorphous Diamond-like-carbon (DLC) coatings offer lower coefficients of friction on wear surfaces, are harder

than other implant materials, are chemically inert, and are corrosion resistant. DLC coated and uncoated Cobalt Chrome Molybdenum and Titanium alloys (both industry standard alloys) were used along with murine osteoblasts (OB). OB attachment studies, Live/Dead assays, and scanning electron microscopy (to view OB morphology) were conducted to determine the in vitro biocompatibility of DLC. There was no significant ($p<0.05$) difference in OB attachment observed between DLC-coated and uncoated samples. DLC-coatings had a significantly ($p<0.05$) higher percent cell death when compared to the uncoated samples. However observed OB death on the DLC samples is still low when compared to the literature. OBs spiculated and spread on both coated and uncoated alloys as is common to OB morphology. These biocompatibility tests indicate that amorphous DLC coatings show promise in medical applications including TJR.

IDENTIFYING BARRIERS AND IMPROVING NUTRITION SCREENING AND COUNSELING IN CHILDRENS WELL CHILD VISITS

Shannon Friedgen, Rachele Gillengerten, Courtney Watkins
Mentor(s): Sharon Hoerr (Food Science And Human Nutrition)

Objective: This study aimed to explore pediatric residents' perceptions of barriers and needs for nutrition screening and counseling in well child visits using qualitative research methods. Methods: In-depth interviews (n=19) and observations (n=6) were conducted with resident physicians in a teaching clinic. Interview items probed for well child visit routine, importance of nutrition/diet information, guidelines used, and barriers to screening/counseling. Content analysis was conducted on transcripts from audiotapes and field notes. Well child observations were conducted using a checklist which covered typical components of well child visits as well as interactions during the visit specifically related to nutrition. Results: Residents believed that nutrition is an important part of well child visits in order to provide essential nutrition information to caregivers and to detect nutrition problems early enough to address health and developmental issues. Residents used direct questions and discussion with caregivers to obtain nutrition/diet information about their children. Residents used well child anticipatory guidance form and yes/no questions for nutrition screening/counseling. Major barriers included time constraints and lack of the caregivers' knowledge and receptiveness. Residents wanted to have more dietitians available, a questionnaire for nutrition screening and age specific handouts/visual aids in the waiting/exam room. Conclusions: These findings will be used to develop nutrition screening/counseling protocols and handouts to improve the efficacy of nutrition care in well child visits.

This study was supported by Families and Communities Together (FACT) Coalition at MSU, CANR Undergraduate Research Program, and Michigan Agricultural Experiment Station (MAES).

THE DIFFERENCES BETWEEN MUSICIANS AND NON-MUSICIANS IN LISTENING TO MUSIC

Sayako Fujii
Mentor(s): Frederick Tims (Music Therapy)

The present study investigated the differences between musicians and non-musicians in the way they listened to and responded to music. The importance of music for each group was also reported. 10 musicians and 10 non-musicians (age 19-26; 5 males, 5 females for each group) listened to 2 recorded musical excerpts from a lap-top and answered questionnaires related to the excerpts. The results indicated that musicians listened to classical music more analytically whereas non-musicians listened with their feelings. With this regard to popular music, the results were different because the musicians did not listen to the song analytically. Music was important for both groups but with different reasons. The findings demonstrated their former music training affected the perception to some extent.

LIGHT MUSIC

Gregg Gaddy, Nathaniel Bliton
Mentor(s): Dan Marsh (Telecommunication, Information Studies & Media)

In recent years, there has been a notable shift in the market for inexpensive, simple, pick-up-and-play electronic devices, most notably Nintendo's Wii. This project is looking into reappropriating readily available technologies to create interactive installations for educational and artistic purposes. The project will involve writing software in the Processing and Pure Data programming languages. This software will track beams of laser light (from standard laser pointers) via a webcam and translate the motion of the light into music. The software will react to a variety of actions, and the way the virtual instrument is played will be up to the person using it.

EL SEEDO DARKO

Cory Garcia, Tyler Tagami

Mentor(s): Bob Albers (Telecommunication)

A video short of a fictional spanish soap opera.

EXPRESSION AND PURIFICATION OF PSEUDOMONAS SYRINGAE HOLPTOY

Mark Gaynor

Mentor(s): Dennis Arvidson (Microbiology)

Many gram negative bacterial pathogens cause disease by injecting virulence proteins in host cells via the type III protein secretion system (TTSS). Inactivation of this secretion system results in a loss of pathogenicity. A basic feature common to all TTSS is the assembly of a needle/pilus-like secretion structure that serves as a conduit to translocate effector proteins into host cells. We are studying Pseudomonas syringae as a model TTSS of a plant pathogen. The major subunit of the P. syringae type-III pilus is the HrpA.. The amino acid sequence of HolPtoY, a protein from P. syringae pv. tomato, is similar, most notably near the C-terminus, to the HrpA amino acid sequence. Mutant HrpA proteins with changes of amino acid residues in this region are defective for Hrp pilus assembly. We hypothesize that HolPtoY, may interact with HrpA, possibly at the tip of the Hrp pilus. Solving the x-ray crystal structure of HolPtoY will add to our understanding of its function and may allow us to model a portion of the HrpA protein structure.

BRIEF: THE STORY OF BLOODBOIL

Frank Geist, Cory Garcia, Tyler Tagami

Mentor(s): Bob Albers (Telecommunication)

This is a mockumentary video about a fictional musical group called BloodBoil.

GOTH-AM CITY 2

Frank Geist

Mentor(s): Bob Albers (Telecommunication)

This is a documentary about Goth culture in Camden Town, London.

GEOGRAPHIC RACIAL EQUALITY BETWEEN WHITES AND ASIANS IN METROPOLITAN DETROIT

Amelia Gessner

Mentor(s): Joe T Darden (Geography)

This paper addresses the issue of geographic racial equality between Asians and Whites in Metropolitan Detroit in 2000 based on four indicators: income, educational attainment, occupational status and unevenness/segregation. Tract-level and place-level data were collected from the 2000 US Census Summary Tape Files 3 and 4. This study tests the hypothesis that geographic racial equality between Whites and Asians exists in nearly every municipality where Asians reside. Place-level data was used to perform simple comparisons between data for socioeconomic factors (income, educational attainment, and occupational status). Tract-level data was used to measure residential segregation (unevenness) using the index of dissimilarity. Geographic racial equality was found in all municipalities with sufficient Asian populations. The study was limited by the lack of a sufficient number of Asians in the populations of many municipalities.

USE OF EDGE HABITAT FOR FORAGING BY NORTHERN GOSHAWKS

Carolyn Gillen

Mentor(s): Gary Roloff (Fisheries and Wildlife)

The Northern Goshawk (Accipiter gentilis) is a raptor that inhabits Holarctic forests. Several studies have examined goshawk foraging habitat and concluded that mature forests with open flyways between vegetation layers are used most often; however, there is less information on the importance of younger forest stages. We investigated the importance of edge habitats for foraging by goshawks in northern Minnesota. We hypothesized that goshawks exploit edges to hunt for prey species that use early successional vegetation, such as snowshoe hare and ruffed grouse. Data from 20 radio-telemetered adult goshawks were collected from 1998-2000 at an estimated 30-meter locational accuracy. We obtained a satellite-derived landcover classification layer for the study area. Using geographic information systems (GIS), we quantified the effect of

locational accuracy on distance-to-edge calculations. The telemetry error was deemed negligible (standard error < 0.08 m); therefore, we continued our analysis with the actual telemetry locations. Distances between each location and the nearest edge of mature forest, young forest, open, and non-habitat patches were measured. For each goshawk home range, we generated a number of randomly-located points equal to the number of telemetry locations. Comparing random and actual distances to edge will reveal whether edge use by goshawks is non-random, and whether gender affects edge use. This study will help managers understand goshawk habitat needs, which is important for protecting the species and for making decisions on multiple use and management of forests.

STUDY OF ENGLISH LANGUAGE LEARNERS WITHIN A MAINSTREAM SECONDARY CLASSROOM

Jaimee Gillon

Mentor(s): Marilyn Wilson (English)

The purpose of this research was to gain a better understanding of English Language Learner (ELL) students' experiences and the additional challenges they face within a mainstream classroom. In regards to teaching I explored teaching strategies currently employed to aid ELL students and additionally generated new strategies that can be implemented in future classrooms to provide needed support for ELL's learning needs.

In order to conduct this research I observed two ELL students as they participated in mainstream classes, took notes based on my observations, was in frequent conversation with the teacher, examined previous research on similar topics, studied aspects of their completed work, and conducted short interviews with willing students to gain more knowledge about the intricacies of their learning experience.

INTRAMOLECULAR ASYMMETRIC HYDROAMINATION OF AMINOALKENES

Kevin Gipson

Mentor(s): Dr Aaron L Odom (Chemistry)

Asymmetric hydroamination of aminoalkenes is an efficient and atom-economical process to produce enantiomerically pure pyrrolidines. Pyrrolidines are important from a pharmaceutical perspective. We have synthesized a new chiral ligand by the condensation reaction between 2, 2'-diamino-1-1'-binapthalene and 2-formyl-5-mesityl pyrrole. The catalysts are made by reacting the chiral ligand with TiCl4 or ZrCl4. Currently, we are in the process of probing the activity of these two catalysts. We are also looking at ways to generate cationic complexes for use in asymmetric hydroamination reaction.

DEVELOPMENT OF AN EARLY GENERATION TEST FOR COMMON SCAB OF POTATO USING HYDROPONIC NUTRIENT FILM TECHNOLOGY

Calvin Glaspie

Mentor(s): David Douches (Plant Breeding and Genetics)

Using potato cultivars Liberator (MSU) and Atlantic we will develop a procedure to culture potatoes in a hydroponic system to infect and cause disease on their tubers produced. Using a nutrient film technology system (NFT), potato plants will be grown under artificial lighting and supplied with a standard nutrient solution to support tuber growth and development.

Once stolons on the plants begin to form, through different methods of inoculation, the tubers will be infected with Steptomyces Scabies so that we will be able to observe the infection of tubers to quantify the susceptibility of the potato to the bacterium.

TEXTURAL ANALYSIS OF COOKIES WITH INCREASING PERCENTAGES OF CRANBERRY BEAN FLOUR

Nicole Goldman

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

The removal of gluten from baked goods causes the texture of the products to suffer. The objective of this study was to determine how increasing percentages of gluten-free flour impact the structure of cookies. Extruded cranberry bean flour, which is gluten-free, was incorporated into sugar-snap cookies, a recipe based on the AACC micro method for cookie flour evaluation. Four different samples were made: 0%, 10%, 20%, and 30% cranberry bean flour. Twelve panelists were subjects in a consumer texture profile test, evaluating each of the samples on sixteen different textural characteristics. Samples were evaluated on a six-point hedonic scale (1 = not at all, 6 = very much so). Significant differences were noted in cookie crispness with 0% and 10% cranberry bean flour being chosen as the crispiest samples. The cookies with 0% cranberry bean flour scored

over one point higher than the 30% sample in as being “good”, but the 30% sample scored one point higher in density. As the cranberry bean flour percentage increase, consumers liked the cookies less, meaning that increased density and reduced crispness could be associated with an overall less enjoyable cookie. This information can be used to reformulate cookies with increased bean flour percentages that will mimic the crispness and density of the preferred wheat flour cookies, thereby improving texture.

THE ROLE OF TLR4 IN OZONE-INDUCED LUNG INFLAMMATION

Katherine Gonzales

Mentor(s): Alison Bauer (PDI, CIT)

Ozone (O3), a harmful pulmonary toxicant, causes numerous detrimental health effects including chest pain, congestion and worsen symptoms of asthma. We previously identified the innate immunity gene toll-like receptor 4 (Tlr4) as a susceptibility gene for O3-induced lung hyperpermeability. C3H/OuHeJ mice (OuJ; Tlr4 sufficient) are significantly more susceptible to O3-induced hyperpermeability and inflammation compared to coisogenic C3H/HeJ mice (HeJ; Tlr4 dominant negative mutation). In the current study, we hypothesize that strain background may influence the role of TLR4 in O3-induced lung inflammation and hyperpermeability. We exposed the BALB/c and OuJ (Tlr4 sufficient) and the HeJ and BALBLsp-d mice (Tlr4 dominant negative mutation) to continuous 0.3 ppm O3 or air for 6, 24 and 48 hours. Bronchoalveolar lavage (BAL) was used to assess the inflammatory infiltrates in the lung in the BALB and BALBLsp-d mice. Molecular analyses, both mRNA and protein, were done in all four strains (Th1, Th2, and pro-inflammatory cytokines). We found that in the BALBLsp-d mice there was an increase in neutrophils (PMNs) and protein content, reflecting hyperpermeability, after the 48 hr continuous O3 exposure compared to the BALB mice. The mRNA expression of Il13 increased in the OuJ, HeJ and BALBLpsd mice. We also saw marked increases in the expression of Tnfa and Il12 in the OuJ mice and Il12 in the BALB mice. These studies demonstrate that strain background contributes to TLR4 signaling. Future studies will further examine the IL13 pathway in relation to TLR4 signaling.

EVALUATION OF GENE EXPRESSION IN INDUCTION OF ADIPOGENESIS: COMPARISON OF ADIPOGENESIS IN HUMAN AND CANINE MESENCHYMAL STEM CELLS

Megan Goodall

Mentor(s): Vilma Yuzbasyian-Gurkan (Micobiology and Molecular Genetics)

Understanding the process of adipogenesis is critical to the study of diseases related to energy metabolism and obesity. Mesenchymal stem cells (MSCs) offer an excellent experimental model system to explore the adipogenic process. Comparative studies provide a special window to the mechanistic basis of adipogenesis. Our lab has successfully isolated and extensively characterized MSCs from both human and dog adipose tissues. Our earlier studies have revealed the differences in the effectiveness of different induction regimens between these two species. This study was undertaken to assess the species-specific differences in terms of expression of a panel of genes important in adipogenesis: CEBP alpha, PPAR gamma, FABP4, LPL, and Leptin. Both human and canine MSCs were divided into following six experimental groups: 1) Control in high glucose DMEM + 5% FBS 2) RDI (Rosiglitazone, Dexamethasone, and Insulin) + 5% FBS 3) RDI + Linoleic acid + 5% FBS 4) RDI + 5% Rabbit Serum 5) Linoleic acid + 5% FBS and 6) IDII (Indomethacin, Dexamethasone, Insulin, and IBMX) + 5% FBS. Primers for each target gene have been designed and validated. Quantitative RT-PCR is being carried out to evaluate the pattern of gene expression across each treatment group between the two species. This study will elucidate the role of different inducing agents on gene expression and differentiation of MSCs into adipocytes.

THE ROLE OF THE SMALL GTPASE, CDC 42, IN THE ACTIVATION OF MIXED LINEAGE KINASE 3 THROUGH ITS INTERACTION WITH THE CDC42/RAC INTERACTIVE BINDING MOTIF

Ramy Goueli

Mentor(s): Kathleen Gallo (Physiology and Biochemistry)

Mixed-lineage kinases (MLKs) are mammalian protein kinases that play critical roles in mitogen-activated protein kinase (MAPK) signaling pathways. MLK3 is activated through the disruption of an autoinhibitory interaction through the binding of the small GTPase, Cdc42. Our lab has shown that the binding of Cdc42 requires a Cdc42/Rac Interactive Binding (CRIB) motif, and through binding will trigger the subsequent activation of MLK3. Similar to other Cdc42 effector proteins, MLK3 binding requires additional amino acids surrounding the CRIB motif to initiate binding. It is after the binding is initiated that the Cdc42 then ‘rolls’ thus altering the protein conformation leading the disruption of the autoinhibition of MLK3. Through investigating these

flanking sequences, three Arginine residues (Arg512, Arg513, and Arg514) seem apparently important, which may serve to dock Cdc42. To investigate the interaction of these Arginine residues with Cdc42, we will perform mutagenesis on these residues mutating them to Alanines and then to Glutamic Acid residues. We will then transfect these mutated MLK3s into an inducible cell lines and perform western blots to determine the activity of MLK3's downstream targets (MEK1/2, JNK, ERK, p38, etc.). Through our experimenation we hope to find that by mutating these residues we will completely disrupt the interaction between MLK3 and Cdc42 thus keeping MLK3 in its autoinhibited conformation making it unable to signal its downstream targets.

INVESTIGATING POSSIBLE MOLECULAR MECHANISMS FOR THE REGULATION OF ANGII AND ITS ROLE IN IDIOPATHIC PULMONARY FIBROSIS

Keara Grady

Mentor(s): Bruce Uhal (Physiology)

Idiopathic Pulmonary Fibrosis (IPF) is an interstitial lung disease affecting 50,000 Americans annually. An early critical step in IPF pathogenesis is the apoptosis of Alveolar Epithelial Cells (AEC), which then activate synthesis of Angiotensin II (ANGII) and increase fibrosis by a mechanism not yet well described. Known IPF-inducing agents have been observed activating transcription of the ANGII precursor angiotensinogen (AGT) and its conversion to ANGII, an essential pathogenic component. Conversely, agents that down regulate the ANGII system evidently inhibit AEC apoptosis and decrease fibrotic activity. It is therefore believed that localized increase of ANGII in the interstitial lung cells, whether caused by profibrotic agents or the apoptosis of nearby AECs, is a significant factor in the pathogenesis of pulmonary fibrosis. Current experiments involve use of shRNA to give cell-type-specific knockdowns of Angiotensin-converting Enzyme 2 (ACE-2), which degrades ANGII to ANG1-7, a peptide that antagonizes the profibrotic effects of ANGII. We have begun to study the relationships between ANG1-7 receptor (mas) expression and ANGII. Preliminary experiments suggest that ANG1-7 decreases ANGII receptors in mouse lung epithelials, and when mas blockers are added in addition to the ANG1-7 ANGII receptors return to normal levels, suggesting a possible mechanism of action. The current goals of this lab involve using this information to determine the mechanisms for regulation of the ANGII system and the profibrotic influence of apoptotic AECs, with the ultimate goal of producing adenoviral vectors to prevent and possibly reverse pathogenesis of IPF.

MAGIC VIA MOTION TRACKING: A PROJECT FOR THE CHICAGO HISTORY MUSEUM

Nathan Graham

Mentor(s): Dan Marsh (Telecommunications)

This project was created as an impetus for a more developed piece to be used by the Chicago History Museum. The exhibit this piece was created for revolves around the theme of "magic". Extending this idea, this piece will utilize video motion control, optical and aural sensors, and proximity sensors, to create a playful and magical experience for children and patrons alike. Using an infrared wand, museum patrons will be able to interact via these sensors, pulling virtual rabbits and other objects from a physical hat. These virtual objects will be displayed on a screen beyond the patron. Other actions with the wand will create similar magical interactions, which will be projected as well.

PURIFICATION AND CRYSTALLIZATION OF THE NEISSERIA GONORRHEAE PROTEIN NG1684

David Grindem

Mentor(s): Dennis Arvidson (MMG)

While the exact function of the protein encoded by NG1684 is unknown, deletion mutants show a decrease in adherence to host epithelial cells. A region of the protein's amino acid sequence has amino acid sequence similarity to an enzyme in the queuosine biosynthetic pathway in Escherichia coli and Bacillus subtilis. Research conducted in the laboratory of Dr. Cindy Arvidson has shown NG1684 is upregulated in response to host cell contact and has identified that NG1684 is transcriptionally regulated by the FarR protein that also regulates farAB, which encodes an efflux pump that confers resistance to host derived long chain fatty acids. My focus is on crystallizing the NG1684 protein to solve its structure by x-ray crystallography. I have transformed E. coli with an expression plasmid that carries the gene for NG1684. The expression vector I used adds a histidine tag fused to the N-terminus for protein purification. The histidine tag is cleaved using a TEV restriction site to yield native protein for crystallization. Current screens of NG1684 show small crystalline structures. These promising conditions are being varied along with protein concentration to produce larger crystals suitable for determination of the protein's structure.

GENE HUNTING TO LOCATE GENETIC MUTATIONS LEADING TO CANINE PROGRESSIVE RETINAL ATROPHY

Amy Gruber

Mentor(s): Simon Petersen-Jones (Small Animal Clinical Sciences)

Progressive Retinal Atrophy is disease which leads to blindness in dogs. The disease is most commonly inherited as an autosomal recessive trait. The mutations which have lead to the disease have happened independently in many breeds meaning that a different test for the disease has to be found for each breed. This study looked at ten different breeds and compared the genome of affected dogs to that of unaffected dogs and carriers of the disease. The aim of this study was to find the genetic mutation that has led PRA in the ten different breeds and develop a test to locate those dogs in the population which are affected or carriers of the disease.

EVOLUTION OF INVASIVE SPECIES IN THE GREAT LAKES

Brittany Gunther

Mentor(s): Andrea Jaeger Miehls (Fisheries and Wildlife), Andrew McAdam (Fisheries & Wildlife), Scott Peacor (Fisheries & Wildlife)

We all know that invasive species pose a great threat to ecosystems; however we know little about their evolution. Bythotrephes longimanus, in the Great Lakes, provide a good opportunity to study evolution in invasive species. The main objectives in this study included looking at changes in tail spine morphology and quantity-quality strategy throughout the growing season. It was predicted that tail spine length should increase throughout the growing season due to gape-limited predation. As a result of fish predation increasing during the summer, one would expect that clutch sizes would decrease as the size of young would increase. This may offer protection from gape-limited predation. As expected, statistically notable trends have been observed in Bythotrephes in regards to spine length. Between the months of July and September the tail spine length shifted from a mean of (± 1 SE) of 4.98 ± 0.09 mm to 6.26 ± 0.05 mm. Also, it was found that clutch size underwent significant reduction over the course of the growing season. Visual inspection revealed an inverse relationship between clutch size and physical size. These results expand our knowledge of the evolution of invasive species.

WE'RE IN THIS TOGETHER

Kyle Haan

Mentor(s): Amol Pavangadkar (Journalism)

"We're in This Together" is a documentary video that considers how and why environmental issues are viewed differently in different parts of the world. The video contains several interviews, including students and professors.

THE EFFECTS PACKAGING AND STORAGE LIFE HAVE ON THE ANTIOXIDANT CAPACITY OF MICHIGAN GROWN ASPARAGUS

Danielle Habitz

Mentor(s): Kirk Dolan (Food Science and Biosystems Engineering)

Fresh Michigan asparagus was stored in two different packaging types for up to 21 days at a temperature 4°C to determine the effects that aging and packaging have on antioxidant capacity. The antioxidant capacity was measured using the oxygen radical absorbing capacity (ORAC) assay. The two different types of packaging used were Dupont® Modified Atmosphere Packaging (MAP) and Cryovac® Vacuum Skin Packaging (VSP). Cryovac packaging was found to have an overall higher antioxidant capacity than the Dupont packaging type. Within both packaging types an overall increase in antioxidant capacity was found as the asparagus samples aged up to 21 days.

LADYBUGS

Sara Hawes

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

Whether you refer to them as ladybugs or ladybirds, people always know what bugs you are talking about. Ladybugs are commonly seen as a nuisance or pest, but they can be very interesting up close. By using pictures from a scanning electron microscope, I show the unique, and commonly never-seen parts of a ladybug.

GEOGRAPHIC RACIAL EQUALITY IN KENTUCKY

Lauren Hayes

Mentor(s): Joe T Darden (Geography)

Prior research has demonstrated that among blacks and whites, there have been steady trends of racial disparities in income, occupation, education, and residential location. This paper examines these socioeconomic and residential factors and determines to what extent there are municipalities in the state of Kentucky that have achieved geographic racial equality, rather than inequality, between blacks and whites. It was hypothesized that at least one municipality in Kentucky would have achieved geographic racial equality. Data was obtained from the 2000 U.S. Bureau of the Census Summary File 4. The methods used to determine geographic racial equality were ratio comparison and the index of dissimilarity. A simple ratio comparison was used to compare the socioeconomic status of blacks and whites in the areas of income, occupation, and education. The index of dissimilarity was employed to compute the amount of segregation between blacks and whites in the municipality based on census tracts. The results revealed that one place, Shively, proved to have achieved racial parity in each component of geographic racial equality. The index showed that residential segregation between blacks and whites in Shively remained relatively low (below 50%) while both groups maintained a similar socioeconomic status.

ARTS OR CRAFTS

Evan Heiss, Mike McLaughlin, Alex Priebe, Brian Wood

Mentor(s): Bob Albers (Telecommunication)

Director Rob Roznowski, from the Department of Theatre, explores the differences and similarities between Art and Craft as he discusses Michigan State University's Year of Arts and Culture. This short documentary takes a look at the creation of the play Arts or Crafts.

SIDESHOW

Evan Heiss, Anthony Siciliano

Mentor(s): Bob Albers (Telecommunication)

Sideshow is a sketch comedy television show here at Michigan State University. As part of the MSU Telecasters we are 100% student run with producers, directors, writers and actors.

ANALYSIS OF THE EFFECTS OF SUBSTITUTION OF SORGHUM AND CASSAVA IN BREAD PRODUCTION

Amy Hendricks

Mentor(s): Maurice Bennink (Food Science and Human Nutrition)

The high cost and relative inaccessibility of wheat in Tanzania make bread production expensive. The objective of this research was to determine the greatest proportions of different grains that could be substituted into a white bread recipe to minimize wheat usage while maintaining acceptable visual appearance and taste. The resulting data will assist faculty at the Sokoine University of Agriculture in Morogoro, Tanzania as they work to reduce the cost involved in bread production. Sorghum and cassava, two prevalent and relatively inexpensive crops in Tanzania, were substituted for white bread flour in proportions ranging from 5-25%. Loaves were analyzed for density, height, texture, and taste. As the amount of wheat flour in the recipe decreased, loaves were shorter, denser, and had a firmer texture. Substitution of sorghum noticeably changed the color of the inside of the loaf from white to grey. Although loaves with the greatest fractions of sorghum and cassava varied in taste from the control, they were still acceptable to eat. Extended research will involve the formation of a table with data for the aforementioned variables as sorghum and cassava substitution increases. This information will be useful to Tanzanian researchers as they choose the most favorable composition for bread production. Increased substitution of sorghum for white

bread flour also improves the nutritional quality of the bread; these improvements can be actualized and can ultimately serve to improve the dietary intake of bread-consuming Tanzanians.

TIME-RESOLVED PHOSPHORESCENCE DETECTION OF PROTEIN DYNAMICS

Ryan Hendricks
Mentor(s): Lynmarie Posey (Chemistry)

Laser excitation of the Q- and Soret-band absorption transitions of the intrinsic porphyrin chromophore in Zn(II)-substituted cytochrome c (ZnCytc) leads to conformational changes in the protein that are reflected in the emission spectrum which evolve over time. When sufficient energy is provided in excess of the Q-band 0-0 transition energy, partially unfolded states of the protein are accessed. Previous time-resolved studies of the dynamics of these states have been limited to the ps to 2-ns timescale. A new instrument has been constructed to follow the unfolding and refolding dynamics of ZnCytc from 20 ns-20 ms by monitoring the evolution of phosphorescence and delayed fluorescence spectra over time. This instrument will be described and preliminary time-resolved phosphorescence measurements will be reported for ZnCytc.

NON-LETHAL SAMPLING: CAN FISH FIN TISSUE PROVIDE RELIABLE STABLE ISOTOPE DATA

Jan-Michael Hessenauer
Mentor(s): Mary Bremigan (Fisheries and Wildlife)

Analysis of stable isotopes ($\delta^{13}C$ and $\delta^{15}N$) of fishes in freshwater lakes provides a wealth of information on lake food web structure and function. Historically muscle tissue has been used for stable isotope analysis on fish; however, muscle tissue is rather difficult to collect in the field and leaves the animal at risk of infection. Alternatively, fin tissue is easier to collect in the field and poses less risk of infection to the animal. The purpose of this research is to determine if caudal fin tissue can provide reliable data for stable isotope analysis instead of muscle tissue, in a variety of sunfish species and yellow perch (*Perca flavescens)*. Whereas other studies have found positive correlations between the isotopic signatures of scales and muscle tissue in sunfish, there has been little if any comparison between fin and muscle tissue in these fishes. Our initial results from last spring were promising, but sample sizes were too small for significant trends to be identified. This year we have substantially increased our sample size, and results from the isotopic analysis of these new samples will be available in mid-March. While the species that we are working with are not threatened or endangered it is still desirable to minimize the risk to the animals as much as possible. In addition, our project holds much potential for those who are working with threatened and endangered species.

CHEVRON'S TRIPARTITE RELATIONSHIP WITH NIGERIA'S FEDERAL STAKEHOLDERS

Alex B. Hill
Mentor(s): Rita Kiki Edozie (James Madison College)

Conflict over the oil resource in Nigeria is not a problem that can be over-simplified to a single-issue. The problem is complex and cuts across issues of violent unrest, environmental degradation, and democratic representation in the Niger Delta. These issues within the oil conflict encompass historical, political, economic, and social spheres where effects can be seen at the local, state national, and international levels. The conflict over oil is largely fueled by the corporate interests and actions of Western oil companies. With over 80% of the Nigerian state revenue being supplied by oil exports to foreign countries, the US leading, it is not difficult to identify one of the driving factors of Nigeria's oil conflict. Chevron and its subsidiaries have held a presence in Nigerian oil production since the Gulf Oil Company's first off-shore mining at Okan conducted in 1963. While Chevron claims to funnel a significant amount of resources back into the communities of Bayelsa State there have been frequent kidnappings and attacks carried out by citizens and militants displeased with the environmental degradation and distribution of the oil wealth. Chevron, among other oil corporations, has been accused of exploiting local rivalries and ethnic differences as well as assisting the government in carrying out raids on communities hostile to Chevron's presence.

LIVIN THE MACLIFE: A STUDY IN REBRANDING

Rachael Hodder

Mentor(s): Danielle Devoss (Professional Writing)

In this presentation, I evaluate the recent brand realignment of the Future US, Inc. publication "MacAddict," known today as "Mac|Life." My evaluation assesses both magazines based on a visual analysis of three magazine conventions—logo, cover design, and table of contents. A comparative analysis of these conventions highlights the fundamental differences between "MacAddict" and "Mac|Life." Each magazine attempts to appeal to a specific set of consumers using distinctly different styles of representing the Apple brand and Mac users. The primary difference between the two is each publication's focus: "MacAddict" focused on technology—for instance, the Oct. 2006 cover features a Power Mac with its insides exposed seductively for the Mac addict's gaze—whereas "Mac|Life" is a lifestyle magazine providing readers with hints and tips for integrating Mac into their daily lifestyle (e.g. May 2007 headline: "40 ways your Mac can improve your life"). I conclude that "Mac|Life" is an effective redesign which aligns the publication more closely with Apple's own brand identity. At its core, Future's rebranding of their Mac-centric publication illustrates the way that Apple's brand identity has shifted from nerdy, niche brand to being the standard of coolness in consumer electronics today. The juxtaposition of Apple products with lifestyle topics in "Mac|Life" illustrates the way that technology has become more than just a tool, but, veritably, a way of life.

CHILDREN'S COMPREHENSION OF THE FUTURE

Marie Hollenbeck, Thao Dinh, Megan M. Sutton

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

English has two ways of expressing the future: 'will' and 'going to' ('gonna'). Although similar in meaning, the two forms behave differently in certain contexts: 'will' has an implicit condition attached to it whereas 'gonna' seems to be a simple future. Previous research on children's early production of 'will' and 'gonna' have found that 'gonna' is produced more frequently and earlier than 'will'. This data suggests that children learn 'will' later than 'gonna'. In the present research we test this hypothesis directly by using an elicited production task, in which children are told stories accompanied by pictures and are asked to explain some future aspect of the story which would require them to produce either 'will' or 'gonna' depending on the context. We predict that children will produce 'gonna' correctly at an earlier age than 'will', and will be better able to produce 'will' in contexts in which the implicit condition that 'will' requires is made explicit.

THE ECONOMICS OF TICKET SCALPING

Jeffrey Holycross

Mentor(s): Ronald Fisher (Economics), Carl Liedholm (Economics)

Many sports fans have participated in the secondary market for sports tickets. For a long time, ticket scalpers were objects of scorn among fans, franchises, and legislators, but economists believe that scalpers play a very important role in the ticket market and that ticket resale should not be regulated at all. I examined economic aspects of the secondary ticket market and witnessed the dynamics of the market firsthand when I scalped tickets at the Michigan State - Penn State football game on November 17, 2007.

CAN PERCEPTIONS LEAD TO PURCHASE

Christine Honer

Mentor(s): Constantinos Coursaris (CAS)

In previous research, Song, Fiore, and Park (2007), along with Wang, Baker, Wagner, and Wakefield (2007) showed support for the relationships between socialness and its effects on pleasure, arousal, and purchase intention. However, this combination is unique when also considering the effects on usability and how usability can effect pleasure, arousal or purchase intention. Shopping on the internet can affect consumers according to how they perceive their environments and their interactions with it. In the future, as the web becomes more versatile, companies are more concerned with pleasing the customer on the internet as they would be able to in a real world shopping experience. This study would benefit the websites that are aimed towards retail consumers and how to develop their websites to create increased patronage. By changing the look or model of the site, you would be able to alter the perceptions Also, it will provide feedback for expanded knowledge of the interaction between consumer and virtual environment.

A STITCH AHEAD: EXAMINING THE PROPERTIES OF ETHICON, INC. SUTURES USING SCANNING ELECTRON MICROSCOPY

Chelsea House

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

From the stand point of a medical doctor, understanding the properties of the products they use on a day to day basis is one of the most important pieces of information that can determine the health and happiness of their patients. One of the most common outpatient procedures performed today is the stitching together of any tissue, external or internal, in the human body that has been severed either through injury or surgery. The sutures used for these procedures can have a variety of compositions, each of which allows them to demonstrate different structural properties making them suitable for use on specific types of wounds. One of the leading developers and manufacturers of sutures, Ethicon, Inc., produces their trademarked ETHILON nylon suture, their coated polyglactin braided VICRYL suture, as well as their black, silk braided suture, three very different products in terms of their material composition. Their structures were examined on the microscopic level using scanning electron microscopy (SEM). The resulting photomicrographs of each product were then directly compared and the results analyzed in order to offer a means of explanation for why certain sutures are chosen over others in a given time and place.

INVERSION AND HYDROGEN EXCHANGE IN 1,2-CYCLOPENTANEDIOLS: A GEOMETRICALLY CONSTRAINED MODEL FOR AQUEOUSPHASE GREEN CATALYTIC CARBOHYDRATE HYDROGENOLYSIS

Darya Howell, Dena Palasik

Mentor(s): James Jackson (Chemistry)

The chemical refinery of the future will begin with renewable carbon feedstocks mainly plant-derived carbohydrates. These materials differ fundamentally from today petroleum-based starting points. Particularly promising are the carbohydrate-like targets ethylene glycol, propylene glycol, and glycerol produced from biomass-derived carbohydrates (general formula R(CHOH)nR') via aqueous-phase hydrogenolysis. In the presence of a transition metal catalyst, cleavage of C-C and C-O bonds occurs via retro aldol and elimination reactions in hydroxyketone intermediates that arise via CHOH to C=O dehydrogenation. Our goal understanding how the reactions are affected by a neighboring –OH group, positioned on either the same or the opposite ring face as the C-H under attack, and to quantify the kinetics of such reactions. To probe functional group interactions and their effects on the geometrical nature of catalyst-bound intermediates, we have chosen to study two simple substrates with opposite stereochemical relationships: the cis and trans 1,2-cyclopentanediols.which isomerize and incorporate deuterium when treated with 1000 PSI H2, a Ru catalyst, and heat. Cyclopentanol incorporates deuterium in equivalent circumstances, providing a simpler molecule for a control variable. The rate of both deuterium incorporation and isomerization can be quantified using HPLC, NMR, and GCMS. A 2:1 equilibrium of trans to cis 1,2-cyclopentanediol is reached at all experimental temperatures. For 90°C and a starting substrate in trans form, the rate of the forward isomerization reaction is 2.34x10-4 M-1s-1and the rate of the reverse reaction is 4.80x10-4 M-1s-1. Similar values are found starting with purified cis diol. Rates increase with increasing reaction temperature.

MEDITATION

Mark Hsieh

Mentor(s): Ava Ordman (college of music)

My project will be an unaccompanied bass trombone solo.

INTERVIEWS WITH INFORMATION GRAPHICS LEGENDS

Rebecca Hughes

Mentor(s): Karl Gude (Journalism)

The project consists of a series of several short video interviews with Information Graphics Legends Richard Curtis and George Rorick. The videos combine interviews with Information Graphics and images relating to the subject matter.

THE INTEGRATION OF NATURE INTO DESIGN

Matthew Hull

Mentor(s): Jon Burley (Landscape Architecture)

Sustainable design has emerged as one of the hot topics of the 21st century. More and more design professions are seriously considering sustainable design solutions in their design approach. This project required ecological sensitivity while maintaining a high degree of aesthetic creativity in developing a residential lot on Rainbow Lake, Gratiot County, Michigan. A study of the site conditions and characteristics provided the foundation for site development while the client's wants and needs provided the framework for the over all design. The project focused on creating a residential site that catered to human requirements while maintaining a strong connection to song birds. The primary objective of the design was to develop a strong relationship between the house and the landscape through the form of birds in flight.

THE IMPACT OF 1-METHYLCYCLOPROPENE (1-MCP) ON ETHYLENE INVOLVED GENE EXPRESSION IN APPLE

No-Ya Hung

Mentor(s): Randy Beaudry (Horticulture)

Ethylene, the plant hormone, is involved in various stages of plant life cycle, like seed germination, flower senescence, and fruit ripening. Studies have found in apples, ethylene plays a major role in the ester production which is the key contributor to apple's aroma when the apple ripens. 1-methylcyclopropene (1-MCP) has been identified to be an effective ethylene antagonist that delays apple ripening. Beaudry and coworkers showed that ester production is reduced by ethylene inhibition in 1-MCP treated apple fruit. However, the changes in gene expression that been affected by ethylene in ripening apple fruit is yet unknown. To assess ethylene's effects on gene expression in ripening apple, we are going to compare the gene expression of 1-MCP treated and non-treated apples by using microarray. The results will help commercial needs to develop markers for 1-MCP treatment. Furthermore, the gene expression identification could contribute to our understanding of ethylene involvement in various plant pathways and 1-MCP's effects on apple development during ripening.

ART TRANSFORMATION

Jeromy Hunt, Kristin Fulgoni, Lauren Glinke, Andy Huber, David Twigg

Mentor(s): Kirk Domer (Theatre), Rod Nelman (Voice)

Music through the ages. A conceptual layout of how performance art has changed throughout civilization. The underlying theme of productions used is continuous throughout the time line of performances.

PERSONALITY AND SLINKIES

Michael Hunter

Mentor(s): Ryan Bowles (Psychology), Bret Donnellan (Psychology)

In this presentation, we will examine an argument for why certain aspects of personality should behave like a slinky. Then we will assess the accuracy of this prediction by using an empirical data set which was collected from 10 MSU undergraduates over approximately 21 days. Finally, we shall discuss some implications of the relative success or failure of this theory; along with future possibilities for investigation.

COMMUNITY BASED RESEARCH FOR MEDICALLY UNDERSERVED WOMEN

Netali Ish-Hurwitz, Allison Austin, Lauren Brown, Lizabeth Giles

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

Background: Studies have shown there is a strong correlation between cervical cancer literacy and preventive cervical cancer screening among medically underserved women. Objective: The aim of our study is to investigate cervical cancer literacy among medically underserved women. This information can be used to increase rates of cervical cancer screening through cervical cancer education. Methods: Utilizing data collected through the Kin KeeperSM model, we compared scores from a Cervical Cancer Literacy Assessment taken by 31 community health workers prior to and after an educational intervention. We computed descriptive statistics (frequencies and cross tabulations with Chi-square tests) using the statistical software, SPSS. To avoid biased results, we used complete case analysis technique to account for three missing cases. We focused on two true or false questions: (1) A woman is at risk for getting cervical cancer if she has unprotected sexual intercourse, and (2) If your

mother had cervical cancer, you are at risk for getting cervical cancer. Results: After the educational intervention, the percentage of women who answered the first question incorrectly decreased from 50% to 3.6%. Results for the second question were not as dramatic; the percentage of incorrect answers only decreased from 71.4% to 60.7%. In the first question, 85.7% of Latina women answered incorrectly whereas in the second question, over 75% of African-American and Arab-American women answered incorrectly. Conclusion: The Kin KeeperSM model was successful in increasing cervical cancer literacy among medically underserved women. Our hope is that this increased literacy will lead to improved screening practices.

BEING ARAB AMERICAN SINCE 911

Michael Jordan

Mentor(s): Robert Albers (Telecommunication)

Since 9-11 there have been many changes--mostly negative--for the Arab American Community in Dearborn Michigan. Working with Bob Albers and Geri Zeldez on the production of a full-length documentary, I will create a production-related wiki, a project website, and work on the rough editing of at least one portion of the documentary. Additionally, there will be a need for some research and participation in the shooting of interviews and illustrative material.

Since there are ten people involved in the production, the wiki will serve as a means of collaboration and communication to facilitate the production process. The website will operate alongside the documentary, acting as a window into the production process and the development of the story. Additionally, I will be producing a rough edit of a segment discussing the history of media portrayal of Arabs and Arab-Americans.

COMPOSITION OF SEASHELLS

Rachel Kamish

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

Images of seashell samples captured using a Scanning Electron Microscope were compared and researched to determine their composition and properties.

STUDY OF HOUSEHOLD PLANT LEAF STRUCTURE USING SCANNING ELECTRON MICROSCOPY

Karla Kapplinger

Mentor(s): Carl Boehlert (Engineering)

This study explores the physical structure of common household plant leaves. The leaves of three species of plants are examined under high magnification using scanning electron microscopy. The species included in the study are Saintpaulia ionantha (African Violet), Chlorophytum comosum (Spider Plant) and Aechmea fasciata (Silver Vase Bromeliad). The physical characteristics and functions of these surface structures are studied. A description of SEM and its purpose in analysis are discussed.

SOFTWARE PATENTABILITY AND THE EVOLUTION OF PATENT LAW

Timothy Kaufmann

Mentor(s): Edward Jocque (History)

The paper to be presented deals with the evolution of patent law, up to the point of time in which computer software was first found to be patentable. Then an exploration of the applicable case law will be carried out, finally ending with what appears to be the directions in which patent will most likely head in the near term.

THE TRANSMISSION OF REGIONAL VOCABULARY ACROSS GENERATIONS IN SOUTHEASTERN FRANCE

Sarah Kaye

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

This study examines the transmission of regional French vocabulary among generations within families in Briançon, a small town in the south of France. The goal of this study is to observe what factors may cause differences in transmission and to determine which are more important. For this, a questionnaire containing 226 regional words was established, asking informants if they knew each word, and if so, to give a definition. 49 informants form 19 different families. While each individual was born and resided in Briançon, their backgrounds, including their level of education, familial origin and occupations, varied greatly. Among important factors, the origin of the parents shows an interaction with gender: the origin of

the mother plays a much larger role in determining the level of transmission than that of the father. The education level of informants is also shown to have an impact: in general, the results show that those with a higher level of education know fewer words than those without a diploma or some form of higher education. Based on a fairly large questionnaire and sample of families, some conclusion emerge. First, the rate of transmission of regional vocabulary seems relatively stable among generations, regardless of the age of the informants. However, the importance of historical events and social factors may influence such transmission. Indeed, social factors such as gender, the origin of the parents, and education level also play a role in the transmission of regional vocabulary.

SEA SHELL STRUCTURE AND ELEMENTAL COMPOSITION

Amanda Keedle

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

In this research project, sea shells were collected from a beach in Florida, broken into pieces, and then mounted and gold-plated for use in the Scanning Electron Microscope (SEM). Looking at the shells with the help of the microscope will show the shell structure and the use of X-Ray techniques will allow the elemental composition to be evaluated.

SCORING FUNCTION: ASSESSMENT MEASURE FOR PROTEIN-PROTEIN DOCKING

Chong Kim

Mentor(s): Maria Zavodszky (BMB)

Different scoring functions have been developed to score protein-protein complexes, generated from protein docking programs, but their performance on ranking the docking predictions according to their distance from the correct complex for identifying the orientation nearest to the native bound state are still subject to improvement and refinement. In this study, we apply a statistical approach to diagnose the reliability of several scoring methods (ZRANK, ContextShape, and DFIRE) in finding the correctly docked protein conformations based on their scores. For each docking-program generated conformation, a new correlize score is calculated, which reflects how well the original scores correlate with the distances from a reference state, when the conformation in question is used as the reference state. These correlize scores can be interpreted as expected scores for each docking solution based on the scores of its neighbors. A high correlation between the original scores and the correlize scores indicates a reliable performance of the original scoring function. The range of correlize scores is also a good indicator of scoring performance, with wider ranges reflecting better performance. This method has been successfully applied to assess scoring function performance for protein-ligand docking. This approach is radically different from previous practice of evaluating scoring methods on several known test cases and calculating the percent of cases where a good solution is ranked the highest. Here, we evaluate scoring performance without any prior knowledge of the correct solution. This new scoring function assessment measure is expected to be a valuable tool for modeling protein-protein interactions.

MOLECULAR SYSTEMATICS OF THE BUTTERFLY GENUS SPEYERIA

Edita Klimyte

Mentor(s): Barry Williams (Zoology)

Elucidating the evolutionary history of organisms is central to many aspects of biology. However, for both analytical and biological reasons, evolutionary tree construction can be quite problematic. The goal of this study was to generate a robust phylogenetic hypothesis for a relatively unknown, but highly complex genus of butterflies, Speyeria. Speyeria is an exemplar group of organisms to study, because there are roughly 14 species and 120 subspecies found throughout much of North America; however, these estimates taxonomic delineations and patterns are only based on field observations of highly labile morphologic characters. There was no formal phylogenetic tree proposed for this group even though they are some of the most photogenic and charismatic butterflies in the world. The genes we tried to sequence in this study include: cytochrome oxidase subunit I (COI), cytochrome oxidase subunit II (COII), elongation factor-1 alpha (EF-1a), wingless (wgl), mannosephosphate isomerase (MPI), and triosephosphate isomerase (TPI).

CHARACTERIZATION OF THRESHOLD DEPENDENT ACTIVATION OF B LYMPHOCYTES BY LIPOPOLYSACCHARIDE AND ITS ROLE IN IMPAIRMENT OF THE IGM RESPONSE BY 2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN

Douglas Kline
Mentor(s): Robert Crawford (Pharmacology and Toxicology), Norbert Kaminski (Pharmacology and Toxicology)

The immune system, particularly the B lymphocyte, has been shown to be impaired functionally by the environmental contaminant 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) in mouse models. The immunosuppressive effect of TCDD requires the B lymphocytes to be activated with an activation stimulus such as lipopolysaccharide (LPS). Many common receptor-dependent cell stimulants require the attainment of a chemical signaling threshold in order for the effects to be induced. Therefore, we hypothesize that LPS activation of B lymphocyte differentiation into antibody-secreting cells must exceed a threshold concentration. Initial experiments will characterize LPS activation to establish whether activation occurs as a threshold dependent response or a simple linear response. In our lab we have typically used optimal levels of LPS to maximize the activation of the B lymphocytes and this intense activation may lead to a partial masking of the effects for certain immunosuppressants like TCDD. Because of this, we will also perform TCDD concentration response studies at the threshold level of LPS and at concentrations above the threshold to determine how the sensitivity to TCDD changes. In both series of experiments we will measure productive B lymphocyte activation by using a highly-sensitive enzyme-linked immunosorbent spot assay, or ELISPOT, to detect the downstream consequences of B lymphocyte activation, that being antibody secretion. The above investigation will provide important insights concerning the relationship between the magnitude of B lymphocyte activation and its role in sensitivity to immune suppression by B lymphocyte toxicants such as TCDD. (Supported in part by NIH P42E504911)

IMPACT OF EQUINE NUTRITION PRACTICES ON ENVIRONMENT

Vanessa Knight, Laura Balgooyen, Sarah Cline, Jessica Zalucha
Mentor(s): Nathalie Trottier (Animal Science)

Excessive amounts of protein in a horse's diet can result in increased levels of ammonia excretion, and in a country concerned with the environmental pollution arising from livestock operations, this gives rise to an important issue. This study aims to determine a nitrogen excretion profile from horses fed different levels of protein and examine the environmental impact of ammonia emissions, while ensuring the health of the horse. The specific objective of this group was to determine the impact of different levels of protein on nutritional status and overall wellbeing. Six Arabian geldings from the Horse Teaching and Research Center, selected for similarities in age, performance level, and size, were used for this study. Six two-week feeding periods consisting of six different dietary protein levels were established using a 6x6 Latin square design. Total fecal and urine output was collected during the last three days of each feeding period. Body weight and condition of each individual horse was monitored at the beginning of each feeding period to determine how diets containing different levels of protein affected health. As the study progressed, each horse moved from their original body condition score to an ideal score. This study is currently in progress, though initial observations suggest that large amounts of protein in equine diets do not adversely affect overall wellbeing; however, the environmental implications addressed by other members of this research seminar group are critical to the global assessment of dietary protein nutrition in equids.

KEEPING THE FUTURE BRIGHT: THE GREAT LAKES REGION

Carl Kondrat
Mentor(s): Amol Pavangadkar (Journalism)

A trip to around the Great Lakes region can be pretty powerful. In this film you will see a young college student (Carl Kondrat), travel across this region in order to acquire knowledge and change his perspective on how to sustain our environment. At first it was just a fun, much needed vacation. After a couple weeks he becomes more passionate about the subject. He begins to realize that there is so much that we can do in order to sustain our ecosystem, and there is such a small number of people doing anything to help out. While you watch this video, you will become aware of a wide range of information about the Great Lakes that will open your eyes to see just how beautiful it really is. Although the topics just scratch the surface of the major issues, you will be able to conceptualize quite a bit about water quality, air quality, pollution, habitat depredation, recycling, and other problem areas. When you are done you will hopefully respect and care at least a little more for our environment. Enjoy the soothing music that was written and inspired by this adventure. Gain a new found hope while you watch this emotional journey through the Great Lakes region.

ANALYSIS OF ARABIDOPSIS THALIANA NUCLEOTIDESUGAR NETWORKS, IMPLICATIONS IN CELL WALL BIOSYNTHESIS AND REGULATION

Kyle Korolowicz

Mentor(s): Markus Pauly (Plant Biology)

Plant cell wall synthesis is a complex and dynamic process that involves a myriad of molecular building blocks and contributive proteins. The plant extracellular matrix is primarily composed of polysaccharides formed in the Golgi apparatus from nucleotide sugar precursors. Our lab proposes that one way cells could regulate the formation of specific polysaccharides is through the development of protein complexes. These proteins would work together to channel nucleotide sugars into a polysaccharide forming in the Golgi. This system should consist of enzymes necessary for polysaccharide synthesis including a nucleotide sugar converter, nucleotide sugar transporter, and glycan synthase or glycosyltransferase. As a prerequisite for this hypothesis the protein components of this substrate channel should appear in the cell at the same time, which could be achieved by the transcriptional co-expression of the genes corresponding to these proteins. Currently genes of know or putative function in cell wall biosynthesis AtGAE, AtRHM, and AtUTR are being investigated to detect signs of transcriptional co-regulation as well as to confirm their involvement in the synthesis of pectic polysaccharide rhamnogalacturonan I (RGI). Better understanding of how cell wall formation is regulated will give insights into the mechanisms behind creating different cell types as well as variations across individual cells. With time and further research a more comprehensive view of the factors that control the construction of cell walls could lead to dramatic improvements in such industries as fuel ethanol production.

PERSONAL DEMOGRAPHICS IN RELATION TO INTERNATIONAL AFFAIRS KNOWLEDGE

Kara Krebs, Andrew Jelinek, Victoria Maynard

Mentor(s): Daniel Kramer (Political Science), Michael Schechter (International Relations)

We are comparing personal demographics, such as party affiliation, news sources, gender, and class level, with knowledge of foreign affairs in the MSU student community to determine how personal backgrounds correlate with knowledge.

A COLLABORATIVE MODELING APPROACH FOR COMPLEX BUFFERS AND THEIR PROPERTIES

Andrew Krieger

Mentor(s): Daniel Dougherty (Lyman Briggs School of Science)

The semi-mechanistic partial buffer (SMPB) approach provides a framework for modeling properties of complex buffers and has the attractive feature that it can be used even when the identity of many of the components within a buffer are unknown to the investigator. Our hypothesis is that the standard SMPB approach does not fully capture all important sources of variability when predicting buffer properties. In this study, we develop a database of experimental buffer data and give a detailed analysis using a new Bayesian extension of the SMPB approach. We generated experimental titration curves of defined and undefined bacterial growth media from multiple batch sources. We conclude from the statistical analysis of this data that multi-site and batch-to-batch variability in predicting buffer properties, previously ignored in the standard SMPB approach, are important. In addition, we conclude that statistical modeling of process variability including pH measurement and human error are essential. Lastly, we detail predictions using the fully Bayesian statistical approach in the context of a robust and internet-collaborative framework that may be useful for predictive risk modeling, industrial process optimization, and rational product design.

BERYLLIUM ABUNDANCES IN SOLAR MASS STARS

Julie Krugler

Mentor(s): Timothy Beers (Physics & Astronomy)

Light element abundance analysis allows for a deeper understanding of the chemical composition of a star beneath its surface. Beryllium provides a probe down to $3.5x10^6$ K, where it fuses with protons. In this study, Be abundances were determined for 52 F and G dwarfs selected from a sample of local thin disc stars. These stars were selected by their mass to be in a mass range of 0.9 to 1.1 as determined by Lambert & Reddy. The have effective temperatures from 5600 to 6400 K, and their metallicities [Fe/H] 0.65 to +0.11. The data were taken over several nights, with forty-six spectra taken with the Keck HIRES instrument and six spectra on the Canada France Hawaii Telescope using the Gecko spectrograph. The abundances were calculated via spectral synthesis, fitting a 4Å region around the resonance lines of Be II. The data were then analyzed to investigate the Be abundance as a function of age, temperature, and metallicity and its relation to the lithium abundance for this narrow mass range.

FIRE PROBLEM IN THE UNITED STATES

Srikanth Kumar

Mentor(s): Rustin Fike (Civil Engineering), Venkatesh Kodur (Civil Engineering)

Fire represents one of the most severe hazards encountered by built environment and hence building structures are to be designed for appropriate fire safety. The magnitude of the fire problem can be seen from the latest fire loss statistics. In 2006, 524,000 structural fires occurred claiming 2,794 lives and injuring almost 100,000 people, many of whom were first responders. The total economic cost of these fires was 9.3 billion dollars. Unlike earthquake or tornadoes that occur in specific regions, fires occur in each and every community around the world and thus represent a universal hazard. However, buildings are "designed (engineered)" against earthquake or tornadoes, they are protected against fire. This is mainly due to lack of research and development activity in fire safety field. Also, there have been very few educational and training programs in fire safety field at US colleges and universities. The significance of the fire problem will be illustrated in the proposed poster. Some of the probable reasons for the high loss of life and property will be discussed. The lack of research and training programs in fire area will be illustrated by comparing the current programs in fire area with those of other hazards. In addition, the magnitude of fire hazard is compared to other hazards faced by civil infrastructure. It will be demonstrated that fires pose greater problem than many other natural hazards. The need for research and training programs to minimize fire losses will be emphasized.

CASE STUDIES IN GLOBALIZATION: THE LIVES AND WORK OF MONA HATOUM AND YINKA SHONIBARE

Debbie Labedz

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

A college student living in Mumbai logs into MySpace.com and reads a message from a friend in England. A Navy family moves seamlessly from Guam to Pensacola, Florida to Naples, Italy to Virginia Beach, Virginia. Currency exchange booths sprinkle the streets of Paris. Dual citizenship, the United Nations, the construction of a Wal-Mart in Shanghai—this is globalization.

To put it simply, the term "globalization" refers to the fusion of ideologies, social customs, and businesses of countries from around the world. Globalization is an economic, political, cultural, social phenomenon that has swept the world since the genesis of its buzzword status in the 1990s. Supporters believe globalization provides a new avenue for business, politics, and mutlinationalism that will bring citizens of the world into an interwoven web of connectedness. Critics claim globalization merely widens the gap between the "haves" and "have-nots." Whether friend or foe to globalization, one belief seems universal--it's inevitable--an unstopable progression of society. This research project tackles the causes and consequences of globalization from the untapped angle---a cultural perspective. The connections between art and politics are explored further in this project. Globalization has had an inmeasureable impact on the Contemporary Art world. The lives and work of two artists in particular, Mona Hatoum and Yinka Shonibare, provide significant case studies for the impact of globalization on Contemporary Art.

THERMAL FOOT

Jeffrey LaForge

Mentor(s): Rodger Haut (Orthopaedic Biomechanics Laboratories)

The purpose of this study was to compare the thermal characteristics of different winter boots in a cold environment, with the ultimate goal of determining which boots would be most effective in keeping a person?s foot warm. The tests attempted to simulate a normal boot environment and human foot. A "thermal foot" was designed to go into the boots and measure the power required to maintain a temperature of 37°C, to simulate body temperature. The "skin" thermal foot consisted of a Gortex sock, which allowed humidity to pass through it, and was filled with water. Inside the sock a heating element was placed along the bottom of the foot, and at the top a pump motor was attached for water circulation. The temperature of the water inside the sock was maintained at 37°C through the use of an Omega controller. A watt meter, recorded the amount of power used by the heating element during testing. Each boot ran inside a freezer at -10°C for thirty minutes, the average power was calculated, and then used to compare the boots. An AutoCAD model of each size of shoe was made to calculate the surface area of each boot. With the surface area, the thermal conductivity was found by dividing the power by area. This allowed for a better comparison of each boot because larger boots would naturally loose more heat to the environment due to having a larger surface area.

VISUALIZING THE CHANGING FOOD SYSTEM

Adrienne Lagrou

Mentor(s): Philip Howard (Community, Ag, Recreation And Res Studies)

My research project is about the changing food system in the grocery industry in the United States. Growth and consolidation of the top 25 Grocers in the United States due to mergers and acquisitions, bankruptcy, and other practices are explored. To illustrate this new structure, I comprehensively mapped out the activity of these companies in the past 15 years. In addition, research compiled from business databases, news sources, and individual interviews with industry leaders allowed me to analyze new industry trends and make future projections. Through my presentation, I will explain what this means for the grocery industry, the food industry as a whole, and the U.S. consumer. By giving a comprehensive look at an industry that affects everyone, business leaders as well as individual consumers at the UURAF will be able to learn valuable information from my presentation that will impact their lives.

ROLES OF GRAPHICAL LITERACY IN STRUGGLING READERS' WRITING

Jessica Lang, Tracy Szutkowski

Mentor(s): Natalie Olinghouse (Teacher Education, Council, Educational Psychology and Special Ed)

Graphical literacy, the ability to learn information from additional book features such as graphs, maps, pictures, and captions, has only recently begun to be examined. Little is understood how students obtain information from these features. The purpose of this study was to analyze how much information from additional book features students retained from informational text and then used in their writing. This research is an extension of a larger study, Reading and Writing Connections in Struggling Readers, which analyzes how students transfer knowledge learned from informational text into their writing. Participants included 53 students, grades 2-5. Students received an intensive word reading and comprehension intervention while reading a text about pioneers. Before and after they read, each student wrote what they knew about pioneers. We explored how much of the information in their report came from the graphics, captions, and maps included in the pioneer text. Writing samples were scored based on a coding system that indicated the type of additional book feature (e.g., graphic, caption, map) and the link between additional book features and the traditional text. Through our scoring and analysis, we will describe whether students included information from these features in their writing, and what type of additional book features appeared most frequently in students' writing. This study will also compare how struggling readers use additional book features as compared to traditional text to inform their writing. Implications for classroom practice also will be discussed.

THE G8 PROTESTS: IDEOLOGY, TACTICS AND STRUCTURE IN ACTION

Stefan Lanweremeyer-Katharios

Mentor(s): Louise Jezierski (James Madison)

In June 2007, the Group of Eight Nations (G8), held its annual summit in Heiligendamm, Germany. Comprised of Germany, France, the United Kingdom, Italy, Japan, the United States, Canada and Russia, the G8 is an international forum that discuses major economic and political issues. However, the true story of the summit lay not within its convention's halls but through the chorus of protest beyond the G8's eight- mile "security fence". Involving upwards of eighty thousand people, the protests against the G8 were both massive and dynamic. Amongst protesters, ideological differences translated into competing views of activism, tactics and structure. Members of the 'traditional left' such as labor unions, church organizations, and NGOs, approached the G8 through a social democratic perspective. Advocating reform, the traditional left relied on symbolism and large demonstrations to influence the G8 and affect change on issues such as privatization and labor reform. In contrast, the radical left, influenced by anarchist, autonomist and communist ideology reflected their anti-capitalist revolutionary goals by calling for the disruption of the Summit and dissolution of the G8.The G8 protests illustrated the radical left's direct actionist and direct democracy paradigm in action. Deficient in any comparable infrastructure, the traditional left was largely unable to influence the direction and course of the demonstrations. While the G8 affirmed the radical left's tactical, and to a certain extent, ideological approach, it also forced the traditional left to take seriously the emancipatory demands expressed by their grass roots supporters and to reevaluate accepted notions of activism.

STUDENT GENERATED PROTECTIVE BEHAVIORS TO AVERT SEVERE HARMS CAUSED BY ALCOHOL CONSUMPTION

Carolyn LaPlante, Alex Mayer

Mentor(s): Sandi Smith (Communication)

It cannot be ignored that many college students participate in heavy alcohol consumption, which can often lead to negative consequences. A survey was distributed during the fall of 2006 to 891 Michigan State University students which asked them what they believed were the most severe harms associated with drinking and the behaviors they engaged in to protect themselves from those harms. The top five harms identified, in order, were: forced sex, legal trouble, physically injuring another person, unprotected sex, and damaging relationships. Across all of these categories, the number one strategy students used to protect themselves was personal responsibility, which was defined as knowing their own limit or when they have had enough to drink, as well as the ability to monitor their own behavior. This shows that the majority of students rely heavily on their own self-control to protect themselves, which may be a concern because intoxication can limit self-monitoring abilities. The top five behaviors used to avert each severe harm and the gender differences in perceptions of those harms were also analyzed. These findings are significant because they provide insight into the behaviors and beliefs of MSU students. This information can be used to craft social norms messages, which seek to encourage healthy behaviors by informing students that the majority of their peers are engaging in protective behaviors. These particular results can aid in tailoring those messages towards certain anticipated harms. Future research should continue to obtain information about students' protective behaviors, as they may change over time.

THE ROLE OF JUMONJIC DOMAIN CONTAINING PROTEINS IN TRANSCRIPTION AND CHROMATIN MODIFICATION

Jacqueline Lapp

Mentor(s): Steven vanNocker (Horticulture)

In eukaryotes, DNA is packaged into chromatin, composed mostly of histone proteins. Histones can be post-translationally modified at their N-terminal tail by methylation, acetylation, or phosphorylation of specific amino acid residues, and these modifications help to regulate the transcriptional activity of nearby genes. JumonjiC-domain containing proteins (Jumonji proteins), such as human UTX1 and JMJD3, have recently been found to enzymatically remove methyl marks from histones, and thus act as potentially important regulators of transcription. However, higher eukaryotes contain numerous additional Jumonji proteins, and the activity and biological function of most of these remain unknown.

To further investigate the role of Jumonji proteins in growth, development, and chromatin modification, we used artificial microRNA (amiRNA) technology to disrupt each of the 21 Jumonji genes in transgenic Arabidopsis. We are analyzing the resulting transgenic lines for defects in histone methylation patterns and development.

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)

Rein tension in horseback riding exhibits two spikes during each trot stride that occur in association with the diagonal stance phases. This pattern is seen despite the fact that the rider reports sensing a constant tension in the rein, raising the question of what causes these peaks. It is hypothesized in this study that the peaks can be attributed to the natural oscillations of the horse’s head and neck during motion. Kinematic analysis is performed with a motion analysis system which tracks the motion of reflective markers placed on bony anatomical landmarks. Rein tension is measured with strain gages using either elastic or inelastic reins attached to a surcingle. The timing of the vertical displacement of the head and neck is currently being analyzed in relation to the spikes in rein tension, and these findings are compared between different horses. This research has applications in riding and training techniques, equipment design, equine performance, and lameness evaluation.

PERSONALITY AND DECISION MAKING (SENIOR HONORS THESIS)

Nicole Lawless

Mentor(s): Richard Lucas (Psychology)

The current research is aimed at testing how competing models of mood regulation explain people’s decisions to learn about their strengths versus weaknesses. Good moods lead people to think critically and about the future—as opposed to immediate—consequences of their actions. One form of mood regulation requires that the person think in this way, while another necessitates that the person simply try to maintain their good mood. Because this is the case, it is hypothesized that

these regulation strategies will arise only when the person is in a good mood. Furthermore, when the situation is self-relevant—when personal gains may be foreseen—-the choice between these two strategies will be dictated by individual differences. Specifically, those who have more emotional resources (for example people with high self-esteem) should rely upon the model that allows them to focus on some future reward, even if this means experiencing a temporary bad mood. Conversely, those with fewer resources (e.g., people with low self-esteem) should remain focused upon maintaining a potentially transient positive mood. The possible 'resources' chosen for analysis are Big Five personality traits, trait affect and trait self-esteem.

GOVERNMENT RECEPTIVENESS TO DEMANDS FOR SANITATION IN RURAL BANGLADESH

Debrah Lee

Mentor(s): Grant Littke (Director of Field Experience and Student Affairs)

The BRAC Water, Sanitation, and Hygiene (WASH) program developed resulting from national demands and needs as well as an international demand as designated through the Millennium Development Goals. BRAC is the world's largest national non-governmental organization and is centrally located in Bangladesh. In accordance with BRAC's underlying philosophy and practice, the WASH program similarly focuses on responding to the needs of the poorest members of society. A component of the WASH program is to provide water, sanitation, and hygiene education in order to create demand for sanitary and hygienic materials among the rural population. The government, through separate water and sanitation initiatives and programs, offers a designated number of sanitary latrines to the rural population. This study seeks to determine the success of the WASH program in its creation of effective demand and the subsequent allocation of material to the rural poor. Accordingly, the study seeks to measure the capacity of the WASH program to increase the government's responsiveness in material allocation through the development of a medium within which the needs of the poor are expressed and effectively taken into consideration.

REGULATION OF 4403 PROMOTER IN MYXOCOCCUS XANTHS

Jun-seok Lee

Mentor(s): Lee Kroos (Biochemistry)

Myxococcus xanthus is a gram-negative δ-proteobacterium that is commonly found in topsoil. In the absence of nutrients, these microorganisms aggregate and form multicellular structures called fruiting bodies. Each fruiting body contains approximately 105 starving cells. This multi-cellular development process is regulated by cell-cell signaling. C-signaling is one of the chemical signals required for formation of fruiting bodies and gene expression leading to sporulation. The Kroos group has performed extensive mutational analysis to identify cis-acting elements of five C-signal-dependent transcription units (dev, 4400, 4499, 4403, and 4406). Two common cis-acting sequences named, the 5-bp element (GAACA) and the C box (CAYYCCY) have been formed to be important for promoter activities. My project is to identify transcription factors for 4403 expression and to determine why 4403 expression depends strongly on C-signaling. FruA is a protein that regulates gene expression in response to C-signaling. Previous work in the lab has found that the FruA DNA-binding domain binds to the 4403 promoter region. Gel-shift assays performed recently with partially-purified protein prepared from 12h developing cells, showed three shifted complexes with -97 to -17 region of the 4403 promoter (this region contains a 5-bp element and C-box). A similar pattern of binding was produced with purified His10-Mrpc2 (essential transcription factor for fruA expression, shown to bind at 5-bp element and C-box by another study in the lab) expressed in *E.coli*. Current experiments are mapping the position of binding by performing gel shift assays with short DNA segments spanning the 4403 promoter region (-97 to -17).

THE RACIALIZATION OF HAWAII NATIVE SENATOR BARACK OBAMA IN STATE AND NATIONAL MEDIA: A CROSS MEDIA ANALYSIS

Kristen Lee

Mentor(s): Geri Alumit Zeldes (Journalism)

In a society founded on socially-constructed principles like using race to justify slavery, identities and beliefs, ultimately lives have been altered. The late Edward Said, critic of the socially-constructed ideology, "Orientalism" believes the mainstream media continues to evoke this Orientalist stereotype when portraying people of the "East." Said describes Orientalism "as a Western style for dominating, restructuring, and having authority over the Orient" (Said 3). The Western media uses cultural

imperialism to restructure the identity of people from the "East," which is the basis of my research. The purpose of my research is to follow the racialization (defining one by race) of one public figure's identity in its most influential form through the media. I will study how Democratic Presidential hopeful Senator Barack Obama's multicultural identity is ignored, over-simplified and racialized. My method consists of a quantitative and qualitative media content analysis, studying Hawai'ian, Michigan and Illinois radio transcripts and newspaper articles that I will collect for three months starting in January of 2008. I will compare the state coverage to the national coverage of Obama. The analysis will involve how each network frames Obama's racial and cultural background, how Obama reacts to the racialized questions, the language used to portray Obama and whether the race of the journalist will affect the coverage of Obama's identity. I expect media coverage will continue racializing Obama's identity and perpetuate the Asian invisibility, stereotype, which is an Orientalist theme, by ignoring Obama's Hawai'ian/Indonesian cultural upbringing.

GENOTYPING ANALYSIS OF TPH2 AND DDC SNPS IN DOG BREEDS EXHIBITING A VARIETY OF BEHAVIORS

Lawrence Lee

Mentor(s): Donna Housley (Microbiology & Molecular Genetics)

Dogs have been increasingly popular as a model organism among scientists studying the genetics of behavior because of the enormous amount of behavioral diversity found between different dog breeds. Strong selection for certain favorable genetic traits has resulted in purebred strains of dogs that exhibit specific behaviors. This study focuses on two genes involved in different aspects of neurotransmission, tryptophan hydroxylase 2 (TPH2) and dopamine decarboxylase (DDC). TPH2, is a rate limiting enzyme that synthesizes serotonin. DDC is responsible for the synthesis of dopamine and serotonin. Previous research identified a nonsynonymous polymorphism (SNP) in each gene. The main objective of this study was to expand upon a preliminary genotyping analysis of these SNPs in dog breeds exhibiting a variety of behaviors. PCR amplification followed by restriction enzyme fragment length differences were used to determine genotypes for each SNP from 164 dogs representing 16 different breeds. These data were combined with previously generated genotypes from 10 breeds. Allele frequencies within each breed were calculated. Although the numbers of each breed are small, we are looking for trends in shared allele frequencies between different breeds that share common behaviors, such as reactivity, inattention, or hyperactivity. If either allele of TPH2 or DDC is overrepresentated in different breeds that exhibit similar behaviors, it would suggest that these polymorphisms could be functional differences that influence behavioral phenotypes. We are currently analyzing the relative frequencies of the alleles to determine if there is any correlation between the two SNPs and breed specific behaviors.

POSSIBLE INVOLVEMENT OF SERUM AMYLOID A IN BREAST CANCER

Karren Lewis

Mentor(s): Richard Miksicek (Physiology)

Serum amyloid A proteins are a part of the acute inflammatory phase response and levels can be increased up to a 1000-fold in response to biological assault. Four genes exist SAA1 and SAA2, which are most commonly produced by the liver during the acute phase response, SAA3 is seen in extrahepatic processes, and SAA4 which is a component of normal HDL. Expression of the serum amyloid A genes has been connected to NFkB, an important mediator of many immune responses. Expression of SAA has been seen in many epithelial tissues including breast tissue. Serum amyloid was shown to increase 20-fold in mammary tissue treated with R5020 progesterone. Thus the connection to increased SAA expression is being examined in this study. Promoter regions for SAA genes1 through 4 were subcloned and will be combined with a luciferase gene and placed in the pUC19 plasmid. A cDNA for firefly luciferase has already been inserted into this plasmid and confirmed by DNA sequencing. Once these serum amyloid A reporter constructs have been completed, steroid treatments with R0520 will be conducted to better understand how SAA expression is regulated in representative breast tumor cell lines. These results may have implications in the detection of breast cancer and understanding the etiology of this disease.

COMPLEMENTATION OF CJ1419C IN CAMPYLOBACTER JEJUNI NCTC 11168

Lauren Liddell

Mentor(s): John Linz (Food Science & Human Nutrition)

Campylobacter jejuni is the most frequently diagnosed bacterial cause of human gastroenteritis in the United States, producing approximately 2.4 million cases of campylobacteriosis in the U.S. yearly. Dr. John Linz and his research faculty believe that genetic variation in C. jejuni, through natural transformation, intragenomic recombination, and contingency gene mutation,

enables the organism to infect humans at high frequency. In order to test this hypothesis, a transposon library was produced using Tn5, known to contain a chloramphenicol marker. Cells with incorporated transposon DNA were then selected for on media containing chloramphenicol and functionality assays for natural transformation were performed using kanamycin marked foreign DNA. Colonies suspect of containing non-functional, "knock-out" competence genes, interrupted with transposon DNA were then selected for by their presence on chloramphenicol plates, and absence on chloramphenicol + kanamycin plates. Among the competence genes identified from the screening of the C. jejuni transposon library, includes cj1419c, a putative methylase thought to convey some importance to the success of C. jejuni in acquiring foreign DNA. My research project focuses on the creation and introduction of a suicide vector including a non-functional copy of the gene of interest, cj1419c , into the chromosomal DNA of C. jejuni NCTC 11168, as well as the creation of a complementation vector to reintroduce a functional copy of the gene.

EFFECT OF SOIL TYPE ON ROOT DEVELOPMENT OF PINUS PONDEROSA VAR SCOPULORUM UNDER DROUGHT CONDITIONS

Alexander Lindsey

Mentor(s): Jason Kilgore (Plant Biology)

Plant roots grow to develop an underground absorption system to take up water and nutrients, as well as to anchor the plant in the soil. I tested the hypothesis that drought may stimulate root growth because roots would have to travel farther to gain better access to soil water. Conversely, root systems of drought stressed plants could experience reduced growth. I designed and built minirhizotrons to observe effects of drought on root growth. In the pilot experiment, I imposed nine days of drought stress on seven-day-old mung bean (Vigna radiata) seedlings. I observed no effect of this drought treatment on root development; processed root images extended beyond the calibration curve. I found no significant ($\alpha < 0.05$) difference between the drought and control plants in hypocotyl and epicotyl height. However, drought stressed plants had significantly lower leaf transpiration (t-test, n=8, p=0.002) and lower stem xylem pressure potential (t-test, n=4, NS), indicating there was an observable difference in ecophysiology despite no observable difference in growth. In the final experiment, I investigated the interaction of soil type and drought stress on root growth of Ponderosa pine (Pinus ponderosa) germinants. Ponderosa pine is moderately tolerant of drought stress, suggesting that water stress and soil type may interact to influence root growth. I compared soil physical properties and ecophysiologic responses by pine germinants under drought to two different native soil types (limestone and granite), an industry standard conifer media, and a custom conifer mix.

UNDERSTANDING THE LINK BETWEEN CELL DEATH AND DIABETIC BONE LOSS

Dennean Lippner

Mentor(s): Laura McCabe (Physiology)

Type I diabetes is characterized by a lack of beta cells that produce insulin in the pancreas, which leads to a deficiency of insulin and high blood glucose levels. It is also associated with bone loss and decreased bone formation. Bone phenotype changes occur within 5 days after induction of diabetes by a pharmacologic method, streptozotocin injection. We hypothesize that bone death occurs during this early period and contributes to diabetic bone loss. To examine the correlation between diabetes and bone cell death, c-fos protein levels, which increase during cell death, were analyzed in diabetic and control mice. In diabetic mouse tibias, there was significantly more c-fos positive bone-lining cells compared to control bones. Differences were even greater after longer time points (7 and 11 days after injection). These results suggest that diabetes induces apoptosis in bone cells. To provide direct evidence that cell death is increased in diabetic mouse bones, TUNEL (terminal deoxynucleotidyl transferase-mediated dUTP nick-end-labeling) assays are being performed. This assay labels DNA end fragments, which are increased in number when cells are in late stages of apoptosis. I will compare the number of TUNEL positive cells seen in diabetic and control mouse tibias. From these results, I will determine if cell death is indeed occurring at a greater level in diabetic bone.

INTERACTIONS OCCUR BETWEEN AUTOCHTHONOUS AND ALLOCHTHONOUS PROCESSES IN A HEADWATER STREAM

Amanda Lorenz

Mentor(s): R. Jan Stevenson (Zoology)

Both benthic algae and allochthonous organic matter are dominant energy sources in headwater streams, but little is known about interactions between these sources. We hypothesized that algae could either decrease leaf decomposition by competition with microbes or increase leaf decomposition by increasing invertebrate shredding activity. To test these

hypotheses, we placed leaf packs in a headwater stream and manipulated light, macroinvertebrate access, and nutrient addition (N+P) in a 2x3 factorial experiment. The light reduction treatment significantly reduced algal biomass within leaf packs ($p<0.001$). We observed a significant interaction effect on leaf decomposition between light and macroinvertebrate access to leaf packs ($p=0.01$). Decomposition was faster in light compared to dark treatments in the presence of macroinvertebrates and slower in light compared to dark treatments in the absence of macroinvertebrates. Additionally, macroinvertebrate community composition on leaf packs was affected by both nutrient addition and light, although we did not observe a nutrient effect on decomposition rates, suggesting microbes did not compete with algae for N/P. These results support our hypothesis that algae may have complex effects on leaf decomposition and suggest that interactions between energy sources may have significant effects on headwater stream function.

MICHIGAN WASTE MANAGEMENT

Roger Ludy

Mentor(s): Carol Prahinski (MArketing and Supply Chain Management)

The goal of this research is to analyze data related to Michigan's Waste Management practices and note opportunities for business development.

ENGINEERING A CYSTEINE-LESS SPOIVFB

Paul Luethy

Mentor(s): Lee Kroos (Biochemistry)

SpoIVFB mediates regulated intramembrane proteolysis in the soil bacterium Bacillus subtilis. When starved, this bacterium undergoes spore development directed by several transcription factors. Pro-σk is one of these factors, and requires that SpoIVFB process it to σk before gene expression can begin. To determine accessibility of SpoIVFB to cysteine-modifying reagents, we are trying to construct an active, cysteine-less version of the protein. Previous work showed that of SpoIVFB's 5 cysteine residues, two could be changed to serine without loss of activity, but the other three residues, when changed to serine, inactivated the enzyme. If these three residues were instead mutated to alanine, could a functional cysteine-less SpoIVFB be created?

HOW THE HUMAN EYE PROTEINS PHYSIOLOGICALY DIFFERENTIATE DIFFERENT WAVELENGTHS OF LIGHT

Michael Lundin, Alex Grushky

Mentor(s): Xiaofei Jia (Chemistry)

The mamalian eye senses the different wavelengths of visible light through rod and cone cells found in the retina. The proteins that sense the light, rhodopsin, and the three different opsins, are integral membrane proteins in small membraneous pouches in the rod and cone cells. The confounding factor is that the same ligand is reacted on by rhodopsin and different opsins to see different wavelengths of light. Here, we attempt to explain this phenomenon by through several protein mechanisms, including affecting the conjugation of the ligand, 11-cis retinal with lysine and glutamate residues.

ANALYZING THE EVOLUTIONARY RATES OF INTRACELLULAR AND EXTRACELLULAR PROTEINS

Joshua Mackaluso

Mentor(s): Maria Zavodszky (Biochemistry)

Comparing the evolutionary rates of intracellular and extracellular proteins of various species is a useful approach to understanding the effects of mutations at the molecular level. While many mutations result in no significant observable changes, some mutations can lead to the development of drug resistance in bacteria or the development of harmful diseases in humans. The accumulation of mutations can result in proteins that have entirely new functions. In order to better understand how species evolve, more knowledge regarding the evolution of proteins is necessary. Not all proteins evolve at the same rate. Proteins with many interacting partners or those that have critical functions for life have been shown to be more conserved than others. It is believed that the cellular location of a protein affects its evolution, with proteins residing in the extracellular space showing higher rates of evolution than intracellular proteins due to higher exposure to environmental stress. In order to test this hypothesis, a dataset has been constructed of human protein structures with known cellular location. Each protein within the set has been paired to its orthologous mouse protein. As a first approximation, the rate of evolution is calculated as

the percent of amino acids that differ between the human and mouse proteins. Further analysis is expected to reveal whether surface residue mutations contribute differently to the rate of evolution than the mutations of buried ones.

ELECTRIC PROPERTIES OF GRAPHENE

William Martinez

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

Graphene, or a single layer of graphite, is effectively a two-dimensional form of graphite. Recently, it has become of great focus in the condensed matter physics community; since the first paper on the subject was published in 2004, it has already been cited over 400 times. Once not believed to exist naturally in a free state, graphene has been found to demonstrate remarkable properties. Some interesting phenomena include the lack of band gaps, it's suppression of localization, the unique quantum Hall effect that survives up to room temperature, and it's high mobility. It took years for the first group to isolate few-layer graphene (FLG) and single-layer graphene (SLG) on a substrate, one of the most challenging parts of graphene experimentation. Our lab has since optimized a fabrication technique to easily create and locate FLG and SLG. Because we have optimized the preparation of graphene on Silicon Dioxide substrates, which has been our main focus until recently, we are now ready to continue on to test certain electrical properties of a graphene sample. In the coming months we hope to be able to test some of the above phenomena as well as run some experiments that have yet to be attempted by other groups around the world.

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

Ryan Mayle

Mentor(s): Barbara Sears (Plant Biology)

Although photosynthesis is essential for harvesting the sun's energy, the process generates oxygen radicals at three different sites in the chloroplast thylakoid membrane: photosystem I and II, as well as the light harvesting complex of PSII. These oxygen radicals can cause mutations if they reach the DNA. Plants possess pathways to detoxify reactive oxygen species to protect their photosynthetic apparatus, but it is unknown if the same pathways protect their chloroplast DNA. My research project assesses reactive oxygen damage genetically, by comparing mutation rates between two cell lines of the green alga Chlamydomonas under various light conditions. One cell line is light sensitive, due to mutations in the npq1 and lor1 genes, which cause a non-photochemical quenching deficiency. It is expected that this line will accumulate more chloroplast mutations than do wild type cells. In the other cell line, transgene expression results in high levels of the antioxidant tocopherol within the chloroplast. If oxygen radicals from PSII are the primary source of mutations in the light sensitive cells, tocopherol should act to reduce the mutation rate by quenching some of the radicals that attempt to cross the thylakoid membrane. Chloroplast DNA mutation rates are being assessed by isolating DNA from spectinomycin resistant mutants and characterizing changes in the sequence of the 16s rRNA gene. Initial results suggest that the light sensitive line has a significantly higher mutation rate than wild type cells, and that higher tocopherol levels lower the mutation rate only slightly.

THE BLACK MIDDLE CLASS: A REINFORCEMENT OF WHITE VALUES, WHITE RACISM, AND WHITE CULTURE

Kyle Mays

Mentor(s): Louise Jezierski (Social Relations)

This research looks at the black middle class and seeks to understand the identity of the black middle class as well. While the black middle class is fragmented, it supports white values, white culture, and white racism because it eschews the black poor and outsiders in general. The methodology used for this paper consisted of an open-ended twenty-two question questionnaire and nine respondents were a part of the convenience sampling. The data concluded that the black middle class has lost touch with lower class blacks and while believing that they have a "stake" in society, they do not realize that their status as a black middle class member is different from the white middle class. The only way to create solidarity among black people is through Black Nationalism. Self-empowerment and community control as well as mixed income neighborhoods can change the inequality in values between the black middle class and lower class blacks. Once the black middle class returns to their inherent role of black social responsibility, their values will merge and influence those of the black lower class.

DETERMINING THE AMMONIA EMISSION RATE OF EQUIDS DUE TO FEED PROTEIN CONTENT

Kevin Mazor, Christine Kostesich, Kristin Merony
Mentor(s): Nathalie Trottier (Animal Science)

Ammonia is an organic molecule which, in high atmospheric concentrations, results in acidification and eutrophication of the environment. The former leads to acid rain and a decrease in soil pH, while the latter causes algae blooms, resulting in a decrease in the oxygen content of bodies of water. A major contributor of nitrogen emission in the atmosphere emanates from the biological breakdown of urea, uric acid, and undigested proteins found in the excrement of livestock. The purpose of this study was to monitor nitrogen utilization and ammonia excretion of equids in relation to the dry weight protein content of the feed given. Six horses were fed six diets of different protein contents. A 6 x 6 Latin square was used to assign the diets to the horses over the six-week data collection period. The ammonia emission was determined through the use of eight-hour diffusion tubes that measure the emission rate of ammonia through the reaction of gaseous ammonia and sulfuric acid to discolor the indicator band. The tubes were placed at constant distances from the ground on each stall wall in order to give an average of the overall ammonia emission in the stall. Temperature and humidity were also taken into account to determine overall trends due to these conditions. Emission data is currently being collected for the final feeding period.

CHARACTERIZATION OF THE TELOMERE PROTEIN POT1B IN TETRAHYMENA

Serina Mazzoni
Mentor(s): Carolyn Price (University of Cincinnati Molecular Genetics)

Telomeres are regions of repetitive DNA that serve to protect the ends of linear chromosomes from degradation. Associated with a telomere are many proteins. One of these proteins, POT1, binds to the 3' overhang and was originally thought to have a role in the protection of telomeres. We use the ciliate, Tetrahymena thermophila, to study telomeres because it is easy to grow and genetically manipulate, its genome has been sequenced, and it has about 40,000 telomeres per cell (compare 92 per cell in humans). Tetrahymena thermophila has two POT1 proteins; POT1a and POT1b. POT1a binds to and protects telomeres. Without it, cells undergo a cell cycle arrest. The function of POT1b is unknown. Other lab members have previously shown that POT1b does not directly bind telomeres and is not essential in vegetative cells. However, it was seen that POT1b is expressed in mated cells just prior to new telomere synthesis. To further explore the role of POT1b in new telomere synthesis and mating, I am creating POT1b knockouts in two Tetrahymena strains of opposite mating types. These strains can then be mated to see how POT1b KO's differ from wild type Tetrahymena. I am also exploring how POT1b interacts with telomeres. It is thought that because it does not directly bind telomeres, POT1b may have binding partners. I am creating a His-TAP tagged version of POT1b that will be used to look for such binding partners.

PATTERN RECOGNITION AND DISCRIMINATION IN HORSES

Ashley McCarthy
Mentor(s): Janice Siegford (Animal Science)

In order to enhance the learning environments and improve training methods used with horses, it is important to understand what horses can see, learn and remember. Horses can distinguish between single, black and white shapes; however no studies have been published determining whether horses can distinguish between complex black and white patterns. Horses primarily have monocular vision and are thought to have limited visual acuity; however, many features of their domestic environment may require focusing on items at close range. Determining if horses can distinguish one complex black and white pattern from another will help describe the limits of horse visual acuity. Seven Arabian horses will be tested at the MSU Horse Farm. Horses will discriminate between two buckets with black and white patterns (vertical stripes or checkers) for a food reward. Buckets will be placed on the ground (10' apart) at the perimeter of a 30' round-pen with a solid partition separating them. Only one bucket will contain the reward. Horses will be released into the pen and allowed to choose a bucket. The partition limits the horse to selecting a single bucket during each trial/test. Each horse will have four training and four testing trials. One horse will be tested 24hr later to assess long-term memory. Horses will be evaluated on number of correct choices and time for each choice. We hypothesize that horses are capable of learning to distinguish one complex pattern from another to receive a food reward.

A NEW ICHNOSPECIES OF ARTHROPHYCUS FROM THE LATE CARBONIFEROUS (PENNSYLVANIAN) OF MICHIGAN, USA

Victoria McCoy

Mentor(s): Danita Brandt (Geological Sciences)

A unique ichnofossil assemblage from Pennsylvanian-age sandstones near Eaton Rapids, Michigan, USA, comprises sinuous traces preserved in convex hyporelief, showing the transverse ridges and median grove typical of the ichnogenus Arthrophycus. The Eaton Rapids traces do not branch, but they do show pseudo-branching (known from other Arthrophycus specimens) and are among the smallest structures (millimeters in diameter) attributed to this ichnogenus. The Michigan traces are distinct from other ichnospecies of this taxon in showing a pronounced alignment of the burrows, as opposed to the more common multi-planar, interweaving, "bundled" nature typical of the ichnogenus, and we assign the Michigan specimens to a new ichnospecies of Arthrophycus. The "paralleling behavior" of the new specimens may reflect a strategy of the trace-maker to avoid previous burrows and reflect differences in resource availability or current energy. The new specimens extend the geographic range of Arthrophycus into Michigan and confirm the occurrence of this ichnogenus in Upper Carboniferous strata.

LEAD SARCOPHAGUS

Erin McCue

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

I am using the lead sarcophagus panel on view at the Kresge Art Museum to launch my research on lead sarcophagi. I am researching the techniques of how these various sarcophagi were made (mainly sand casting), what they are decorated with (dolphins, grapes, leaves, and Medusa heads), and what those decorations represent and how they differ. I also will have drafted up an illustration of the sarcophagus panel in the Kresge Art Museum to have on display on the poster.

HISTORIC INTERIORS OF MICHIGAN STATE UNIVERSITY BUILDINGS

Megan McNally

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

There is a lack of documentation of historic interiors on Michigan State University's campus. Photo documentation and building plans provide a historical record of how the interiors have changed over time. Many of the changes of campus interiors are due to technological advances, new uses for space, larger student bodies, and damage due to disrepair and fire. For this project, related to my research assistance for Dr. April Allen in her study of historic preservation and adaptive reuse, I have utilized the Michigan State Archival Library for images, personal accounts, building plans, and other documents relating to interiors on campus. Selected buildings were then compared to current photographic images to evaluate whether the modifications of the current state and conditions were appropriate to the historic integrity of the structures. These past and current records provide evidence of the original historic structures, and how they may be restored according to the Secretary of the Interior's Standards for Rehabilitation as we try to preserve and adapt our University for growth and change.

ALTERNATIVE MEDICINE AND AMERICAN DOCTORS

Krish Mehta

Mentor(s): Elizabeth Spence (Writing, Rhetoric & American Culture)

The major differences between Eastern and Western approaches to medicine involve traditional versus scientific methods, spiritual versus practical solutions, purifying versus fighting techniques, and natural versus synthetic cures. My study will provide background on the traditional and modern practices of yoga, Ayurveda, Shintoism, and Acupuncture. It will include original research based on surveys of MSU's medical students. My hypothesis is that Asian Americans will be less enthusiastic about their traditional ethnic medicines than their non-Asian counterparts will be. I theorize that students of Asian descent will regard Eastern medicines from a historic perspective, and recognize a direct correlation between extended life expectancy and the introduction of Western medical practices in their ancestral lands. On the other hand, non-Asian medical students may take a more open-minded approach. They may view the continuation of ancient practices as some indication of validity in itself. They may also be attracted to Eastern approaches in contrast to the empirical practices of the West.

DISTRIBUTION OF RUST IN CARBONACEOUS CHONDRITE, AND IMPLICATIONS FOR DIFFERENTIAL PERMEABILITY OF MATRIX, RIM AND CLAST MATERIALS ON THE CM CHONDRITE PARENT BODY

Michael Mendoza, Katie Beiser

Mentor(s): Michael Velbel (Geological Sciences)

Primitive meteorites (chondrites) preserve evidence of conditions in the early solar system, predating most of Earth's heavily modified early geologic record. Some members of one meteorite group (carbonaceous chondrites) preserve evidence of interactions of water with minerals on the ancestral parent bodies. This study compares a fresh fall CM2 chondrite (Murray) with EET92005, discovered in Antarctica. Differences in elemental associations in otherwise similar textural constituents result from terrestrial weathering (mainly the oxidation of iron) of the Antarctic chondrite. This study uses weathering effects as a tracer of how water and solutes move through the matrix, rim, and chondrule/clast constituents of carbonaceous chondrites. Elemental compositions of both meteorites are compared by using scanning electron microscopy with energy-dispersive X-ray mapping. Olivine (a silicate of magnesium, iron and silicon) occurs in both meteorites. Rust consisting mainly of iron with some chromium occurs in a large chondrule in the weathered chondrite, evidence of water alteration of meteorite EET92005 resulting from several million years exposure to terrestrial aqueous solutions. Calcium and sulfur are associated in part of the large chondrule of the weathered chondrite, suggesting formation of gypsum during terrestrial weathering. By examining the different textural constituents (chondrules, isolated mineral grains, fine-grained rims, and (fine-grained) matrix), the effects of terrestrial aqueous alterations can give insight into how water moves through and reacts with each constituents.

ENTREPRENEURS AND THE INSIGHTS THEY PROVIDE

Jared Merlo

Mentor(s): Ross Emmett (James Madison)

A formidable manner to understand entrepreneurship and the challenges faced by people starting ventures is through an understanding of theories of both the behavior of entrepreneurs and their larger role in an economy. This project seeks to combine economic and psychological based theories of entrepreneurship with empirical evidence of entrepreneurial behavior in order to better understand challenges faced by entrepreneurs and to help would-be entrepreneurs prepare for these challenges. In today's world there are certain "hot spots" for entrepreneurial activity. For example Silicon Valley or Cambridge Massachusettes might constitute one of these entrepreneurial epicenters. But the greatest growth from entrepreneurial activity is found in developing countries. One of these developing countries, that deserves the label of emerging market is India. The empirical evidence from this study was gathered by means of interview from a group of 7 entrepreneurs in India. The project seeks to combine their experience with classic theories in order to paint a picture of the entrepreneur as a character.

CIVIL SOCIETY ORGANIZATIONS IN MUSLIM MINORITY COMMUNITIES: A COMPARISON

Nicholas Micinski

Mentor(s): Michael Schechter (International Relations)

Much has been written on Muslim populations' place in the West, but the actual sites and organizations through which Muslims participate in non-Muslim societies have been largely ignored. Often times the actual ways Muslims interact with the majority culture are through civil society organizations where they gain economic and civic skills, such as language skills. My paper argues that Muslim civil society organizations play a unique and essential role in Muslim Diaspora and minority communities by teaching civic and economic skills but also by affirming and constructing cultural and religious identities within non-Muslim majorities. Based on interviews conducted in Brazil, France, Norway, Russia, India, Singapore, and the U.S., this paper shows for the first time the facilitating conditions under which Muslim civil society organizations teach civic and economic skills while affirming cultural and religious identities, more so than has been traditionally understood.

SYNTHESIS AND EVALUATION OF ELECTRICALLY ACTIVE MAGNETIC NANO AND MICRO PARTICLES FOR BIOSENSING OF BOVINE VIRAL DIARRHEA VIRUS

Hanna Miller

Mentor(s): Evangelyn Alocilja (Biosystems Engineering)

Electrically-active magnetic (EAM) nano and micro particles will be synthesized from aniline monomer using Fe_2O_3 nanoparticles as the template. The EAM nano and micro particles will be used in a biosensor for the detection of Bovine Viral Diarrhea Virus (BVDV). Three different EAM particle size ranges will be synthesized and tested in the BVDV biosensor; size

ranges will be: 80-800 nm, 800 nm-2.5 µm and greater than 2.5 µm .The magnetic and electrical properties of the EAM particles will be characterized using DC SQUID Magnetometer and Four Point Probe, respectively. The absorbance of the EAM particles will be observed using a UV-spectrophotometer. The synthesized EAM particles will be conjugated with BVDV monoclonal antibodies and used to capture the virus from virus suspensions. The EAM captured viruses will then be directly applied to the biosensor. The resistance signal on the biosensor will indicate the presence or absence of the virus.

THE STRUGGLE TO DEVELOP AND PRESERVE THE DUALITY OF STUDENT-ATHLETES

Stephanie Mills

Mentor(s): Paulette Stenzel (Finance)

My research began with an analysis of the role that the NCAA has played in the shift of the collegiate student-athlete's role. The NCAA adheres to a set of seven core values that maintain the zest of collegiate athletics, including a value that states that the NCAA "…shares a belief in and commitment to…the pursuit of excellence in both academics and athletics." However, recent actions by the NCAA illustrate that the association may not be operating in a manner that results in "excellence in both academics and athletics." The underlying problem of the NCAA is that the NCAA has no graduation requirement for student-athletes. As a result, athletics is put above academics and the struggle to develop the duality of the student-athlete begins. A related problem arises through the manner in which student-athletes are compensated for their athletic abilities, athletic scholarships. The majority of my research focused on the solutions to these two problems. It is hoped that a solution that is able to solve both of these problems will be able to preserve the duality of the role of student-athletes. The attempts by the NCAA to solve the problems are sending the right message, but have achieved little. Other popular solutions have major flaws. No one current solution will be able to combat both problems. As a result, I introduce my solution: the introduction of monthly laundry money and required graduation rates.

IMPACT OF HAY PROTEIN QUALITY ON NITROGEN EXCRETION RATES IN THE MATURE HORSE

Andreá Minella

Mentor(s): Nathalie Trottier (Animal Science)

The objective of this study was to compare nitrogen (N) excretion profile in horses fed high quality grass hay (HGH; control diet) to that of horses fed either alfalfa hay (AH) or lower quality grass hay (LGH). It was hypothesized that N utilization in horses fed HGH was lower than that of horses fed AH but higher than that of horses fed LGH. Six Arabian geldings were fed the HGH, AH and LGH which contained 16.4, 17.9, and 10.6% CP, respectively. Alll urine (Ur) and fecal (Fc) matter was collected. Compared to HGH (control): total N excretion did not differ for AH and was lower for LGH ($P < 0.001$); fecal N excretion was lower for both AH and LGH; Ur N excretion was higher for AH and lower for LGH ($P < 0.001$); N digestibility was higher for AH and not different for LGH; Ur N relative to N absorbed was similar for AH and higher for LGH. In conclusion, despite lower digestibility in HGH, N is utilized as efficiently as that of AH; on the other hand, while HGH and LGH have similar N digestibility, N of LGH is utilized less efficiently. Analysis of blood urea concentrations is in progress to determine whether or not urinary N excretion can be predicted from blood urea nitrogen concentration.

EMBODYING SOCIAL ADVOCACY

Samantha Mitchell, Megan Brumbill, Christine Mccullough, Mary McGorey, Janelle Orser

Mentor(s): Sherrie Barr (Theatre)

Whether on or offstage or in or out of the classroom, social advocacy is integral to dance. Choreographers often engage elements of social advocacy in order to empower dancers in their learning and understanding of dances. This notion is critical for students as their education enhances awareness of the art form. Such empowerment invites them to have ownership – in movement vocabulary and choreographic intent. Dancers' voices, visually and audibly, become active agents of the creative process. We are investigating ideas concerning humanity and humanitarians. A unique research model is evolving as we investigate, creatively and through scholarship on socio-political issues. An overarching question is how, if at all, do our attitudes reflect in our dancing? As we interface physical and cognitive research, we have the opportunity to arrive at new ways of embodied knowing.

DEPLETION OF SULFUR WITHIN STARDUST SAMPLES AND ITS IMPLICATIONS ON UNDERSTANDING EXTRATERRESTRIAL BODIES

Michael Moran

Mentor(s): Michael Velbel (Geological Sciences)

Within the samples returned from comet 81P/Wild 2 by the Stardust mission, differing amounts of Sulfur were found based on the track's depth in the aerogel and which sample the track was taken from (Flynn and others, 2006). The capture process caused a loss of sulfides due to its high reactivity, skewing the results for initial composition of the comet (Zolensky and others, 2006). This study examines the individual beads to determine the gradual loss of sulfides during the capture process and to fully identify the trend between different samples and the relation to the amount of both sulfur and nickel compounds.

PRODUCT TYPE AND ONLINE INITIAL TRUST ANTECEDENTS

Meredith Morgan

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

Developments in online commerce have brought e-shopper perceptions to the forefront of consumer research. A literature review shows that studies of online consumer trust, for example, have been prevalent in recent years. This research model details procedures for a specialized investigation of consumer trust. Within the model, four product types would be analyzed. The goal of proposed research is to identify trust antecedents specific to each product category. Chen and Barnes' 2007 study of online initial trust provides a framework for this model. To a large degree, this study would replicate Chen and Barnes' study, which employed a questionnaire to examine participant attitudes about trust in a simulated online shopping experience. The present study would apply the Chen and Barnes instrument to four separate simulated shopping scenarios. Each would focus on one of Vijayasarathy's (2002) product categories: low cost, tangible; low cost, intangible; high cost, tangible; and high cost, intangible. Chen and Barnes organized potential online initial trust antecedents into several categories, including perceived technology, perceived risks, company competency, and personal trust disposition. In that investigation, antecedents from each category were hypothesized to affect online trust. This study would pose Chen and Barnes' hypotheses in the context of shopping scenarios involving each of the four product types. This study aims to identify product-specific antecedents and propose guidelines for the design of online retail interfaces. Additionally, the findings will serve as a basis for further investigation of e-shopper preferences, particularly analysis of product-type impact on trust.

META-ANALYSIS OF HUMAN-COMPUTER INTERACTION RESEARCH

Meredith Morgan, Christine Honer

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

Advancements in the field of human-computer interaction correspond with the development of a rich body of associated research. The goal of the present investigation is a meta-analysis of prominent HCI research. The investigation will include citation evaluations of individuals, countries, and institutions. The study will incorporate data from three peer-reviewed, refereed publications: Behavior & Information Technology, International Journal of Human-Computer Studies, and International Journal of Human Computer Interaction. Research productivity is the focus of the study; the meta-review is intended to reveal leading scholars, host institutions, and seminal
publications.

THE EFFECTS OF CHITINASE AND CATHEPSON ON MEMBRANE PROTEIN PRODUCTION IN ACMNPV

Abbey Mullen

Mentor(s): Dr Suzanne Thiem (Virology)

The research presented will be utilized to examine the effect of chitinase and cathepsin on membrane protein production in the Autographa californica multiple nucleopolyhedrovirus (AcMNPV) baculovirus expression vector system (BEVS). For more than twenty years AcMNPV has been used to produce membrane proteins through the use of BEVS. However, the production of membrane proteins using this system is extremely inefficient. By deleting non-essential genes such as chitinase and cathepson from the AcMNPV DNA the BEVS should more efficiently be able to produce membrane proteins due to less interfering genes in the production cycle. Through a more efficient membrane protein production system the structure and function of several membrane proteins can be determined. By determining the structure and function of membrane proteins, the causes of multiple mutations and disease in the cell can be understood and future pharmaceuticals can be produced accordingly.

THE EFFECTS OF HYPOCRISY ON THE THREAT OF EXCLUSION IN SOCIAL DILEMMAS

Brian Mund

Mentor(s): Norb Kerr (Psychology)

This study looks at the effects of hypocrisy in social dilemmas on perceptions of trust and other traits; and subsequently these perceptions effects on reciprocity.

THE BARBARY WAR: PERCEPTIONS OF MUSLIMS AND THE INTERNATIONAL SYSTEM

Matthew Murray

Mentor(s): Sayuri Shimizu (History)

From the 15th until the mid 19th centuries, Muslim countries in North Africa (and Christian countries in Italy and Malta) supported corsairs that attacked merchant ships in the Mediterranean and Atlantic, enslaving the sailors and taking the ships' goods. These countries were collectively known as the Barbary States. In 1801, seizures of American ships and sailors led the United States to wage a four-year war against one of these countries, Tripoli. Prior to and during the course of the Barbary War, Americans constructed an image of Barbary (the very name implies barbarity) that represented lawlessness, chaos, and tyranny. They compared Muslims to animals, barbarians, and savages in diplomatic reports, military correspondence, and captivity narratives. By portraying Muslims as uncivilized and undisciplined, Americans defined themselves in opposition to this "Other." Americans constructed an image of North Africans, and contrasted themselves with this construction in order to form a solid American identity. By drawing on American primary evidence, including newspapers and political, diplomatic, and military records, this paper both demonstrates the language used to alienate Muslims and argues that this language was used to form the America's identity as the opposite of the alien, "Other," Tripoli.

LAKE MODELING FOR CONSERVATION IN THE PERUVIAN AMAZON

Daniel Myers

Mentor(s): Kelly Millenbah (Fisheries and Wildlife)

Using data taken by Columbia University graduate student Nancy Dammann in 2005, I am creating a 3-dimensional, interactive map of two lakes in the Peruvian Amazon which are important in the understanding of sound conservation and management practices in the area. This map includes features such as vegetation types, flood occurances, and lake bottom features, and was built using ArcGIS software.

ENHANCE SHOPPING EXPERIENCE WITH PERSONALIZED GUIDED TOURS

Khalil Nasser

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

Shopping at malls may be a thing of the past as online shopping is becoming more popular everyday. One of the main concerns regarding online shopping is to ensure that the customer has a positive shopping experience. This research proposes that a navigation oriented interactive environment with a personalized guided tour through a three-dimensional mall may enhance a customers shopping experience. The purpose of this research proposal is to suggest a method to test how a navigation oriented environment and a personalized guided tour effect a customers shopping experience. Hopefully the data which comes from this method would prove that these two factors are positively correlated to an increase in intention to purchase.

COMMUNICATION IN THE APPAREL AND TEXTILE INDUSTRY

Michaelene Novak

Mentor(s): Carol Beard (Apparel and Textile Design)

I will be presenting information related to the specific forms of communication commonly utilized in the apparel and textile industry. This information will serve the College of Arts and Letters in adjusting the writing requirements for Apparel and Textile Design majors.

ENERGY CONSUMPTION IN RESIDENCE HALLS

Martha Nowicki, Dana Benson, Laura Canever, Becca Jaskot

Mentor(s): Terry Link (Office of Campus Sustainability), Steven Safferman (Biosystems Engineering)

The objective of this study is to encourage lifelong habits of energy conservation. The purpose of this research is to evaluate the effects of an advertising campaign on student's energy consumption in residence halls. A control and experimental group design will be used, where both groups will be surveyed on their energy usage habits and behaviors. The experimental group will receive information through an in room kilowatt demonstration and a hallway energy campaign. This campaign will consist of bulletin boards made up of general facts about energy consumption, encouragement by authority figures such as resident mentors and housing directors, flyers which will be placed around the residence hall and stickers which will be placed on light switches. The two groups will then be surveyed again to compare their energy consumption. The goal of this research is to implement a campus wide advertising campaign which will deal with energy consumption in residence halls.

RESEARCH ASSISTANT AND COORDINATOR FOR ARTS MARATHON WEEKEND

Diana Obradovich

Mentor(s): Rob Roznowski (Theatre)

As of now, there is no programs at Michigan State University that explore the possible careers that relate to both Business and Theatre. I will be graduating with a degree in each field and have been given the opportunity to practically apply them in a hands-on way working on "Arts Marathon Weekend" at Michigan State University. With no previous knowledge of this type of work, I have been researching other art events similar in nature and options for events that could be held during the Marathon. I have been collaborating with other departments, including the Department of Theatre, and other community members to help create this unique event for the "Year of Arts and Culture." I have analyzed patron and department data related to the event for future arts programming. The hope is that an event such as this can continue to be done in the future and not just this one time for the "Year of Arts and Culture" at MSU. Arts are an important factor in life and everyone should learn how broadly defined the arts can be and how it is present in more ways than is traditionally thought.

METAPHORS IN CREATIVITY

Derek O'Leary

Mentor(s): Bruce Vanden Bergh (Advertising)

Dive into the research study that had students define what creativity is. Many people can say they can describe what creativity; but in most case, especially visual, people use metaphors. Without prompting from us, a class of students answered what creativity is in metaphors. We dove deeper into their answer by studying their projects and interviewing them about the project; what's in it and what isn't. The answers and presentation may surprise more than a ghost coming out of your dryer.

SOPHOMORE BRASS QUINTET

Nora Olson

Mentor(s): Curtis Olson (Music)

We are the Sophomore Brass Quintet in the College of Music

LOOKING ON THE BRIGHT SIDE: WHERE IN METROPOLITAN DETROIT HAS A MINORITY GROUP REACHED GEOGRAPHIC RACIAL EQUALITY

Mark O'Neall

Mentor(s): Joe Darden (Geography)

This study differs from other studies on racial equality. Using 2000 U.S. Census Data, this paper tests the hypothesis that there are minority groups in metro Detroit that have reached geographic racial equality. That is, they have matched or surpassed whites in median household income, educational attainment, and job status. Additionally, the racial minority and the white majority groups live in integrated neighborhoods in the municipality, as measured by the index of dissimilarity. The findings are that there are several municipalities where a minority group has reached geographic racial equality in metro Detroit despite the fact that the metropolitan area as a whole reveals extreme racial inequality and racial residential segregation.

PRIVATE INFORMATION AND AGENT EXPERIENCE IN NFL CONTRACT NEGOTIATIONS

Joseph Orsini

Mentor(s): Mike Conlin (Economics)

This paper examines the benefits of using an experienced agent in National Football League (NFL) contract negotiations. We empirically test the effects that agent experience, measured by the number of players that an agent represented during the sample period, has on a number of contract parameters. Specifically, we look at the effects that an agent's experience has on the proportion of his client's contract's value that is guaranteed, the length of the contract, whether it is signed before the official start of training camp, and whether the contract includes an incentive clause. In this analysis we control each player's selection number in the draft, their position, the team they were drafted by, that team's standings in the year prior to their being drafted, and the tenure of the team's head coach. We also include dummy variables for the round and year in which the player was drafted and whether or not the player attended a Division IA school. Our results indicate that an experienced agent knows how to better exploit the existence of private information to negotiate a more favorable contract for his client than his less experienced colleagues.

ETHICAL ISSUES IN UMBILICAL CORD BLOOD COLLECTION

Kellie Owens, Katelin Friederichs, Britt Hegarty, Kelly Krcmarik, Benjamin Morris

Mentor(s): Mark Largent (James Madison College)

Rich in adult stem cells, blood extracted from the umbilical cord, commonly called cord blood, is already being used to save thousands of lives. Cord blood is collected from the umbilical cord immediately after a child is delivered. Cord blood is currently used to treat patients with leukemia and lymphoma, and research to use cord blood for other illnesses looks promising. Parents can choose to store their child's cord blood in either a public or private bank. Public cord blood banks supply cord blood to be transplanted from an unrelated donor to a patient in need. Private banks charge parents to store cord blood exclusively for their family. Based on our research of these two collection methods in the Lansing community, we can conclude that ethical concerns arise in both systems. Even though the establishment of public cord blood banks is increasing, many communities lack the financial and technical resources to support and maintain a public bank. The high cost of private cord blood banking makes it a privilege that is not afforded to every family, and unlike public banks, only the family whose blood is stored may use it for transplant. Many private cord blood banks have been accused of over exaggerating the chance that cord blood will be used by an individual family. Our research highlights why one type of collection may be preferred and also addresses the ethics of cord blood collection as a whole.

EVALUATING HEIRLOOM TOMATO VARIETIES FOR THE PRESENCE OF THE GREEN FLESH MUTATION

Priyanka Pandey

Mentor(s): Cornelius Barry (Horticulture)

The 'gf' mutation lacks the ability to degrade chlorophyll, leading to brown-fruited varieties. We have identified the gene corresponding to 'gf' as a homolog of the stay-green protein from rice. We have designed a genetic marker to distinguish the 'gf' mutation. We are using this marker to screen a collection of heirloom tomato varieties with phenotypes similar to 'gf,' in order to determine the genetic basis of these varieties. Possible findings include that all heirloom varieties contain the same mutation, new alleles in the 'gf' gene will be discovered, or that the phenotypes of heirloom varieties are due to a mutation in a yet-unidentified gene. The current progress will be presented.

DROSOPHILA MELANOGASTER

Andrew Para

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

As one of the pioneering organisms in genetic research and discovery, the fruit fly is hardly looked at in-depth. Using the SEM on campus, my presentation will provide the audience with a close-up view of the drosophila fly and its famous body parts that have helped shape the present-day image of allelic exchange.

MARGINAL CONGRESS MEMBER SPONSORSHIP BEHAVIOR IN COMMITTEE POSTS

Benjamin Parmet

Mentor(s): Paul Abramson (Political Science), Matthew Grossmann (Political Science), Brian Silver (Political Science)

David Rohde contends that the main goal of any congressman is reelection. A member with weak constituency support should pay close attention to the desires of his voters if he wishes to remain in power. Classic research by Jacobson, Rohde, and others has supported this notion. Should students of political science simply assume a marginal member's actions will always be congruent with the wishes of his constituency?

This project examines the sponsorship and cosponsorship behavior and successes of marginal vs. non-marginal committee members in both the House and Senate in the 107th-109th Congresses. Variables including seniority, ideology, party, and chairmanship are tested to examine the depths of any effects marginality may have over sponsorship in committee.

A META-ANALYTIC REVIEW OF THE ROLE OF FIRM STRATEGIC ORIENTATIONS ON FIRM PERFORMANCE

Ashley Payton

Mentor(s): Ahmet Kirca (Marketing)

The impact of firm strategic orientations on firm performance has attracted considerable research attention in the extant literature. Researchers from various disciplines, including international business, management, and marketing have investigated the performance implications of the firms' strategic orientations (e.g., market orientation, customer orientation, competitor orientation, learning orientation, innovation orientation, entrepreneurial orientation) over the last three decades. Given the diversity of perspectives and findings, a thorough quantitative summary of this research stream through a meta-analysis is vital for advancing research and practice. The objective of this project is to investigate the relative impact of various strategic orientations on firm performance. Moreover, in this project we also focus on the effects of study characteristics (i.e., performance measures, industry context, geographic setting, firm size) that affect the magnitude of the pairwise associations between various strategic orientation and its performance outcomes. Overall, the findings of the meta-analysis quantitatively summarize the extant literature on strategic orientations and they offer a number of suggestions for future research that have important theoretical and practical implications.

COLLEGE STUDENT VIEWPOINTS ON NATURAL AND ARTIFICIAL MATERIALS

Jade Pearce

Mentor(s): Craig Harris (Sociology/National Food Safety/toxicology Center), Maryhelen MacInnes (Sociology)

Abstract: For an enrichment and school project I asked the questioned the policy on for recycling on the Michigan State University Campus and wondered about college student viewpoints on grocery bag use and recycling habits. Using a voluntary survey sent via online, I received close to 40% response rate to acquaintances where on average the typical college respondent was 21 years old, on average brought home 5-6 grocery bags and on average men were more eco-friendly than women when it came to dispose of grocery bags. Upon further study, I created an informal interview with five of the respondents. On average all five recycled to some degree and despite different motives for recycling, all expressed the reason why it's hard to recycle on campus is the lack of convenience and lack of recycling locations.

STEEL: HOT METAL, COLD REALITY

Amanda Peterka, Alex Henderson

Mentor(s): Howard Bossen (Journalism), Eric Freedman (Journalism)

Steel defined the industrial age, as both a material and a way of life for the workers who built the industrialized world. Chronicled over the years by many photographers, steel's importance lives on through their images, even with the decline of the steel industry in the United States. The planned international 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 photographs, this project also includes two books and an audio and visual collection. Our responsibilities in this project include, but are not limited to, background library, documentary and Internet research, development of bibliographies and databases, organization of potential images, assembly of grant proposals and collection of oral histories.

THE EFFECT OF DEMOGRAPHICS AND ACADEMIC BACKGROUND ON KNOWLEDGE OF INTERNATIONAL AFFAIRS

Kelly Phelan, Alicia Levere, Adair Whalen

Mentor(s): Dan Kramer (Fisheries and Wildlife), Michael Schechter (James Madison)

We conducted a survey of undergraduate students with regard to their knowledge and opinions on international affairs. We are investigating the relationship between academic and demographic background and knowledge of international affairs. We hypothesize that students with higher GPA's and have taken more classes with an emphasis on international affairs will score higher on the knowledge questions. We also hypothesize that students from urban areas will also score higher on the knowledge questions compared to students from rural areas.

OPPORTUNITIES FOR ALTERNATIVE ENERGY EDUCATION IN MICHIGAN SCHOOLS K-12 COMPARED TO NATIONAL AND INTERNATIONAL STANDARDS

Ben Phillips

Mentor(s): David Johnson (Fisheries and Wildlife)

Learning about scientific explanations of the world around you is a crucial skill needed as an adult, and being able to reason with the news media's translation of scientific information has become more important with the advent of alternative energies. Science education in K-12 school systems is commonly thought to create a foundation which provides a scope for students to see through the push and shove of politics. Now that many new alternative forms of energy are surfacing simultaneously, modeling curriculum to explain this quickly changing industry can lead to miscommunication and misinterpretation of scientific findings. What I looked at was how content standards that could be taught using examples of alternative energies were suggested at international, national, and state-wide levels and employed at the local level. Teachers need to fulfill their state science requirements and young people need be taught how to analyze their impacts on the globe. The solution could be as easy as creating lesson plans incorporating examples of alternative energy technologies and ideas, or even the active use or creation of those technologies, to solidify the presence and use of these enigmatic innovations in young peoples' minds.

THE ATHENIAN EPHEBEIA IN PLATOS MENEXENUS

Mark Piskorowski

Mentor(s): Denise Demetriou (History)

This paper examines the origin of the Ephebeia, the military training of Athenian male youths (18-20 years old) that culminated in their admittance into the Athenian civic body. Before beginning their two years of service, the youths, epheboi, took an oath to honor their comrades and the city's laws, and also to defend their ancestral home, Attica. An inscription from the late fourth century B.C. and two similar copies recorded by later authors, Pollux (VIII 105 f.) and Stobaeus (IV 1.8), provide the Greek text of this oath. While there is no direct evidence for the Ephebeia before the latter part of the fourth century B.C., I hope to show that Plato's Menexenos contains phrases that are similar to the Ephebic Oath. This suggests that Plato, who wrote in the early fourth century B.C., knew the content of the oath. Since Plato's references to the oath are, at best, passing, in order for his audience to appreciate them, the Ephebeia must already have been a well-established institution. If this hypothesis is accurate, then the origin of the Ephebeia can safely be moved back a century into the late fifth century B.C., when Plato was a youth. Furthermore, the content of the oath, as well as Plato's references to it, have implications for 5th-century Athenian civic ideology: the Athenians constructed their identity based on the concept of autochthony, the idea that Athenian citizens had occupied the same land, from which they were literally born.

MILITARY AUTHORITARIANISM: CONSTITUTIONAL DEMOCRACY IN THAILAND

Alexander Plum

Mentor(s): Rita Kiki Edozie (James Madision College), Ross Emmett (James Madison College)

My honors thesis critically examines the Thai constitution and its historical accommodation of the military in the political arena. I make suggestions for a new institutional arrangement within the Constitution to check the power of the military and remake the way for democratic consolidation.

CUSTOMER RELATIONSHIP MANAGEMENT SOFTWARE ANALYSIS

Nicole Poppe, Lisa Devereaux

Mentor(s): Regina McNally (Marketing)

As has been documented extensively, the implementation of customer relationship management (CRM) software often fails to meet project objectives. Various reasons for poor results have been offered, including business process analysis errors, under-involvement of users and developers, and a poor understanding of the benefits of CRM implementation. The true challenge in CRM implementation is not in software deployment, but rather in getting the call-center agent to understand why the software is important, why it builds relationships, and why it will help bottom-line revenues. User acceptance is necessary because the success of a CRM project hinges on end users adopting the system and entering the data. This research investigates call center agent perceptions of CRM software implementation projects that impact their acceptance and use of the system, ultimately impacting firms' abilities to service customers. Fifty-eight interviews of call center agents, supervisors, managers, and support staff in the automotive and banking industries were conducted. The results of the analysis of the interview data are presented in this report.

THE MEDIATING ROLE OF TRUST ON THE CREDIBILITY OF ONLINE RETAILERS AND CONSUMERS PURCHASE INTENTIONS

Margaret Powers

Mentor(s): Constantinos Coursaris (telecommunications)

This project explores the effects of various design aspects among others on the usability of websites and the subsequent trust that results.

VALIDITY OF THE OMNI RPE SCALE ACROSS A WIDE RANGE OF PHYSICAL ACTIVITIES

Tiffany Prout

Mentor(s): Karin Pfeiffer (Kinesiology)

Perceived exertion is the ability to detect and respond to physiological sensations derived during exercise behavior. Several scales that assess rating of perceived exertion (RPE) exist. Most studies examining the validity of RPE scales have involved treadmill and cycle ergometer exercise, due to lack of portability of machinery. Recently, portable metabolic technology was developed; most RPE scales have not been tested across the variety of activities that portable metabolic systems provide. The purpose of this investigation was to examine the validity of the OMNI RPE scale over a range of physical activities. Participants were ten males (n=7) and females (n=3), ages 6-15. All participants/parents signed assent/consent forms, and the study was approved by the MSU Institutional Review Board. Participants performed a handwriting task, computer games, laundry task, ball toss, sweeping, slow walk, brisk walk, brisk walk on the treadmill, aerobics, basketball, and running. During each task, participants wore a portable metabolic analyzer, which collected expired respiratory gases. Each task was performed for five minutes, and the last two minutes of each activity were used for analysis. Pearson correlations were used to assess the relationship between RPE and energy expenditure (VO2). The correlation between VO2 and RPE was $r=0.32$ ($p<0.01$), and between VO2 relative to body weight and RPE was $r=0.43$ ($p<0.01$). There were not enough data points to examine RPE separately by activity. RPE and energy expenditure were moderately related; data collection is still in progress.

PERIOD CHANGES OF TYPE II CEPHEID VARIABLE STARS: WATCHING STARS EVOLVE

Katherine Rabidoux

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

Type II Cepheids in globular clusters have long been observed photgraphically, but the light curves of many cluster Cepheids have not been defined using recent CCD photometry. We present new CCD BVI light curves for Type II Cepheids in the globular clusters M3 and M5. The observed period changes of Type II Cepheids can in principle provide information on their direction of evolution through the instability strip. We examine the long term period changes of three type II Cepheids in the globular clusters M3 and M5. V42 in M5 has shown a small decrease in period since 1889. V84 in M5, which shows a more erratic light curve, appears to show irregular fluctuations in period. V154 in M3 shows a recent increase in period. Preliminary results are presented for period changes of Type II Cepheids in the globular cluster M14.

BIOSYNTHESIS OF GOLD NANOPARTICLES

Romali Ranasinghe

Mentor(s): Evangelyn Alocilja (Biosystems 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. They have also been found to have antibacterial effects (Duran et al, 2007). 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. The actinomycete T. curvata was selected as a bio-nanofactory due to its extracellular gold reduction, which facilitates nanoparticle extraction. 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. Using a modified methodology from Ahmad et al (2007), T. curvata were cultured for 5 days, harvested, and the mycelia incubated in AuCl4 solution for a further 5 days. The solution turned from pale yellow to an increasingly dark purple, as the actinomycete reduced the AuCl4– to Au nanoparticles. UV-vis spectrum measurements showed an absorbance peak at 537nm, which according to previous publications, corresponds to nanoparticles in the range of 20–30 nm. In order to reduce nanoparticle size, we are at present carrying out optimization assays to determine the effect of varying pH, temperature and growth medium on particle size and shape.

A CHEMICAL DERIVATIZATION AND MULTISTAGE TANDEM MASS SPECTROMETRY BASED STRATEGY FOR TARGETED PHOSPHOPROTEOME ANALYSIS

Katherine Rank

Mentor(s): Gavin Reid (Chemistry)

Protein phosphorylation plays a key regulatory role in the maintenance of protein function. However, the utility of mass spectrometry based approaches increasingly being employed for the efficient identification, characterization and quantitative analysis of phosphopeptide ions contained within complex proteolytically derived peptide mixtures are often limited by low phosphorylation stoichiometry, incomplete peptide coverage after enzymatic digestion, and the poor fragmentation patterns observed following multistage tandem mass spectrometry (MS/MS and MS^3), where the ability to identify and characterize a given phosphopeptide is highly dependent on the peptide sequence and precursor ion charge state. Here, we describe a novel approach for the 'targeted' identification of phosphoserine- and phosphothreonine-containing peptides, by replacement of the phosphate group with either an ammonium ion- or sulfonium ion-containing derivative in a one-pot β-elimination/Michael addition reaction. The introduction of these 'fixed charge' derivatives results in the ability to control and direct the low-energy CID-MS/MS fragmentation behavior of these peptides toward the formation of a single 'diagnostic' product ion, corresponding to the loss of either trimethylamine or dimethylsulfide, thereby allowing their selective identification from within a complex mixture. Subjecting the initial product ion to further dissociation (MS^3) then enables additional sequence information to be obtained for detailed characterization of the modification site.

AN UPPER PENINSULA OF MICHIGAN VOWEL SYSTEM

Wil Rankinen

Mentor(s): Dennis Preston (English)

In the Upper Peninsula of Michigan there is a possibility of a lingering influence of Finnish among persons who are no longer speakers of Finnish but whose English is still distinct. This report is based on a 68-person sample stratified by age (young, middle and old), sex, and social status (middle and working). Among the older respondents, there are three subsets: 1) speakers whose first language is Finnish, 2) bilingual speakers in Finnish and English from birth or a very early age, and 3) English speakers with little or no knowledge of Finnish. The middle aged and younger respondents have little or no Finnish language competence.Respondents were recorded in sociolinguistic interviews that included a word list, reading passage, and casual conversation. These data reported here are drawn from the word list and reading passage sections. The acoustic characteristics of these speakers vowels were determined spectrographically. The vowel systems of the speakers were plotted in acoustic space to reveal if a retained Finnish, a Canadian, an older regional, or a newer regional influence has been a factor in the

arrangement of the speaker's English vowels. These data have also been normalized so that differences in demographic characteristics (age, sex, etc.) can be directly compared and so that larger numbers of speakers can be pooled to show community norms. Preliminary analysis shows a Canadian influence, although contribution from the Finnish system in the configuration may exist. Further analysis will reveal how these developments show up in the different subgroups studied.

ORGAN DONATION: A COMPARATIVE STUDY

Haritha Reddy, Kurt Bjorkman, Ryan Heinhuis, Jinweon Won

Mentor(s): Mark Largent (History)

The complexities of organ donation transcend cultural, economic, political, and ethical controversies. The purpose of our research was to dissect these issues, exposing possible changes that the United States can make to improve national organ donation rates. By means of a comparative study between the United States, England, and Spain, we were able to identify the main factors conducive to rates of deceased donation. While the United States and England have very similar policies, the United States and Spain differ greatly. We explored the differences in development of each country's organ donation program. We also investigated how religion and socioeconomic factors influence the general public's opinion of organ donation. Other aspects researched include the role of each nation's health care system, the population's trust in the medical community and the legal and ethical definition of death in each country. It is evident that each of these factors plays a significant role in the programs of all three countries researched. This would imply that by making changes related to any of these issues, organ donation in the United States has potential to grow.

AFFECTS OF LEVEL OF INVOLVEMENT IN 3-D ADVERTISING ON PURCHASE INTENTION

Allison Ribble

Mentor(s): Constantinos Coursaris (Telecommunication)

Internet advertising has experienced many changes since its 1994 onset (Li, Daugherty & Biocca, 2002). With increased internet usage and accessibility, advertising has become more advanced and specialized to reach target markets with developments like 3-D advertising that are have created new consumption experiences in virtual environments. Through the adoption of 3-D advertising, advertisers can create engaging experiences to stimulate purchase intention (Li, Daugherty & Biocca, 2002). Hassanein and Head (2007) suggested higher levels of presence create more favorable attitudes in an online shopping experience. Li, Daugherty and Biocca (2002) showed a positive relationship between 3-D advertising and its effects on presence and purchase intention. Park, Lennon and Stoel (2005) validated a positive relationship between mood and purchase intention for online product presentation. Song, Fiore and Park (2007) proved positive relationships between presence and shopping experience and between shopping experience and purchase intention. Kim, Fiore and Lee (2007) experimented with involvement levels of an online shopping experience on purchase intention. They validated a positive relationship between level of involvement and purchase intention. With respect to these validated relationships, these hypotheses are proposed to expand on awareness 3-D advertising has on purchase intention: H1. Higher involvement (3D) positively impacts shopping presence; H2. Higher involvement (3D) leads to higher levels of purchase intention; H3. Greater presence results in favorable moods/attitudes while shopping; H4. Higher levels of presence results in increased shopping enjoyment ; H5. More favorable moods/attitudes increase likelihood of purchase intention.; H6. Higher levels of shopping enjoyment increases likelihood of purchase intention.

SEM-ANALYSIS OF DIFFERENT FIBERS AND FORENSIC APPLICATION

Emily Riddell

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

The purpose of this project is to analyze the differences between fibers and determine identifying characteristics of each kind. Different types of materials serve different purposes and therefore are made differently. The organization of the individual fibers and the material of which they are made contribute to this difference. This project will look into the structural differences between these characteristics as well as ways to distinguish them. Cotton, for example, is made of thin, round fibers that can be woven into a strong material. The analysis of these fibers will be done using a Scanning Electron Microscope and acquisition software to capture the image. The magnification that is used will allow both the shape of the fibers and the overall organization to be observed. The differences in the structure of materials are important to forensic scientists who have to identify an unknown material during an investigation. Fibers are easily transferred between people and objects and need to be

identified to find either a suspect or locate a victim. The identifying characteristics allow scientists to easily differentiate between the fibers.

COMPARING BRAIN ACTIVATION BETWEEN READING STORIES AND SOLVING MATH PROBLEMS USING FMRI

Chris Riedinger, Doug Darden, Alex Jendrusina

Mentor(s): Jie Huang (Radiology)

By measuring the blood oxygenation level dependent magnetic resonance imaging signal changes related to neural activity in the brain, the difference in brain activation between reading stories and solving math problems could be determined. Six right-handed students (3 females and 3 males with ages of 18-22) participated in the study. The study consisted of four functional MRI scans; each scan consisted of eight trials. Each trial consisted of reading two passages for 9 seconds each or solving three math problems within 18 seconds; trials were interrupted by an 18 second fixation period. The reading passages were separated into two categories: emotional and unemotional. The math trials were divided into basic algebraic and arithmetic problems. The order of the trials was randomly presented, and the answers to the math problems were recorded.

The data from each subject was analyzed using the program AFNI. The data from each trial was sorted out first and then averaged to reduce noise, which allowed the experimenters to more accurately analyze the data. Data indicates that both reading and math tasks produced robust BOLD-MRI signal changes in the visual cortex. However, the reading tasks showed almost twice the amount of activity in comparison to the solving math tasks, consistent with the more visual stimulation from the reading tasks. Comparison of signal changes in other areas of the brain allowed more connections to be drawn between activation levels of different regions and the tasks associated with them.

HIGH SCHOOL BULLIES

Samantha Rinke, Laura Aughton, Jacob Peacock, Kathleen Scheuber

Mentor(s): Suzanne Cross (Social Work)

Our poster represents background information on who bullies, gender differences, why they bully and how. It also shows a summary of our research as it relates to profiling bullies and methods of bullying. We will also present our conclusions based on this data.

MSUU

Svetlana Rivkina

Mentor(s): Robert Albers (Telecommunication)

A student run program that connects students to Michigan State University's college life.

ROCKETBALL

Charles Roman, Michael Jeffery, Bryan Sandford

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

Rocketball is a 3-D digital media project made in Torque Game Engine. The project is a marriage between a First-Person Shooter (FPS) and a sports game. It is named Rocketball because you, the player, are the ball and must propel yourself, with rockets, through the game's hoop. Each game is a three versus three struggle to score points and defend the hoop from the other team. The game features four unique powers, game commentary, artificial intelligence players, network playability, and multiple arenas.

MISSING CONNECTIONS IN GLOBAL CHANGE

Sam Rossmans

Mentor(s): Julie Libarkin (Geology)

Global change in the Earth system is characterized by a variety of different phenomena. These Phenomena occur in multiple spheres (lithosphere, atmosphere, hydrosphere, biosphere) and are interrelated across spheres. Patterns in global change are often difficult for students to comprehend, for this reason, a study was undertaken to determine student conceptions and misconceptions in global change. A survey of students in a non-major earth science class was conducted. Students constructed four timelines that represent the four spheres of the earth system. Each event on each of the student's timelines was measured and placed into a categorical database. The data were then analyzed by a variety of statistical measures to determine trends

and patterns of student thought. Initial results indicate that student conceptions of global change are largely fragmented specifically in the context of the lithosphere and biosphere and contain many contradictory ideas that are likely inhibitory to student learning.

HOW DO PARENTS APPROACH QUANTITATIVE BOOKS WITH THEIR PRESCHOOLERS?

Christina Russell

Mentor(s): Kelly Mix (CEPSE)

Previous research has suggested the most effective way for preschoolers to connect counting and cardinality is to count and label sets presented to them. While we know that this is an effective method, we do not know if parents use this method when reading quantitative trade books to their preschoolers. We presented 15 parent-child dyads with a quantitative trade book and a nonquantitative trade book to see how parents would approach number concepts. Our hypothesis is that parents are not using the most effective method of counting and labeling the number sets, but rather addressing number in a more interactive way (through encouragement) or that they are not even talking about number. In the end, our hypothesis was correct. The nonelaborative parents simply read directly through the text and the more elaborative parents briefly discussed number, encouraged the child to count or talked about nonquantitative aspects of the book.

CHARACTERIZATION OF STARDUST DROPLET SIZE DISTRIBUTION

Nathan Sanders

Mentor(s): Michael Velbel (Geology)

Hypervelocity impacts of dust particles from the comet 81P/Wild 2 at 6.1 km/s relative velocity produced millimeter-scale debris tracks as the particle was brought to rest in the NASA Stardust mission's aerogel capture frame. Kinetic energy conversion during the impact completely melted approximately one half of the particle fragments. Solidification of the molten material after capture produced an emulsion of metal-sulfide droplets in silicate glass. Previous investigators have expressed concern at the low proportion of sulfur detected using X-ray fluorescence methods and suggest that the majority of the element may be bound in droplets too small for detection by that method. This study examines the along-track droplet size distribution using five sample allocations from known positions along a single Stardust track. Representative TEM images from each sample have been acquired. An automated size distribution analysis process is being developed to characterize the relative proportion of particle sizes in each allocation. The results are intended to determine the typical distribution of particle sizes and whether there is a distinct along-track variation.

EXCAVATION OF HISTORIC MAC FACULTY ROW HOUSING COMPLEX

Nathan Sanders

Mentor(s): Lynne Goldstein (Anthropology)

Faculty Row was built in 1857 to accommodate professors at the Michigan Agricultural College. Only the Cowles house remains of the Row; the other homes were destroyed in 1947, replaced by Gilchrist, Landon, and Yakeley Halls. The archaeological site of the former faculty houses will be disturbed in the early summer of 2008 during a planned infrastructural construction project. Geographic information systems are being employed to locate the exact position of each house using historical maps from the MSU Archives. Additionally, archival research is being conducted to better understand the structures of the buildings, their relationship to the rest of campus, and their place in the history of Michigan State University. This study will consult occupants' diaries and other archival documents of one of these houses which is to be significantly disturbed by the construction in preparation for the April, 2008 excavation of Faculty Row. An outline of the excavation and preliminary findings will be reported.

THE ROLE OF RENEWABLE ENERGY ON COMMUNITY SELF-RELIANCE

Lisa Savalli

Mentor(s): Rene Rosenbaum (CARRS)

The object of this research is to conduct a survey of company executives in the renewable energy industry to provide a better understanding of their impact on the Michigan Economy and the challenges and accomplishments of the business.

THE CHANGING FACE OF THE UNITED STATES BORDER PATROL

Kelly Savel

Mentor(s): Anna Pegler-Gordon (Social Relations and Policy)

The United States Border Patrol has changed immensely in the post 9/11 world. They have moved from INS to the Department of Homeland Security and have received a higher budget and are currently employing many more agents than in the past. Unfortunately much of the research done on the Border Patrol has been previous to 9/11. There is a real need for new research that examines the new environment and lives of the agents. I wish to add to the current research by doing oral histories of Border Patrol agents in the San Diego area. These histories would prove a useful addition to the current research by offering an on the ground perspective to the new changes. More specifically I want to look at what impact having more Mexican Americans as agents has had on the Border Patrol. This mostly overlooked change marks a stark contrast to the earlier days of the Border Patrol when the force was primarily made up of Anglo Americans. This project seeks to understand the impacts of the change and what it means for the Border Patrol today and in the future.

ANTI-MULLERIAN HORMONE IN HEIFERS WITH HIGH VERSUS LOW NUMBERS OF ANTRAL FOLLICLES GROWING DURING OVARIAN FOLLICULAR WAVES

Danielle Scheetz

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

Animal scientists continue to grapple with the question, "How do you predict fertility of an animal?" Measurement of Anti-Müllerian Hormone (AMH) in the blood of cattle may answer this question. AMH is produced by small ovarian follicles and is involved in regulation of follicular growth. Current studies in women and mice show that AMH levels decrease with age coincident with the decline in healthy eggs and follicles in ovaries. My study's first objective was to develop an assay to measure AMH in serum and follicular fluid of cows using a commercial human AMH kit. After validating the assay for use in bovine and determining that AMH was present in serum and follicular fluid, blood was collected from cattle to measure AMH concentrations. In this study, cattle were classified in two groups based on number of follicles determined by ovarian ultrasonography. The groups of animals were classified as High (> 25 follicles,) vs Low (< 15) based on number of antral follicles during ovarian follicular waves. My second objective was to determine concentrations of serum AMH in relation to the number of ovarian follicles growing during the estrous cycle. It was determined that concentrations of serum AMH were four and a half-fold greater in animals with high numbers of antral follicles compared to animals with low numbers of antral follicles. Since cattle with High vs Low follicle numbers have more eggs in ovaries, the results imply that measurement of AMH may be useful to predict fertility in female cattle.

YOUTH BULLYING: THE VICTIMIZATION

Erin Scherer, Varun Paranjpe, Valerie Rygiel

Mentor(s): Suzanne Cross (School of Social Work)

Bullying in High School can have devastating effects on the victims. Research on the victims of High School bullying uncovers the various reactions to bullying across different cultures, races, and genders.

AFFECT OF PROTEIN ON AMMONIA EMISSIONS IN VITRO

Elizabeth Scheuing, Christine Kostesich, Elizabeth Thome

Mentor(s): Nathalie Trottier (Animal Science)

Excessive amounts of protein in an equine diet result in increased ammonia excretions, and for a country concerned with the environmental pollution arising from livestock operations, this gives rise to an important issue. This study aims at determining a nitrogen excretion profile from horses fed different levels of protein, and examining the environmental impact of ammonia emissions, while also ensuring the health of the horse. The specific objective of this group is to study the effect of different protein levels on ammonia emissions in vitro. Six Arabian geldings from the Horse Teaching and Research Center, selected for similarities in age, performance level, and size, were used for this study. Six two-week feeding periods with six different diets, based on protein content, were determined using a 6 x 6 Latin square design. Total fecal and urine output was collected during the last three days of each feeding period. Fecal and urine samples from horses fed the three different cuts of alfalfa and the grass hay will be used to specifically measure ammonia emission rate in vitro. Using the volume of urine and mass of feces excreted by every horse over three periods, a mean ratio of feces to urine was calculated. Urine and feces samples will be

mixed in a flask and allowed to ferment for a standardized amount of time, followed by measurements of temperature and ammonia emission at regular intervals. The assay and data collection is currently underway.

WE SHALL NOT SURRENDER: KENNEDY, THE BERLIN CRISIS, AND THE EFFECTIVE USE OF THE RHETORICAL PRESIDENCY

Jessica Schoenherr

Mentor(s): Benjamin Kleinerman (Political Theory and Constitutional Democracy)

President John F. Kennedy entered the White House in January 1961 without a national mandate. Three months later, he lost international standing after the failure of the Bay of Pigs invasion and received an ultimatum on Berlin from Soviet Premier Nikita Khrushchev. Khrushchev saw Kennedy as a weak leader and wanted to take advantage of the situation by threatening access to routes to West Berlin. When Kennedy attempted to show strength, his lack of power nationally and internationally prevented action. Wanting to protect American interests in Berlin and to show the international community that the United States was not weak on international matters, Kennedy went directly to the public to gain support for his plans. In an example of how to best deal with the contrasting jobs of leading public opinion and following it, President Kennedy did both, convincing the American public that if they supported him in a hard-line stance against the Soviet Premier, he would follow their interests and protect American interests from communism. With their support, Kennedy created a strong international persona for himself and eventually gained the respect of Khrushchev. The respect from Khrushchev translated to negotiating power and Kennedy used that negotiation power to prevent nuclear war during the Cuban Missile Crisis of 1962.

TERRESTRIAL WEATHERING OF EUCRITIC ACHONDRITIC METEORITES

Laura Schroeder

Mentor(s): Michael Velbel (Geological Sciences)

To determine the effect of terrestrial weathering on eucritic achondritic meteorites, differences between the interior and exterior elemental compositions of the eucrite EET79004 were observed. Recovered near Elephant Moraine in Antarctica, eucrite EET79004, originating from a main-belt asteroidal parent body, has a thin layer of fusion crust remaining at its surface. Two petrographic thin sections, one containing this coating of fusion crust at the exterior and the other located within the interior, were prepared for elemental mapping by means of scanning electron microscopy and energy dispersive spectroscopy. Analysis of fractures within the interior thin section 64 indicated no signs of weathering. Veins present within the exterior thin section are occupied by calcium as well as sulfur, the latter an element absent from the interior section of the eucrite. Areas near the fusion crust of the exterior thin section 59 contain an enriched abundance of calcium sulfates in comparison to the interior portion of EET79004. Providing further support for the possibility of terrestrial weathering is the presence of the calcium sulfates within vesicles that formed in the fusion crust upon passage through the earth's atmosphere. Terrestrial weathering must have allowed for the precipitation of calcium sulfates in these vesicles after Earth-arrival. Absent from the interior portion of the eucrite, such calcium sulfates indicate that terrestrial weathering must have occurred at or just beneath the fusion crust. Antarctica's influence upon meteorites after contact with earth may lead to clues about weathering on Mars.

RECYCLING IN MICHIGAN

Erin Seavoy, Jennifer Copus, Erik Jonasson

Mentor(s): Mark Largent (James Madison)

Within our culture, recycling is seen as an important way in which we can help preserve our wildlife and protect the earth for our children's future. With this positive reputation and strong public interest it would be reasonable to believe that recycling programs are widely supported and funded throughout the state of Michigan. However, this is not the reality. Within our research we plan on investigating three prominent Michigan cities, Lansing, Detroit and Ann Arbor. Each city has its own recycling history and we are delving into the legislation and statics surrounding the emergence, or absence of a recycling program in each city. We hope to discover trends which point to why some cities have become more involved in the recycling phenomenon. We seek to determine what types of economic, social and political conditions are necessary in order for a city to introduce and fund a comprehensive recycling program.

CREATING A WEB BASED TUTORIAL FOR COMMUNITY HEALTH WORKERS

Alycia Sedlacek, Lucan Chatterley, Dae Choi, Courtney Fohlbrook, Elyse Hahn, Anna Johnson
Mentor(s): Tedra Jackson (Obstetrics, Gynecology and Reproductive Biology), Karen Williams (Obstetric, Gynecology and Reproductive Biology)

Online tutorials are becoming more prevalently used among schools and employers, and they have a proven success rate for educating people about specific topics. In order to reinforce the cancer education training of community health workers for medically underserved minority women in the Detroit Metro area, we sought to develop a web based tutorial to supplement areas of training that the workers viewed themselves as deficient in. First, we developed a telephone survey to assess community health workers' existing breast and cervical cancer knowledge and computer proficiency. The survey included questions about general computer usage and about community health workers' previous cancer education training. Calls were placed to thirty community health workers, and a 33% response rate was achieved. After tabulating the survey results, we found that the majority of participants have access to computers, and all rated themselves at least 3 on a scale of 1-5 for comfort of computer usage. The respondents reported being frequently asked questions such as; how to perform a breast self exam and at what age to get a mammogram. Additionally, they requested more information about cervical cancer. Based on these responses, we researched published cancer information and compiled a tutorial aimed at further educating the community health workers on general cancer, cervical cancer, breast cancer, and various cancer prevention and treatment options. The information gained from this study should be able to aid in the development of future breast and cervical cancer education train-the-trainer programs.

IMPACT OF IFNG ON BONE LOSS IN DIABETIC MICE

Raymond Seese
Mentor(s): Laura McCabe (Physiology)

Microcomputed tomography (μCT) is a commonly used as a biomedical research imaging method. Using as many as 760 individual two-dimensional x-ray images taken along a single axis of rotation, the μCT creates a three dimensional image of the interior of an object or hard tissue, such as bone. This study used μCT analyses to examine the effects of Type I diabetes on the bones of mice. Bone loss is a serious complication of Type I diabetes that contributes to increased risk of fractures, which are harder to heal in these patients. To induce diabetes we injected mice with streptozotocin, a chemical that is toxic to insulin producing beta cells. The (μCT) was used to compare the bone densities of the diabetic mice to controls. Additionally, diabetic bone loss was compared between wild type and interferon gamma (IFNγ) knockout mice. IFNγ is a cytokine that has been shown to be important in osteoblast and osteoclast formation. In both groups the diabetic mice had a significant decrease in bone volume fraction (BVF) compared to the controls. The IFNγ mice actually lost more bone than the wild type mice, indicating that IFNγ does not protect against diabetic bone loss.

EXAMINING URBAN TEACHER PREPARATION

Jeffrey Seguin, Chelsey Dunning, Evan Yamanishi
Mentor(s): Dorinda Carter (Teacher Education)

The purpose of this study is to explore how participation in the Urban Educators Cohort Program (UECP) prepares pre-service teachers for internship placements and teaching careers in urban schools. Specifically, this research investigation will examine how field experiences and classroom knowledge connect theory and practice to inform pre-service teachers' development of a.) a teacher identity, b.) the necessary dispositions (e.g., attitudes, behaviors, and beliefs) for effectively assuming future roles as teachers in urban settings, and c.) enhanced sociocultural awareness regarding urban contexts.

W.A.S.T.E

James Semivan
Mentor(s): Amol Pavangadkar (Journalism)

W.A.S.T.E is a series of 5 30 second PSA's which have been aired on WKAR and won first place at the Great Lakes Environmental Film Festival. They focus on the waste that is created by a large college campus. The research that was gathered for this project includes sources from within MSU. All of the footage was captured by students in and around East Lansing and edited by students. The five PSA's focus on the waste of Water, Paper, Plastics, Electricity and Plastics. The purpose of the PSA's were to

raise student and faculty awareness on how much material is wasted around campus and leaves it up to the viewer to do there part to help keep waste down on Campus and abroad.

PREPARATION AND CHARACTERIZATION OF PELLETED CARBON ELECTRODES

Jay Shah

Mentor(s): Doo Kim (Chemistry), Greg Swain (Chemistry)

A limitation of powderous carbon electrode materials, like those used as an electrocatalyst support for fuel cells, is microstructural degradation and high electrical resistance due to poor particle-to-particle connectivity. It is believed that forming the powders into pellets is a way to improve the electrical conductivity. Pure force is often not enough to hold the particles together to yield a mechanically stable electrode. Therefore, a binder that does not affect the electrochemical properties of the carbon must be used. The carbon powders to be studied in this work will be high surface area sp2-bonded Vulcan, medium surface area sp3-bonded diamond, and low surface area sp2-bonded Vulcite. Cyclic voltametric i-E curves will be measured in 0.5 M H_2SO_4 at room temperature to determine how electrically conducting the pellet electrodes are and what kind of microstructural stability they possess. The latter stability test will be done at 1.4 V vs. an Ag/AgCl electrode for 30-60 minutes. The results will be compared to literature work for the same materials. Based on these data, the suitability of the pellet electrodes for electrochemical studies will be determined.

CMEIAS 1X BIOFILM RESEARCH

Lei Shan

Mentor(s): Frank Dazzo (Microbiology)

Biofilm is an aqueous solution secreted by bacteria when aggregated together. Slides that have been for four days in the Red Cedar River will be analyzed with CMEIAS. The magnification for the slides will be 1x. CMEIAS is a computer program plug in for UTHSCSA ImageTool. It can analyze shapes as well as structures and spatial features of microbial communities. Some of its measurements include the morphology of bacteria, area, perimeter, roundness, compactness, aspect ratio and mean radius. There are five treatment groups which includes control, polylysine, polystyrene, EP and Spc Gold. The biofilm on the slide will have different CMEIAS calculations on each treatment. The goal of the project is to find a measurement features in CMEIAS that is useful for analyzing biofilm, as well as finding out useful variables in other image softwares.

INFORMED PARSING

Jefrey Shaw

Mentor(s): John Hale (Linguistics)

E xamples from Stabler 1988 are presented that are clarified by a more formal, automated parsing strategy.

MUSIC IN WORSHIP

Rachael Short

Mentor(s): Frederick Tims (Music)

The purpose of this study was to examine the role of active group music making within the context of a worship setting as a means to foster an increased sense of community within the group. Five volunteers from the First Congregational Church of St. Johns, Michigan met weekly for three 30-minute sessions of active prayer, music making and fellowship, respectively. Volunteers completed questionnaires targeting their feelings of and toward the group before and after each activity. While the results proved statistically insignificant, it is the opinion of the researcher that the premise holds promise for future research.

DO HENS HAVE A COLOR PREFERENCE FOR DUSTBATHING SUBSTRATE

Jennifer Sidge

Mentor(s): Janice Siegford (Animal Science)

Currently, there are 341 million egg-laying hens in the U.S.; over 90%are housed in cages possibly restricting behaviors and leading to decreased welfare. Understanding the needs of birds is critical to ensure that welfare is maintained. In the wild, hens dustbathe to remove excess lipids and ectoparasites. Dustbathing is considered a behavioral need of domesticated laying hens. This study aims to evaluate laying hens' preference for color of dustbathing substrate. Five hens were examined in an open-floor indoor system. A 10'x15' room was equally divided into four quadrants, each with a different color dustbathing substrate.

Wood shavings were used as the substrate and were dyed yellow, red, or blue using non-toxic food coloring. The shavings in the last quadrant remained natural. Behavior was recorded by video for five consecutive days, 12 hr/day from 0800-2000. Each time dustbathing and laying behavior was observed, bird identity and quadrant were recorded. The entire group was scanned every 15 minutes to record location of resting behavior. Data will be analyzed using a generalized linear mixed model. It is expected that more dustbathing and resting behavior will occur in the darker colored litter and birds will have no overall color preference when laying. This research serves as a starting point for understanding dustbathing substrate preferences of laying hens which will help to design welfare friendly housing systems.

THE EFFECT OF MARTINGALE REIN INSERTS ON HORSES BEHAVIOR

Nicole Smith

Mentor(s): Camie Heleski (ANIMAL SCIENCE)

We will have 3 treatments: control (standard snaffle bridle, no martingale), elasticized rein inserts (snaffle bridle, elastic inserts fitted between bit and reins), and martingale (snaffle bridle + martingale). During the first collection period, 6 novice riders (who have no prior information about potential pros/cons of the martingales/rein inserts) will ride 1 lesson horse from the MSU Horse Teaching & Research Center (HTRC) for each of the 3 treatments, which will be applied in random order. During the second collection period, 1 novice rider will ride 6 different lesson horses from the HTRC for each of the 3 treatments. For evaluating rein tension, force transducers inserted into reins that were developed and validated at the MSU McPhail Center will be used. Data are transmitted by telemetry to a computer and later analyzed by software already owned by the McPhail Center. Stress/frustration behaviors will be assessed and recorded based on methodology previously used1 . Two observers will record behaviors live so that inter-observer reliability can be checked. Video back up will also be recorded.

FOR THE LAST TIME, I'M NOT MEXICAN: MISCONCEPTIONS ABOUT HISPANIC AMERICANS

Patricia Smith

Mentor(s): Kristine Byron (Spanish and Portuguese)

Many Non-Hispanic Americans fail to make a distinction among the variety of Hispanic cultures that are part of America, many of which share little in common except language.

One manifestation of this oversimplification is the terminology average Non-Hispanic Americans may use. For example, many mistakenly refer to people born in Puerto Rico now living in the continental US as "immigrants," when in fact they have been American citizens all their lives. Also, many people overuse the term "Mexican" when referring to anyone who appears to be Hispanic. Furthermore, many do not accurately use terms like "Hispanic" and "Latino." Another aspect of immigration/migration that many fail to see as unique to each individual is his or her motivations for moving. One may come for political asylum or for educational opportunities. Another may come to escape harsh economic conditions or after prompting from the government arrangements like the Bracero program. Still others did not go anywhere, but became American citizens by government action, like those in what is now the American southwest. The reasons people move and the situation in their countries of origin greatly affect their ties, or lack thereof, to their home country, which in turn affects their behaviors and opportunities here. This project will discuss and evaluate distinctions among major groups of Hispanics who come to the continental US including but not limited to those from Mexico, Puerto Rico, and Cuba. It will examine what average Non-Hispanic Americans know about these groups and how that knowledge affects both parties.

THE TWO ARE REALLY ONE: THE SOCIAL AND POLITICAL IMPACT OF REGGAE AND HIP HOP MUSIC TO NEW WORLD AFRICANS

Princess Souvenir

Mentor(s): Jeffrey Wray (English)

Music has always been of great importance to African peoples throughout the African Diaspora. Since the 1970's, the cultural evolution of Reggae has paralleled significant shifts and changes in the social and political movements expressed through Hip-Hop music especially, but not solely, to the New World Africans; a term author Toni Morrison uses to describe non-African born blacks as "a new people, born on an American experience of survival, struggle and triumph". (Walker, 120). Developing out of two different sociopolitical environments, Reggae and Hip Hop have stemmed from a long African aesthetic tradition. By utilizing a comparative analysis; examining lyrics of prominent Reggae and Hip-Hop artist, including Buju Banton, the admiral Bob Marley, The Last Poets and Dead Prez; along with a close examination of previously conducted interviews of influential artists, this paper addresses several key questions: 1) What is the social and political impact of Reggae and Hip Hop on "New

World Africans" particularly in the urban East Coast and 2) What parallels can be drawn between the social and political implications of Hip-Hop and Reggae music?

STRUCTURAL ANALYSIS OF THE INFLUENZA VIRAL FUSION PROTEIN

Ryan Spencer

Mentor(s): David Weliky (Chemistry)

The "FHA2" domain of the influenza virus hemagglutinin protein is a 185-residue membrane protein that catalyzes fusion between viral and host cell membranes. Expression of this protein, as with many other membrane proteins, is typically difficult and results in low protein yields. This research has resulted in the development of two significant advances in the expression of FHA2 that are general enough to be transferable to similar membrane proteins. First, a shake flask fermentation method that increases the total cell density obtained and therefore increasing protein yield, and second a method for refolding inclusion body protein, a common byproduct of membrane protein expression. These advances have led to a final FHA2 protein yield of up to 20 mg/L. The refolding of inclusion body protein was determined through circular dichroism of the detergent solubilized protein.

ADVANTAGES OF MIIPS FOR TWO-PHOTON MICROSCOPY WITH ULTRASHORT PULSES

Kyle Sprague

Mentor(s): Marcos Dantus (Chemistry)

Two-photon microscopy is widely used because of its high intensity and narrow focal plane excitation resulting in a decrease in photobleaching and fluorescence scattering. Signal intensity in two-photon microscopy should be linearly proportional to the inverse of pulse duration. Although this property of two-photon excitation has been understood even before the introduction of this imaging method, systems are still using pulses of similar duration to those used at the introduction in 1990. Pulses used are usually around 100 fs in duration when systems capable of ultra-short pulses are no longer unaffordable. The reason that ultra-short pulses are not being used is that when they are used, higher chromatic phase dispersion is introduced when the pulse travels through a high numerical aperture objective. This high-order hinders the implementation of ultra-short pulses in two-photon microscopy. Using multiphoton intrapulse interference phase scan (MIIPS), high-order dispersion is compensated. Once the high-order dispersion has been compensated, ensuring transform limited (TL) pulses at the focal plane, the signal displays the expected increase in intensity. With the ultra-short pulses, less laser intensity is needed at the sample; the decrease in power decreases the damage to the tissue imaged. Once correctly optimized, ultra-short pulses will revolutionize the field of two-photon microscopy in biomedical imaging.

THE EFFECTS OF WOODLOT SIZE AND HABITAT ON THE NUMBER OF BIRD SPECIES WITHIN THE WOODLOT

Elizabeth St. James

Mentor(s): Henry Campa III (Fisheries and Wildlife)

As landscapes throughout the Midwest become urbanized, understanding how forest patch size, composition, and structure affect relative abundance and diversity of bird communities is essential for conserving biodiversity. Study objectives were to: quantify songbird communities on Michigan State University's Baker (24 ha) and Sanford (14 ha) woodlots during fall, 2007, quantify woodlot vegetation attributes influencing distribution, and describe how patch size and structure affect avian communities. Stratified systematic sampling was used to determine locations of bird survey points. Woodlots were classified as edge, interior, or wetland. Ten-minute point counts were used to quantify composition of avian communities in both woodlots. Bird species were identified by sight and sound and documented if present. Vegetation samples were taken 5m from point count locations. Six bird species were seen in Baker and Sanford respectively. Black-capped Chickadees (53.6%, 39.3%) and Red-breasted Nuthatches (41.1%, 25.0%) were most prominent. Overall, the three forest conditions evaluated (edge, interior, wetland) did not seem to influence the composition of avian species in the woodlots. This could be attributed to the similar size of the interior of Baker and Sanford (19.82 ha, 11.35 ha). The lack of difference between wetland and non-wetland areas could be explained by their relative size within their woodlot (Baker 0.73 ha and Sanford 1.39 ha) and, therefore, does not present a unique vegetation type for wetland bird communities. This study suggests that woodlot size and adjacent vegetation types are important factors shaping avian communities in urban settings.

AGE AND RACE DIFFERENCES AND THEIR RELATION TO THE UNDERSTANDING OF HEALTH ISSUES REGARDING CERVICAL CANCER

Sandte Stanley

Mentor(s): Karen Williams (Obstetrics Gynecology & Reproductive Biology)

In 2007 an estimated 11,150 women may be infected with cervical cancer. The most important factor about cervical cancer is that it is detectable through pap screenings and also curable if caught at an early stage. Cervical cancer is a slow growing cancer that mutates the cells around the cervix and if not caught at an early stage does have the potential to spread to other parts of the body. This study used questionnaires distributed by community health care workers to groups throughout Michigan participating in the Kin KeeperSM Cancer Prevention Intervention. The questionnaire analyzed the women's knowledge of cervical cancer with questions regarding screening behaviors and awareness.African American women and Latinas were used within the population. Age and race based on six factors were analyzed in an attempt to discover the barriers of screening behaviors and access or lack of information to these groups.

DEVELOPMENT AS EMPOWERMENT

Brett Staron

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

Economic development, until recently, has long been a laboratory for economists to test grand theories of growth and decline. However, the inadequacy of pure economic concepts to explain socioeconomic phenomena is as stark as ever. Taking this into account, this project uses multiple-regression analysis and other econometric techniques to unravel the social and political determinants of economic growth. In particular, it asks whether economic development requires a revolution of thought as well as social empowerment of the individual.

GUN201 ENCODES A TPR PROTEIN OF UNKNOWN FUNCTION AND DEFINES A NEW PLASTIDTONUCLEUS SIGNALING PATHWAY

Andrea Stavoe

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

Plastid signals help coordinate the expression of nuclear genes that encode proteins active in photosynthesis with the functional state of the chloroplast and help coordinate the expression of nuclear and chloroplast genomes. Because we know very little about plastid-to-nucleus signaling mechanisms, we cannot speculate on what types of molecules this form of signaling might depend. Therefore, we are taking a forward genetic approach to fill the gaps in our knowledge of this form of interorganellar communication. We have isolated new genomes uncoupled (gun) mutants in Arabidopsis thaliana that appear defective in plastid-to-nucleus signaling because the expression of genes that encode proteins active in photosynthesis is uncoupled from chloroplast function in these mutants. Here we describe the isolation and characterization of gun201 and the positional cloning of a gun201 nonsense allele. In addition to the gun phenotype, gun201 also exhibits a far-red block of greening phenotype. The far-red block of greening refers to the inability of seedlings irradiated with dim far-red light to green when subsequently irradiated with white light. In contrast to wild type, gun201 does not exhibit a far-red block of greening. We mapped gun201 to a 70 kb interval on chromosome 1. We sequenced ten genes in this interval and found that one of these genes contains a premature stop codon in gun201. We conclude that this gene is likely GUN201. GUN201 encodes a 200 kDa protein of unknown function that contains three tetratricopeptide repeat (TPR) domains. Our current understanding and future plans for GUN201 will be presented.

THE EFFECT OF MUSICAL STYLE ON THE THRESHOLDS FOR PERCEIVING TEMPO MODULATION

Lauren Steffy

Mentor(s): Frederick Tims (Music Therapy)

This study used three musical excerpts to measure the effect of musical style on participants' ability to detect tempo modulations. 12 female students of Michigan State University participated in the study voluntarily. The piano music for a Bach chorale, a jazz piece and a pop song were entered into Finale® 2005 software on an HP pavilion notebook computer and played back with Bose® MediaMate® computer speakers. The music was programmed so that the researcher controlled the tempo. Participants told the researcher when they perceived a tempo change. Results indicated that there was a significant difference in the thresholds for detecting tempo change between the Bach chorale and the jazz piece.

DETECTION OF FISSION FRAGMENTS OF URANIUM

Benjamin Strong

Mentor(s): Charles Folden (Chemistry), Dave Morrissey (Chemistry)

Recent experiments at the National Superconducting Cyclotron Laboratory have studied the fission of uranium to produce new, exotic nuclei. In order to identify all of the nuclear reaction products, careful calibration of the detectors was required. We accomplished this by using a gamma-ray detector to independently distinguish specific nuclei, and extrapolating to explicitly identify all the nuclei in the experiment. With this data we have begun to measure the yields of all the reaction products, which will lead to a greater understanding of the fission reaction. This poster will present the identification techniques used, and the latest results on the yields of fission fragments.

WEB-BASED SURVEYS

Rebekah Struck

Mentor(s): Ed Mahoney (CARRS)

This research will provide a tool that will make it easier for recreation and tourism enterprises of various kinds to conduct scientific Web-based surveys that will collect valid and reliable data across a variety of marketing research topics. It will also promote discussions among industry leaders to establish research and information priorities and lead to new forms of research partnerships.

EFFECTS OF STREPTOMYCIN IN THE MICROBIAL COMMUNITY

Fernando Suarez de Urbina

Mentor(s): Tom Schmidt (Microbiology & Molecular Genetics)

During the last couple of decades, antibiotics have been used over agricultural fields to control bacteria that cause disease in plants. Streptomycin is one of the major antibiotics that are used to spray the fields of infected crops. Normally, is has been used against fire blight, a major disease that affects apples and pear trees. The antibiotics disassociate the ribosomes of the bacteria and prevent it from synthesizing protein. The last decade has seen the appearance of streptomycin resistant strains of fire blight. Extensive research has been done on these new strains and new regulations of how to use the antibiotic have been implemented. However, all the studies have focused only on fire blight resistant strains without taking into consideration the effects of streptomycin on the microbial community. The purpose of this research is to investigate whether or not the non-pathogenic microbial community of fields that have been sprayed with streptomycin develops any resistant to it. This experiment has proven the development of resistant strains of microorganism to streptomycin. Fields that were sprayed with streptomycin had an increase in the appearance of streptomycin resistant colonies. The study was conducted by collecting 6 soil samples from fields that had been sprayed with and without streptomycin. The samples were diluted and placed in plates with different concentrations of streptomycin to evaluate its microbial growth. These results suggest that streptomycin use in plant agriculture is increasing the amount of antibiotic resistant microorganisms in the environment.

THE EFFECTS OF RESIDENTIAL DEVELOPMENT ON LAKE FOOD WEB SYSTEMS

Anjela Sullenger

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

Residential development of lake shorelines substantially reduces the complexity of benthic habitat in the littoral zones of lakes. This development has an unknown effect on food web linkages between benthic and pelagic zones. The large changes in the benthic zone could negatively affect fish production by reducing the amount of benthic prey available to them. Using stable isotope analysis of carbon in samples from snails (which feed primarily on benthic primary producers) and mussels (which feed primarily on pelagic primary producers), we will compare the carbon signals from the benthic and pelagic zones to determine if stable isotope analysis of fish and invertebrate samples can be used to determine if the fish obtain more nutrients from the benthic or pelagic zones. First we will determine if mussels are more depleted in the heavy carbon isotope, as has been shown in other studies. Second we will determine if invasive zebra mussels and native mussels have the same carbon isotopic signal so lakes with only native mussels and zebra mussels can be reliably compared. We found that for all lakes tested, snail and mussel samples have distinct carbon isotope signals. In Bruin Lake, which contains both types of mussels, we found that both types

have similar isotopic signals. We are completing sample preparation and will present findings from more lakes in April. This research will evaluate if residential development of lake shorelines is reducing food availability to fish in these lakes.

CONSERVATION OF TRYPTOPHAN REPRESSOR:DNA OPERATOR COMPLEXES

Ryan Sullivan, Jason Brunton
Mentor(s): Dennis Arvidson (Microbiology)

Repressor proteins are common in prokaryotic cells as a means to regulate gene transcription. In Escherichia coli, Tryptophan repressor (TrpR) is a small, homodimeric protein that regulates tryptophan biosynthesis. TrpR binds its co-repressor, L-tryptophan, forming a holorepressor complex that binds operator DNA tightly and prevents transcription of the trpEDCBA, aroH, aroL, mtr, and trpR operons. Thus, TrpR serves as a negative feedback mechanism to prevent tryptophan overproduction. TrpR binds to its operator using a highly conserved helix-turn-helix motif. However, despite many studies of TrpR:DNA complexes, how TrpR specifically identifies its operator remains unclear. Previous X-ray analyses suggest that water-mediated contacts predominate, while NMR analyses suggest that water-mediated contacts are unnecessary. We will crystallize and analyze multiple TrpR:DNA complexes which should provide further insight into the bonding pattern because they are designed to perturb the water-mediated contacts and may determine whether water-mediated contacts are present. If they are present, we will determine what effects changes in the DNA sequence have on the stability and structure of the complex, and if no water-mediated contacts are present, we will demonstrate which interactions confer specificity. In a second project, we plan to investigate interesting differences in the amino acid sequence of TrpR among various prokaryotic species such as Vibrio cholerae and Vibrio parahemolyticus. These changes may correspond to, and be compensated by, either complementary changes in the DNA sequence of the operators or changes in binding affinity.

MEASURING IDENTIFICATION OF NATIVE-LIKE SPANISH PRONUNCIATION

Megan E. Sutton
Mentor(s): Adolfo Ausn (Spanish)

It is common in Second Language Acquisition research to study the learners' ability to produce a native-like pronunciation of the target language. Less-commonly studied is students' ability to differentiate between native-like and non-native-like production upon hearing it. The purpose of this study is to examine whether SPN 330, a pronunciation and phonetics course, changes students' proficiency in identifying Spanish sentences as native-like or accented. To study this, at the beginning of the semester, the students in two sections of SPN 330 were asked to complete a pre-test on ANGEL. The test consisted of the same speaker pronouncing 34 different words that cover a wide variety of Spanish phonemes. Each word on the quiz was repeated with native-like, nearly native-like, and English-like pronunciation. Students were asked to listen to the recordings and rate them one by one on a five-point scale from native-like to non-native-like. At the end of the semester, the students will be asked to complete a post-test, and the responses will then be analyzed for similarity to both the native speakers and to the pretest. Preliminary analysis of the pre-test results shows a higher level of accuracy than hypothesized, but more data and deep analysis will be necessary. Depending on what we learn from the study, the professor will consider changing the goals for the class and his instructional techniques, so the study could be of direct benefit to later MSU students taking SPN 330.

CHILDREN'S USE OF PROSODY TO DETERMINE SYNTACTIC STRUCTURE

Megan M. Sutton, Thao Dinh, Andrew Valentine
Mentor(s): Alan Munn (Linguistics and Languages), Cristina Schmitt (Linguistics and Languages)

Adults use prosodic features such as chunking to choose the salient meaning of ambiguous phrases, but previous research has claimed that children do not use prosodic information well, and may not be able to disambiguate certain syntactic structures. This study aims to determine whether or not children correctly use prosodic information to choose the appropriate meaning from an ambiguous syntactic structure, and when in development this function might be acquired. We use an act-out task in which children choose a number of items from a group in response to an instruction. For example, in an array of different sized balls, some of which are black or white, children will hear the instruction "give me the big and black balls" will be given with two different prosodic tones: "give me the big and black balls" and "give me the big and black balls." If the children are able to use prosodic information correctly, they should be able to pick out two different sets of balls from the same instruction, depending on the prosodic features. Based on the children's decisions we will be able to determine whether or not they are actually

utilizing this prosodic information in their interpretation of the phrase. If we find that children are able to use these prosodic features we may be able to determine the age at which children acquire this function.

PEROXISOMAL FBOX PROTEINS

Jeffrey Swan

Mentor(s): Jianping Hu (Plant Biology)

The importance of F-box proteins and their roles in plants has been underscored by the recent discovery of their involvement in various hormone pathways. F-box proteins function to deliver specific substrates to the SCF complex which subsequently marks these substrates for degradation. Queries into the Arabidopsis thaliana genome have identified nearly 700 F-box proteins indicating that plants have a highly developed system of protein degradation that could play a major role in the regulation of cellular processes. The Hu lab has shown that three proteins with F-box motifs are sub-cellularly localized to the peroxisome, yet the peroxisome has never been shown to have a role in a ubiquitin degradation pathway. Using yeast two hybrid assays to examine possible interactions with another member of the SCF complex in arabidopsis, the role of these protein will be elucidated.

RUNNING ECONOMY IN MEN AND WOMEN VARSITY BASKETBALL ATHLETES

Ashley Swartz

Mentor(s): James Pivarnik (Departments of Kinesiology and Epidemiology)

Running economy can be defined as the amount of energy needed to perform the running activity. Individuals with good economy (low energy expenditure) may be more successful in their event or sport, all other things being equal. A variety of factors may be related to a person's running economy, including gender, height, weight, and body fatness. Most previous studies on running economy have focused on individual sports such as distance running, rather than team sports. However, basketball is a unique team sport well-suited for a running economy study, since athletes of various sizes are required to perform the same running over the course of a game. Our purpose is to evaluate and compare the running economy of MSU men's and women's varsity basketball athletes.

GETTING INTERRUPTED: WHY SOME TYPES OF INTERRUPTIONS MAY BE MORE DISRUPTIVE THAN OTHERS

Katie Swiderski

Mentor(s): Erik Altmann (Psychology), David Z Hambrick (Psychology)

This study asked why some types of interruptions are more disruptive than others based on a working memory model. We used errors to measure disruption caused by three different types of interruptions. Participants were also asked to record their confidence in order to see whether or not they knew when they made an error. There was no main effect for type. However, there was a clear effect of occurrence suggesting a practice effect; this result may be due to the act of rehearsal during the interrupting tasks. We found mostly negative correlations between errors and confidence ratings when they were reliable, but many cases had no correlation at all. Analyses also showed that the act of recording confidence had no significant effect on the number of errors made.

A STUDY OF TRANSITIONS BETWEEN DIFFERENT GAITS IN DRESSAGE HORSES

Erin Tans

Mentor(s): Hilary Clayton (LACS)

Transition development between gaits is essential to the correct training of dressage horses. At every level of dressage competition, judges examine the preciseness and clarity of transitions in between and during the walk, trot, canter and halt. Intermediate steps occur when a horse does not move directly from one gait to the next. We hypothesize that intermediate steps taken during transitions will differ between levels of training. Fifty horses were videotaped during a United States Dressage Federation competition, each performing approximately ten transitions from trot to halt. Timings of footfall patterns were measured frame-by-frame using the Dartfish TeamPro software. Duty factor was calculated as the percentage of the stride that a hoof was on the ground. Ipsilaterality was defined as the percentage of the stride during which two ipsilateral hooves were moving together in time. The combination of these two variables in a plot determined the gait of each hoof. If placement of a hoof in the plot was not within the range for a specific gait, an intermediate step had occurred.

A comparison of the gait from trot to halt at lower and higher levels of dressage competition showed that the transitions at higher levels had intermediate steps with increased duty factors and constant ipsilaterality (slow trot). The lower level transitions showed one or more walking cycles. Ongoing analysis will explore the intermediate steps between canter and walk, and canter and trot at low and high levels of dressage competition.

PREDICTING PERSISTENCE OF ADHD: A MOLECULAR GENETIC STUDY

Lauren Taubitz

Mentor(s): Joel Nigg (Psychology)

Attention-Deficit/Hyperactivity Disorder (ADHD) is generally accepted to be a highly heritable disorder with a heritability estimate of 0.76 (Faraone, Perlis, Doyle, Smoller, Goralnick, Holmgren & Sklar, 2005). Several dopaminergic and noradrenergic genes have been implicated in the disorder including DRD4, DAT, 5-HTT, and ADRA2A (Faraone, Perlis, Doyle, Smoller, Goralnick, Holmgren, et al, 2005). In addition, familiality has been demonstrated to be a predictor of persistence of the disorder (Biederman, Faraone, Milberger, Curtis, Chen, Marrs, et al., 1996), and genetic influences have been shown to explain 45% to 90% of the variance in hyperactivity-impulsivity and inattention across age (Larsson, Lichtenstein, & Larsson, 2006). The present study seeks to investigate the role of the DRD4, DAT, 5-HTT, and ADRA2A genes in persistence of the ADHD into adulthood. Clarification of genetic effects on persistence could inform clinical evaluation of risk for long-term persistence of the disorder so that preventive treatment can be administered at an early age.

GRAND RAPIDS: A STUDY OF GEOGRAPHIC RACIAL EQUALITY

Allison Taunt

Mentor(s): Joe Darden (Geography)

This study differs from many other studies of racial inequality. It examines geographic racial equality. The purpose of this study is to determine the extent to which there are municipalities in Metropolitan Grand Rapids, Michigan where Asian-Americans have achieved geographic racial equality. I hypothesize that there are several places where Asian-Americans have achieved geographic racial equality with whites. The data used was from the 2000 United Sates Census of Population and Housing. Using this data, places were identified where Asians had achieved equal or greater status than whites in the areas of income, occupation, and education. The index of dissimilarity was used to measure the extent to which Asians and whites were integrated in the municipalities. Only one place in the Grand Rapids metropolitan area, Forest Hills, was found to have geographic racial equality. The hypothesis was therefore rejected because there was only one place in the Grand Rapids metropolitan area that has geographic racial equality as opposed to several. This study, however, reveals nothing about social equality between Asians and whites or racial discrimination.

GREEN ROOF COST BENEFIT ANALYSIS

Caitlin Taylor, John Darling, Emma Distel, Brian Ryerkerk

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

Green roofs, or a layer of vegetation that is installed in a growing medium on top of a building, are an excellent alternative to conventional roof systems, which generally consist of a waterproofing membrane and a gravel ballast to hold the membrane down. In addition to insulating a conventional roof's heat-sensitive waterproofing membrane from harmful radiation and thus increasing the roof's longevity, green roofs provide environmental benefits such as rainwater retention, subsequent polluted runoff reduction, as well as carbon sequestration. Other benefits include energy savings from added insulation, reduction of the heat island effect, and pleasing aesthetics. The research objective was to theoretically quantify the benefits versus the cost of installing a green roof system on the new recycling facility on campus, which could provide up to 70,000 square feet of green space on its roof. This research was accomplished through a literature review and case study analysis.

TIME SCALES OF AQUEOUS ALTERATION ON THE C2 CARBONACEOUS CHONDRITE PARENT BODY

Gabrielle Tepp

Mentor(s): Michael Velbel (Geological Sciences)

The type of meteorites known as C2 carbonaceous chondrites are primitive meteorites which preserve evidence of the conditions of the early solar nebula from which the planets, asteroids, comets, and other solar system bodies condensed. These chondrites contain evidence of interactions between minerals and water which gives us information about water in the early

solar system. The meteorite QUE93005 was found in Antarctica and is one of the most extensively altered CM2 chondrites known. This meteorite contains a number of grains of partially altered olivine, an anhydrous magnesium-iron silicate mineral. In scanning electron microscope images, the cores of these grains, which are the remaining un-altered olivine, are surrounded by the hydrous magnesium-iron silicate mineral serpentine which is the product of olivine hydration reactions. High-Fe olivines appear to be slightly more extensively altered than low-Fe-olivines. Replacement also seems to be anisotropic, more extensive in some crystallographic directions than in others. The replacement textures of these grains suggest that the rate-limiting process of the reaction was the diffusion of water and/or solutes through the serpentine reaction rims. By measuring and using the thickness of these alteration rims as a proxy for the lengths of the diffusion paths, we apply a shrinking core model to approximate the duration of the olivine hydration episode in QUE93005. This estimated duration of the hydration period is compared with the timescales of other processes happening during the early history of the CM chondrites' asteroidal parent body.

EFFECTS OF RCAE ON CELL MORPHOLOGY IN FREMYELLA DIPLOSIPHON

Michaela TerAvest
Mentor(s): Beronda Montgomery-Kaguri (Plant Research Laboratory Natural Science)

RcaE is an important light-sensing protein found in the cyanobacteria Fremyella diplosiphon. It is involved in regulating the relative concentrations of the phycobiliproteins phycocyanin and phycoerythrin in vivo in response to red and green light, respectively. These phycobiliproteins harvest light of different wavelengths with different efficiencies. RcaE regulates the relative amounts of the phycobiliproteins to maximize light absorption for photosynthesis. In prior studies that characterized the physiological roles of RcaE in F. diplosiphon, another interesting effect was noticed; mutating RcaE caused changes in cell morphology. Wild-type F. diplosiphon cells are rod shaped, while RcaE-deficient cells are circular. This cell-shape phenotype could be complemented by expressing a wild-type copy of rcaE in the RcaE-deficient strain. These results indicate that RcaE may also have some role in regulating cell shape and perhaps cell wall structure. To examine whether the cell wall of RcaE-deficient cells is impacted and thereby resulting in the observed morphological changes, the lysozyme sensitivity of varying strains of F. diplosiphon were compared. Lysozyme sensitivity was tested by assaying for the release of phycobiliproteins from treated cells. Relative concentrations of extracted phycobiliproteins were quantified for wild-type, RcaE-deficient and complemented strains. To assess the impact of RcaE activity on cell shape and cell wall structure, quantified values of released phycobiliproteins were correlated with both cell shape and the presence or absence of functional RcaE in tested strains.

RELATING THE BALANCED SCORECARD TO RESOURCE AND INDUSTRIAL THEORIES

John Thelen
Mentor(s): Sue Haka (Accounting)

This paper examines the effects of resource and institutional factors on the construction of balanced scorecards of for-profit, not-for-profit and governmental organizations. Resource and institutional theories have been shown to explain firm strategies. The balanced scorecard is designed to push the firm's strategy throughout the organization. Thus, variation in observed across various organizational types with should reflect the differences in strategies. We analyze the Hall of Fame set of balanced scorecards in each of the four perspectives (financial, customer, processes and learning and growth) and find evidence that shows the variation in the number of objectives in each perspective differs among for profit, not for profit and governmental in a predictable pattern related to resource and institutional factors faced by these organization types. We find for-profit organizations create more objectives in the financial perspective, while governmental and not for profit organizations create more objectives in both learning and growth and customer perspectives. The results suggest that organizations constructing a balanced scorecard will likely focus on measures and goals consistent with the types of resources and institutional constraints faced by organizations.

MOOD AND PERSON PERCEPTION: THE IMPORTANCE OF OBSERVER MOOD

Danielle Thomas
Mentor(s): Brent Donnellan (Psychology)

Does mood affect the first impressions that are formed about strangers? Accurate first impressions are very important, especially when making judgments of others. However, it is possible that mood affects "snap" judgments of others such that others are evaluated more or less favorably depending on an individual's own internal state. The current study will investigate

this possibility by manipulating mood states and evaluating whether or not this influences ratings of positive, negative, and neutral faces in terms of overall evaluations and specific impressions. People in a happy mood are predicted to make more positive evaluations of others in both face ratings and impression judgments. In contrast, people in a sad mood are predicted to make more negative evaluations of others in both face ratings and impression judgments.

STRUCTURAL MODELS FOR THE ACTIVE SITE OF ACETYL COENZYME A SYNTHASE

Jason Thomas

Mentor(s): Eric Hegg (Biochemistry and Molecular Biology), Vaidyanathan Mathrubootham (Biochemistry and Molecular Biology)

The unusual bifunctional enzyme CODH/ACS catalyzes the biosynthesis of acetyl-CoA. In the first step, CO_2 is reduced to CO by CODH, and ACS then combines the CO with -CH_3 and coenzyme A to generate acetyl-CoA. The active site of the ACS enzyme is comprised of a unique Ni-Ni bimetallic site. One of the Ni ions is in a square-planar environment and is coordinated to two thiolates and two deprotonated amides in a Cys-Gly-Cys motif. The second Ni ion, however, is coordinated to three Cys thiolates and is considerably more comformationally flexible. To address the many mechanistic questions related to ACS, we began synthesizing small metal complexes that serve as well-defined mimics of the active site. In order to model the unusual Ni(C-G-C) site of ACS and probe the reactivity available to it, we designed an asymmetric ligand and made its corresponding Ni-complex. The Ni-complex crystallizes as the trinuclear complex. The mononuclear complex is synthesized by breaking down the trinuclear complex with excess base and Ni-salt. The model complexes were characterized by various spectral techniques.

SYNTHESIS, STRUCTURE, AND MAGNETIC STUDIES OF TRIMETALLIC μ-TERT-BUTYLIMIDE COMPOUNDS

Justin Thomas

Mentor(s): Rob LaDuca (Lyman Briggs College)

In the past century, the study of organic polymers has soared into a multi-billion dollar industry while not much attention has been given to the development of organometallic polymers; however, recent advancements show that this prospective type of chemistry could hold much potential. By transaminating $W(NH^tBu)_2(N^tBu)_2$ with a $MN(SiMe_3)_2$ species (M = Co, Fe, Zn, Mn) soluble "MWM" and "WMW" type trimetallic μ-tert-butylimide compounds were synthesized. Single crystal x-ray diffraction revealed π-electron delocalization at the bridging imide ligands in all cases and unusual antiferromagnetic coupling around the MWM trimetallic species through the tungsten bridge. Current research is underway to create an oxidized WFeW species with tetrahedral coordination geometry around the central Fe^{3+} ion, rarely seen in inorganic chemistry. Compounds with linked and alternating W and M centers have the potential to form metal-organic polymers with the possibility of conducting electricity along the metal axis. These "molecular wires" could prove to show useful magnetic and electrical applications.

DENSITY DEPENDENT GERMINATION RATES OF THREE SUMMER ANNUAL WEEDS

Anna Timmerman

Mentor(s): Christy Sprague (Crop and Soils Sciences)

Summer annual weeds compete with crops for water, nutrients, and sunlight and can host detrimental insects and pathogens. Understanding biotic and abiotic influences on the germination of these weeds offers insight into how to manage them. Previous field research examining giant ragweed (Ambrosia trifida) and common sunflower (Helianthus annuus) has suggested that germination may be density dependent, with greater the densities of seeds resulting in lower relative germination rates. A greenhouse study was designed to determine if there is a correlation between density and germination. Ten planting densities, ranging from 0.5 to 7.0 seeds/inch2, were examined for three summer annual species; giant ragweed, common sunflower, and velvetleaf (Abutilon theophrasti). Once per week emerged seedlings were counted and clipped, for a total of five weeks. The germination rates of giant ragweed and common sunflower were very low for both trials, ranging from 0 to 7% for giant ragweed, and 0 to 2% for common sunflower. As a result of low germination, no differences were observed among treatments. In contrast, velvetleaf germination ranged from 25 to 100%. For the first trial, the highest density of 7.0 seeds/inch2 resulted in the lowest germination percentage of 59%. Overall, in the second trial germination rates were lower, and there were no observed differences among densities. Future studies should examine the possible causes (e.g. seed dormancy, allelopathy, etc.) of germination responses to seed density.

IMPACTS OF BOTTLED WATER USE BY STUDENTS ON THE MICHIGAN STATE UNIVERSITY CAMPUS AND PROMOTION OF AVAILABLE ALTERNATIVES

David Tindle, Karl DeVries, Lindsay Hatter, Johanna Kinsler
Mentor(s): Steve Safferman (Biosystems Engineering)

Unnecessary use of bottled water is harmful to the environment and to a person's pocket book. Bottled water costs more than gasoline per gallon, has fewer health regulations than tap water, and is usually packaged in plastics which can leech carcinogens. The 8.3 billion gallons of bottled water sold in the United States in 2006 required 462 million gallons of oil for transportation from the factory to stores. Other environmental impacts include the energy and carbon dioxide release when mining materials for bottles, producing them, recycling them, or throwing them away. (Responsible Purchasing Network, Oct. 2007) The most important goal of this project is to determine how to best reduce bottled water use on the Michigan State University campus. This research will help to develop an advertising campaign supplemented with facts and resources found from students on campus. These facts will be related toward why bottled water is chosen over the tap, their awareness of bottled water alternatives, and energy and materials saved when bottled water is not used. This information will be found via surveys administered by direct questioning of students in two dormitory halls on campus and literature sources. It is hypothesized that by using the survey and developing an advertising campaign campus wide that consumption and negative environmental impacts on campus will be reduced. By making students more aware of bottled water alternatives already available and encouraging hall directors to invest more heavily in lowering bottled water use in dormitories this research will have the greatest effect.

HAIR: A COMPARATIVE ANALYSIS ON STRUCTURE AND FUNCTION

Suzanne Towner
Mentor(s): Carl Boehlert (Department of Engineering and Materials Science)

A comparative analysis on hair was done in order to determine the role that structure plays on the functions that hair performs. A Scanning Electron Microscope was used to view different samples of hair which included human, dog and reindeer. Each sample was examined at varying magnifications while using secondary electron imaging. Observations on structure were made by analyzing and comparing pictures taken of each hair's construction and organization. The samples were all compared against each other in order to establish whether these hairs that provided certain functions, such as insulation, were similar in structure to other hairs that provide the same service on other organisms.

CAUSES OF INJURY TO BIRDS BROUGHT TO A SOUTHEASTERN MICHIGAN REHABILITATION CENTER

Taaja Tucker
Mentor(s): Shawn Riley (Fisheries and Wildlife)

Wildlife rehabilitation clinics and nature centers are an increasingly important link between citizens and wildlife that can be useful for public education. The Howell Conference and Nature Center wildlife rehabilitation clinic in Howell, Michigan receives 2000+ mammal, bird, and reptile intakes every year. Information such as species, age, location found, what happened to the animal (if known), and the care of the animal at the center are recorded for each intake. Data sheets were compiled for the year 2003 and analyzed to find the leading causes of injury to passerines, raptors, water birds, and game birds. In 2003, 858 birds were brought to the clinic. Overall, the leading reason birds were brought to the nature center was because they were young without parents (44%). Other causes included vehicle collisions (7%), cat attacks (6%), window or building collisions (5%), and wildlife attacks (3%). Thirty percent of all intake causes were unknown while forty-six percent of all cases resulted in fatality. Leading known causes of injury to passerines (n= 579) were cat attacks (29%), window collisions (20%), and vehicle collisions (17%). Vehicle collisions were the leading known cause of injury to all other groups (52% raptors, n = 69; 40% water birds, n=179; 49% game birds, n=31). A discussion of these causes, the importance of rehabilitation centers, and implications of this data for public education are discussed.

TRICHOTHECENE MYCOTOXINS AND THE RIBOTOXIC STRESS RESPONSE

Grace Tung

Mentor(s): James Pestka (Food Science and Human Nutrition)

There are many toxins present in the environment and some can often be found as contaminants in food. Some of these toxins are translational inhibitors, which include: ricin, shiga toxin, anisomycin and trichothecenes. Trichothecene mycotoxins are produced by the Fusarium species, which contaminate wheat, barley, and corn. Trichothecenes can produce multi-organ damage because they are cytotoxic to cells at high levels. They have a large impact on health because of their immunosuppressive effects, often causing irritation of mucosal membranes and gastroenteritis. The most common trichothecene found in cereal based foods is deoxynivalenol (DON) also called vomitoxin, aptly named because it causes excessive salivation and vomiting when ingested. All of these toxins are associated with the "ribotoxic stress response", which ultimately leads to either cell death or survival through the inhibition of translation and the activation of the mitogen-activated protein kinase (MAPK) pathway. This pathway is important for intracellular signaling that initiates proliferation, differentiation and apoptosis in cells. It is believed that ribosomes mediate MAPK activation when 28rRNA is damaged, but the interaction between the MAPKs on ribosomes is not clearly understood. To study this interaction, ribosomes from macrophages were separated using sucrose gradients and the interaction between the MAPK in non-polysome (40S, 60S, and monosome) and polysome fractions was determined using immunoblotting. We found MAPKs interaction was increased on the ribosome by DON stimulus. This suggests that when DON binds to the ribosome, it produces a conformational change that induces multiple kinase interactions which activate the MAPK pathway.

PIANO STUDY AS RESEARCH OF SELF

Mary Turcotte

Mentor(s): Panayis Lyras (Piano)

Playing the piano well requires the constant and delicate balancing of emotions, intellect and technique. In an ideal pianist, all three should be equal. However, it is difficult for pianists to attain this balance. Young pianists begin lessons with a certain physical aptitude, which is improved through careful study with a good teacher and hours upon hours of practice alone. In addition, pianists must learn theory, harmony, and the history of music, thus sharpening their intellect, and also draw upon their accumulated life experiences in order to attempt to identify with the emotional and intellectual message of the composer. Therefore, in learning to play the piano, the pianist also learns a lot about oneself. Wolfgang Amadeus Mozart's Rondo in A minor, K. 511, is an excellent piece for pianists to explore their intellect and emotions. The pianist is required to portray varied emotions with very few notes, while maintaining a beautiful sound and seamless legato. Written in Vienna in March of 1787, the Rondo is considered one of the most beautiful pieces Mozart wrote. Unlike many of Mozart's works, it contains many more clues in the score as to how he intended for it to be played, in the form of slurs, dynamics, and other markings. In my lecture and performance of this work, I will elucidate my intellectual and emotional understanding of it and my interpretation of what Mozart wrote in the score.

IDENTIFICATION AND ANALYSIS OF GAMMA AND BETA ACTIN PROTEIN INTERACTIONS WITHIN THE INNER EAR THROUGH THE USE OF A YEAST TWO HYBRID

Tychele Turner

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

Six mutations in γ-actin have been found in an autosomal dominant type of progressive hearing loss in humans. γ-Actin is an important protein in the structure of hair cells within the inner ear. Also present in the ear is another cytoskeletal isoform of actin, β-actin, which differs from γ-actin by only four amino acids. In order to elucidate the protein interactions of both γ- and β-actin within the inner ear a yeast two-hybrid screen was performed three times for each actin. Individually, I screened 71,642 clones in the γ-screen and identified 27 positive interactions. Of those interactions, 56% were γ-actin, 26% were β-actin, and 18% were other interactions including a known interactor, cofilin-1. In the β-screen, I screened 574,000 clones and identified 114 positive interactions. Of those interactions, 70% were γ-actin, 21% were β-actin, 4% were ubiquitin conjugating enzyme E2i, and 5% were others including a known interactor, CAP2. Each of these positive interactions were identified by sequence

analysis followed by comparison to NCBI's BLAST. Subsequent verification of the positive interactions is in process, in particular with a potential novel interaction between both γ- and β-actin and ubiquitin conjugating enzyme E2i (Ube2i). The current approach to this verification is through the use of truncation mutations to identify the binding site of Ube2i for γ- and β-actin. The goal is to verify and follow-up on the interaction with Ube2i to see if it is different in the γ-actin mutations associated with progressive hearing loss.

COMPENSATORY EVOLUTION

Beverly Twiss

Mentor(s): Barry Williams (Zoology)

A simple model of compensatory evolution involves a pair of mutations at different loci which are individually deleterious but neutral when combined. The purpose of this study is to determine the effect of two compensatory point mutations within the anticodon stem of tRNALeuGAG on the fitness of S. cerevisiae. The URA3 ORF from plasmid pRS406 was PCR amplified using primers containing 5' tRNA 28 & 44 position mutations. The PCR product was then transformed into a S. cerevisiae strain containing GFP, and URA3 was eliminated via recombination of 5' and 3' tRNA. After each mutant strain was created, it was back crossed to the parental strains to ensure fidelity. Mutant and wildtype offspring of these crosses were used in fitness analysis. Absolute growth experiments were conducted to test the fitness of the mutant strains relative to control strains in various environments. Relative growth was measured via flow cytometry by direct competition of the strains. In the future, I plan to repeat this process in other tRNA genes in order to better characterize the role of compensatory mutations in evolution at the molecular level.

ASSESSING CHILDREN'S PRODUCTIVE USE OF 'WILL' AND 'GONNA'

Andrew Valentine

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

In English, the future may be expressed either through 'will' or 'be going to', ('gonna') which have similar but non-identical meanings. As a result, an ongoing area of research is devoted to determining the differences in a child's acquisition of these two forms. Past research seems to indicate that 'gonna' is used earlier and more frequently than 'will'. Using the CHILDES database (a database of transcribed children's and adults' speech), children's productive use of 'will' or 'gonna' was coded for features such as event type, genericity, and person. There remain questions, however, as to whether the data were uniformly coded by multiple experimenters, and also whether children use 'gonna' with a wider variety of verbs than 'will'. Therefore, a type-token analysis was conducted on the data to determine if any more general trends could be uncovered. This will provide further evidence that children's productive use of 'gonna' precedes their productive use of 'will'.

INNOCENT BYSTANDERS

Kayla Vallosia, Jessica Lowry, Erik Mitchell, Melissa Vermette

Mentor(s): Suzanne Cross (Social Work)

In our presentation, we will identify who bystanders are in the world of bullying. We will also look at what they can do to stop or encourage bullying among their peers.

DISCOVERING A GARMENTS HISTORY

Valerie Vanderkolk

Mentor(s): Karen Kangas-Preston (Theatre), Jodi Ozimek (Theatre)

The Department of Theatre Costume Shop is in possession of an overdress and underskirt dating to the mid-1700's. Little is known about the garment's provenance and the exact date of the garment is unknown. The undergraduate research assistant will aid faculty in researching methods of preservation and preparing the garment for display (steaming, light cleaning, and minor repair), historical fabrics (both fiber content and trends in fabric pattern/design) and period silhouettes of the 1700's. Assistant will also examine the garment in detail to determine if any changes or alterations have been made to the garment.This project will attempt to determine provenance and date the garment to a specific era in history. The garment will be useful for study in department courses such as TH313/813 (Period Resources) and TH212 (Production Design Costumes and Makeup) as well as to undergraduate and graduate costume design students studying costume history. It will also be made available to the Apparel & Textile Design students studying Fashion History.

VIRTUAL HISTORY MUSEUM

Andrew VanEgmond

Mentor(s): Cindy Okolo (Counseling, Educational Psychology & Special Education)

The Vitual History Museum is an interactive, technology-based teaching tool which allows the creation of exhibits to engage integrated history classrooms in discovery and activities. The specific part of the project I am working on involves the analysis of the children's written responses to photos involved in the museum based on the style of their historical writing. This coding is done in order to draw conclusions about the relationship between those styles and other variables such as historical reasoning.

DEVELOPMENT OF CANINE SINE INSERTION POLYMORPHIC MARKERS FOR A GENOME SCAN FOR THE CRANIOMANDIBULAR OSTEOPATHY (CMO) DISEASE GENE

Megan VanSickle

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

The use of a popular sire in dog breeding has increased the occurrence of canine genetic diseases. Presently, our lab is conducting a scan of the canine genome for the gene that causes Craniomandibular Osteopathy (CMO). This disease is characterized by a non-cancerous proliferation of the jaw bone. A large amount of transposons called SINEs are polymorphic for insertions and are convenient, inexpensive markers to test the hypothesis of linkage to the CMO gene. Using scripted computer-based methods, I designed PCR primer sets for 48 presumed polymorphic SINEs. Approximately two-thirds had minor allele frequencies (MAF) greater than 0.2. A pooling method was used to indicate reasonable estimates of MAF. Markers having a higher MAF are more probable to be variable in any individual breed. These markers will be beneficial for discovering the CMO disease gene, as well as the identification of other canine disease genes. Overall, it will result in improved health of all dogs.

CHANGES IN MYOBLAST ACTIVITY DURING PIG DEVELOPMENT ARE NOT EXPLAINED BY INHERENT DIFFERENCES IN PHENOTYPE OR GLOBAL GENE EXPRESSION PATTERNS

Blaire Varnes

Mentor(s): Matthew Doumit (Animal Science), Catherine Ernst (Animal Science)

Our objectives were to quantify the proportions of proliferating and differentiating myoblasts during pig development, and to determine if isolated myoblasts display unique developmental phenotypes and gene expression patterns when cultured under common conditions. Myoblasts were isolated from longissimus muscle of pigs from 3 litters at 57-, 70-, 90-, and 105-d gestation, and 3 pigs at birth, 1-, 3-, 5-, and 7-wk postnatal. Fluorescent immunostaining for neural cell adhesion molecule (NCAM) was used to identify myoblasts, and proliferating cell nuclear antigen (PCNA) and myogenin were used as indices of cell proliferation and differentiation, respectively. The proportion of PCNA+/NCAM+ cells in freshly isolated cells was high (>70%) and similar in pigs between the ages of 57-d and 3-wk, but was lower (54%; $P < 0.05$) in isolates from 7-wk old pigs. The proportion of myogenin+ myoblasts was similar from 57-d to 105-d, but was markedly lower at birth than at either 105-d or 1-wk (8% vs 27% and 41%, respectively; $P < 0.05$). When comparing myogenic cell proliferation and differentiation under common environmental conditions, the number of cells in myogenic colonies and the proportion of myogenin+ cells within colonies did not differ among ages ($P > 0.61$). Mass cultures from these pigs were harvested for transcriptional profiling experiments. Microarray analysis of undifferentiated cells from pigs at 105-d gestation and birth revealed no differences in global gene expression. Collectively, these data suggest that the in vivo environment, rather than inherent cellular differences, govern the proliferation and differentiation of myogenic cells during development.

USING DRAMA FOR LITERACY TEACHING IN URBAN SCHOOLS

Christin Vasilenko

Mentor(s): Rhea Lathan (Writing, Rhetoric, and American Culture)

My hypothesis is that Drama can be effectively used in the English/Language Arts classroom to help literacy learning in Urban Schools, particularly to help At-Risk students. I have been volunteering at Pattengill Middle School's after school drama program, where I have been able to observe what activities work with these kids. I have researched a variety of theater games, as well as reading and writing techniques which incorporate drama with literacy teaching. To collect my data, I have been videotaping sessions with the students at Pattengill, as well as interviewing them to get their thoughts about drama, their personal literacy levels, and their best styles of learning. The teachers at Pattengill who run the program have been reading the

book Monster by Walter Dean Myers to the students and using drama to help make the text come to life. They have also incorporated writing into the project, by having students write journal entries. I have been observing the positive effect that drama has had on both their comprehension and writing through these teaching methods.

UNTITLED

Syhming Vong

Mentor(s): Nicole Sowinski (Art/Art History)

I'm going to be experimenting with different media and how they work with each other. Through this, I'm hoping to achieve a better understanding of some basic principles of art and design as well as the media. And I also hope the audience will be inspired to maybe to try and make or do something out of the norm while accomplishing the task that they need to.

COURTING DISASTER: STATE-BUILDING IN AFGHANISTAN

Adam Wagner

Mentor(s): Matt Zierler (International Relations)

The American intervention in Afghanistan is entering its seventh year. Afghanistan is spiraling into chaos as NATO argues over how to stabilize the country. Warlords run amok, opium flows freely, and Taliban activities are on the upswing. What went wrong? My research will show how developments since the American invasion have failed to stabilize Afghanistan. The focus will be on asymmetric warfare, warlordism, illicit opium trade, terrorism, and the Taliban insurgency. Further, I will posit political and economic solutions to these issues.

COVERAGE OF MENTAL ILLNESS IN AFRICAN-AMERICAN MAGAZINES

Shalane Walker

Mentor(s): Theresa Mastin (APRR)

On August 26, 2001 then U.S. Surgeon General David Satcher released a report titled, Mental Health: Culture, Race, and Ethnicity, which detailed the mental healthcare system's failure to adequately serve minority populations. As a result of that report, our study emerged from and is founded on three premises: 1) most Americans obtain mental illness information from the media, 2) historically, Black media have served an important role in the Black community, and 3) the media are particularly adept at both reaching and influencing their targeted audiences. Relying on media advocacy theory, which emphasizes the social dimensions of a given problem as compared with the individual dimensions, we content analyze selected Black magazines' (Black Enterprise, Ebony, Essence, and Jet) coverage of mental illness from 2000-2007 to determine whether the magazines' mental illness coverage increased in the years following the report. Primary variables examined include: mental illnesses featured; the overall tone (pessimistic or optimistic) of the magazines' mental illness coverage; overarching themes, e.g., culture, stigma, signs and symptoms, treatment options, support systems, family conflict, role of religion and faith of the magazines' coverage; articles' main character(s) and main narrator(s); claimsmakers, that is, those who are quoted and thus placed in a position to control the meaning of mental illness; whether mental illness is more often framed in an episodic (event oriented, specific, and concrete) or thematic (issue oriented, general and abstract) context; and whether the mental illness problems and solutions are more often framed as an individual or societal issues.

AN ANALYSIS OF HEALTH COMMUNICATION RESEARCH: IS HEARING LOSS ACCOUNTED FOR?

Jessica Warnshuis, Emily Brockschmidt

Mentor(s): Jill Elfenbein (Communicative Sciences and Disorders)

More than 28 million Americans have hearing losses, a disability that is often described as “invisible.” They need many of the same types of health information as others in society. Researchers in the field of Health Communication are among the individuals working to develop public health messages and campaigns. The purpose of this study was to discover whether researchers publishing in two prominent Health Communication journals focus on hearing loss as a primary topic, include individuals with hearing losses in their subject groups and consider hearing loss as a key factor when studying populations that are likely to include individuals who have hearing losses (e.g., nursing home patients). Data were gathered by reviewing articles published in Health Communication and the Journal of Health Communication from January 2006 to December 2007. This poster will outline evidence that individuals with hearing losses do appear to be invisible to some researchers.

A DECISION-MAKING ALGORITHM FOR MOSQUITO BLOOD MEAL IDENTIFICATION USING PCR AMPLIFICATION OF THE VERTEBRATE CYTOCHROME B GENE

Amy Wechsler

Mentor(s): Edward Walker (Microbiology)

Analysis of the blood found in wild caught mosquitoes using molecular procedures has recently become an important tool for identifying the vertebrate hosts utilized by mosquitoes in nature. The currently preferred method involves amplification of the mitochondrial cytochrome B gene, due to its conserved and variable nucleotide sequence. It allows for design of conservative primers yielding amplicons with variable regions, whose sequences can be matched to databases, thus the source of the original blood can be reliably determined. However, there exists no algorithm which allows decisions to be made concerning the vertebrate species assumed to be the source of blood after this procedure has been applied, especially when several primer pairs are utilized in series for the same sample. No single primer pair has been found to be optimal for all potential vertebrate groups. This research involves an investigation of mosquito blood hosts from a sample of 1,112 bloodfed mosquitoes collected during investigations of West Nile Virus transmission in suburban Chicago. Sequence data from amplicons from four different primer pairs yielding fragment sizes of 508, 772, 358, and 228 base pairs were examined for their percent match to sequences from GenBank. The goal is to develop an algorithm allowing researchers to make decisions for each bloodmeal as PCR amplifications and sequencing reactions are conducted: whether to accept the result of any particular returned sequence match as confirmatory, or to pursue additional amplifications and sequencing with the additional primer sets, when the prior ones produced inconclusive results.

THE PALATABILITY OF FISH OIL FOR HORSES

Kayla Weiss

Mentor(s): Brian Nielsen (Animal Science)

Omega-3 fatty acids are thought to have health and performance benefits for horses. This study tested the palatability of four feeds with different concentrations or forms of fish oil, a common source of omega-3 fatty acids. Ten horses were removed from pasture twice daily on each of four testing days, and placed in assigned stalls that contained two feed buckets hung side by side. Each bucket contained 1 kg of feed representing four combinations of diets containing varying concentrations and forms of fish oil to be evaluated (0% vs. 0.5%, 0% vs. 1% unprotected, 0.5% vs. 1% unprotected, and 1% unprotected vs. 1% protected). Bucket location (left vs. right) was reversed in the afternoon compared to the morning. Horses were given ten minutes to consume as much feed as they preferred. Afterwards, buckets were removed and weighed to calculate consumption and horses were returned to pasture until the next testing. There was no difference ($P = 0.65$) between diets containing 0% and 0.5% and between diets containing 1% fish oil or either form ($P = 0.40$). Horses consumed more of diets containing 0% and 0.5% fish oil as compared to diets containing fish oil at 1% ($P < 0.01$). This study determined horses preferred not to eat diets including 1% fish oil, regardless of the form, and suggests other means are needed of providing adequate concentrations of omega-3 fatty acids in order to include them in commercial equine diets.

FACEBOOK @ MSU: FACULTY USAGE AND ATTITUDES

Nicholas Wendling, Ashley Jurkovich, Alicia Boyers

Mentor(s): Kris Renn, (Educational Administration)

Abstract: For this study, we interviewed MSU faculty who use the online social networking site FaceBook.com, which is popular with students. We asked faculty about their general usage, the ways that they interact with students using FaceBook, and perceived benefits for teaching and learning.

MOLECULAR EVIDENCE FOR POSITIVE SELECTION OF THE ANTIFIV GENE APOBEC3C IN CAT SPECIES: A MODEL FOR UNDERSTANDING HOST VS PATHOGEN ARMS RACE OF HUMANS WITH HIV

Trisha Westerhof

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

Human apolipoprotein B mRNA editing enzyme catalytic polypeptide 3 (APOBEC3) proteins are known cytidine deaminases that block the replication of retroviruses such as the human immunodefiency virus (HIV-1). However, a small protein called vif, encoded in HIV, is able to target APOBEC3s for degradation by the proteasome. APOBEC3 genes are also present in domestic cats, and the encoded proteins show cytidine deaminase activity that inhibits HIV-1 replication. It is hypothesized that a

continuing war of lentiviruses with the feline host has caused the APOBEC3C gene to undergo strong positive selection for sequence variations that would interfere with the operation of the vif protein. This hypothesis was tested by examining the ratio of amino-acid changing to silent nucleotide substitutions (the Ka/Ks ratio test) during the evolution of the gene in domestic cat and several wild cat species. Primers were designed to flank domestic cat exons and used to amplify and sequence the homologous exons in fishing cat, tiger, and snow leopard. Although not all exons amplified, comparable regions show a much larger number of non-synonymous than synonymous substitutions, supporting the hypothesis. The positional information of these substitutions may help in the development in pharmaceutical molecules that would interfere with the binding vif to APOBECs, which could lead to improved therapy for FIV/HIV infections.

STUDY OF ELECTROSPUN NANOFIBERS FOR USE IN A CONDUCTOMETRIC BIOSENSOR

Michael Wiederoder

Mentor(s): Evangelyn Alocilja (Biosystems Engineering)

Electrospinning is a technique that produces nanoscale fibers by extracting a solution from a syringe under high voltage. The result is an extremely thin fiber that can be woven into a mat that can be used in a sensor. Also as a result of the electric field created these nanofibers can be aligned to produce ideal characteristics for sensing devices. For my experiment these nanofibers made of nitrocellulose are to be used in a biosensor. Biosensors are electronic signal based sensors used to detect various biological elements. This type of biosensor can detect microorganisms for use in food safety, bioterrorism prevention, and other useful applications. The CDC recently estimated that foodborne pathogens result in 76 million illnesses, 325,000 hospitalizations, and 5,000 deaths in the United States each year. My experiments prove that these nanofibers have potential to be used in a conductometric biosensor

THE INFLUENCE OF MYSPACE AND FACEBOOK EVENTS ON INTERPERSONAL RELATIONSHIPS

Benjamin Wiedmaier

Mentor(s): Kelly Morrison (Communication)

This research presents an exploratory study that examined the influence of social networking sites on interpersonal relationships. As part of a larger online survey, participants were asked to recall and describe a relationship problem or conflict that occurred because of MySpace or Facebook. Their responses were coded utilizing Planalp and Honeycutt's (1985) uncertainty increasing events category scheme. Implications for relational research are discussed.

CHARACTERIZATION OF PUTATIVE MIGRATORY AND SEX PHEROMONES IN PACIFIC LAMPREY

Andrew Wildbill

Mentor(s): Weiming Li (Fisheries and Wildlife), Sang-Seon Yun (Fisheries and Wildlife)

This study was performed on Pacific lamprey (Entosphenus tridentatus) from the Pacific coast, to characterize putative migratory and sex pheromones. Mass spectrometry analysis of larval washing extract revealed the presence of petromyzonol sulfate, 3keto petromyzonol sulfate, allocholic acid, 3keto allocholic acid, petromyzonamine disulfate, and petromyzosterol disulfate. Mass spectrometry analysis of spermiating male washing extract revealed the main component as petromyzonol sulfate. Electro-olfactogram was performed on adult Pacific lamprey to determine the sensitivity and specificity of the compounds. EOG analysis revealed that the olfactory system of Pacific lamprey was able to detect identified compounds at low concentrations. This study may suggest that the identified compounds have pheromonal roles in Pacific lamprey. Further research is required to confirm the biological roles of the compounds.

BROWN AND RAINBOW TROUT MOVEMENT PATTERNS IN THE PINE RIVER, MANISTEE COUNTY, MICHIGAN, RELATIVE TO THE REMOVAL OF STRONACH DAM

Mart Williams

Mentor(s): Dana Infante (Fisheries and Wildlife)

Currently, little research has explored dam removal effects on rivers, yet successful fisheries management depends on this knowledge. Therefore, my research will consider whether the 2003 removal of Stronach Dam, Pine River, Michigan influenced Brown and Rainbow trout movement. I will look for trout movement pre-dam and post-dam removal between three zones: a reference zone upstream of the dam site, an impoundment zone immediately upstream of the dam site and a downstream zone immediately below the dam site. First, I anticipate observing trout movement between the impoundment and

downstream zones, since the dam blocked fish passage. Further, I predict that trout located in downstream and reference zones will move into the impoundment zone in response to increased trout habitat created by dam removal. I will summarize 11 years of mark/recapture data to determine sample sizes for both trout species. Utilizing a contingency table and resulting chi-squared value will show whether the number of trout captured in the impoundment zone differed significantly between pre-dam and post-dam removal. To test the first hypothesis, I will consider trout movement between impoundment and downstream zones. To test the second hypothesis, I will consider differences in movement from downstream and reference zones into the impoundment zone, post-dam removal. Better understanding of dam removal effects on trout will provide insights for fisheries management and also suggest ways that dams could be impacting other organisms.

RECYCLING BEHAVIOR STUDY

Aimee Wilson

Mentor(s): Joe Arvai (Community, Agriculture, Recreation and Resource Studies), Michael Kaplowitz (Community, Agriculture, Recreation and Resource Studies), Laurie Thorp (RISE)

During fall 2007, Michigan State University students, staff, and faculty participated in a web-based survey on recycling. The survey was designed to complement focus groups, individual interviews, and a short faculty survey previously administered by the research team. The results will inform decision making as the campus implements a new recycling facility. Survey questions addressed a wide range of recycling related issues including communication strategies and preferred program infrastructure. Preliminary data analysis suggests the campus population is more receptive to information on how, what, and where to recycle than reasons why they should do so. The data also indicate students would prefer promotional communication while faculty and staff would prefer personal contacts and posters. Further data analysis should provide incite as to preferences regarding recycling materials, drop-off location, and other infrastructural features.

THE NUTRITIONAL EFFICACY OF MARE'S MILK IN NEONATAL PIGS: A MODEL FOR THE HUMAN INFANT

Emma Wils-Plotz

Mentor(s): Nathalie Trottier (Animal Science)

For infants that are unable to obtain human breast milk, cow's milk has been the major substitute. But in recent studies, mare?s milk has shown a greater composition resemblance to human milk than that of the cow. Very few scientific studies on the nutritional benefits of mare's milk, compared to cow's milk, on infants are available. Ample studies are available demonstrating the usefulness of the neonatal pig in human infant nutrition (Burrin et al.). The neonatal pig as a model will allow us to study the nutritional benefits of mare's milk and as such, will represent an initial step in testing the adequacy of mare?s milk as an alternative to cow and soy-based infant formula.

HYDRATION STATES OF MARS RELATED SULFATE MINERALS

Peter Wilton, Joshua Zimmerman

Mentor(s): Michael Velbel (Geological Sciences)

Images, as well as chemical and spectroscopic data, acquired from Mars orbiter and rover missions provide a variety of evidence that there was once water on the surface of Mars. Mars Exploration Rover studies of rocks in the Meridiani Planum region of Mars have revealed the formation of crystal molds, as well as veining and polygonal fracturing that is suggestive of volume change. Similar polygonal fracturing occurs at a much smaller spatial scale in some Mars meteorites. Among the possible reasons proposed for the observed volume changes are dehydration reactions of sulfate minerals. Magnesium sulfate has been identified as a main constituent in Mars rocks and soil, in varying amounts. Sulfate minerals have many hydration states (i.e., the number of water molecules attached to the sulfate is known to change depending on the relative humidity of the surrounding air); magnesium sulfates having the most with seven. This study examines crystallographic parameters of Mars-related sulfates and calculates the volume change associated with hydration-dehydration reactions between sulfate-mineral pairs. In doing so it attempts to determine whether the amounts of volume change observed in fractured Martian S-rich materials can provide clues to help reveal the identity of the pre- and post-fracturing minerals present.

POTENTIAL NITROGEN CONTRIBUTION TO THE ENVIRONMENT FROM SIX TYPES OF EQUINE BEDDING

Jenee Witherspoon

Mentor(s): Dr Brian Nielsen (Animal Science)

This study was designed to determine the potential nitrogen (N) contribution to the environment of six types of bedding used for horses (straw, chopped straw, wood pellets, processed corn cobs, peat moss, or wood shavings). In a 6x6 Latin square design, six horses were housed on each of the beddings during six periods, with each period lasting seven days. The stalls were bedded with the above treatments to a depth of 12.5 cm. Stalls were cleaned daily and bedding was added as needed to maintain the 12.5 cm depth. A 10% representative sample of the waste was collected upon removal. From those samples, a composite was taken for each period and then stored at -20° C. The samples were ground and tested for N concentration. There was a difference between beddings for amount of bedding removed ($P = 0.003$; peat moss and corn cobs had less removed than the other bedding types) and for the concentration of N in the bedding waste ($P < 0.0001$). Peat moss contained the highest N concentration (2.1%), followed by wood pellets (1.6%), corn cobs (1.4%), chopped straw (1.3%), straw (1.2%), and shavings (1.1%). Calculating the usage rate and N content of these bedding materials will aid in determining which bedding is the most environmentally friendly and this knowledge may be used to reduce environmental N emissions.

FACEBOOK @ MSU: STUDENT ATTITUDES AND USAGE

Krysette Wohlgemuth, Jason Brunton, Kaitlynn Murphy, Nirali Patel

Mentor(s): Kristen Renn (EAD)

In this project, we conducted an online survey about student attitudes about and uses of facebook. In this survey we asked students about their general usage of the social network, types of interaction, attitudes about faculty usage and correlations between usage of facebook and general academic information. The main focus of this project is to determine whether or not facebook has any educational benefits or is simply a distraction.

PUBERTAL EXPOSURE TO HIGH FAT DIET CAUSES STRAIN-DEPENDENT ALTERATIONS IN MAMMARY GLAND DEVELOPMENT AND ESTROGEN RECEPTOR STATUS IN MICE

Sarah Woiderski

Mentor(s): L Karl Olson (Physiology)

Increased body weight and adiposity have been associated with reduced risk of premenopausal breast cancer. Elevated adiposity during puberty may alter breast cancer risk by perturbing breast development, which may have long-term consequences on function and hormonal responsiveness of the adult gland. To investigate the impact of pubertal obesity on breast development, C57BL/6 and Balb/c mice were fed a high fat diet (HFD) from weaning (3 wks old) to 7 weeks of age. The HFD consisted of 60% kcal fat, 20% kcal carbohydrate and 20% kcal protein, whereas the control diet (CD) was 10% kcal fat, 70% kcal carbohydrate and 20% kcal protein. C57BL/6 mice fed a HFD for 4 wks were significantly heavier than CD fed mice. Consistent with increased adiposity, C57BL/6 mice fed a HFD had elevated leptin levels, diminished glucose tolerance, and increased parametrial and breast fat pad weights. In HFD fed C57BL/6 mice, the mammary ductal epithelium failed to completely infiltrate the fat pad and had a diffuse structure with less developed terminal end buds (TEBs) compared to CD fed mice. These morphological changes were associated with a marked reduction in the expression of estrogen receptor □ (ER□) in ductal epithelial cells and a less profound reduction in the percentage of progesterone receptor A-positive cells. Next, C57BL/6 mice fed CD or HFD for 4 wks were ovariectomized (OVX) to study the effect of obesity on estrogen (E) and/or progesterone (P) regulation of TEB formation.

ERADICATING GUINEA WORM DISEASE: LESSONS FROM UGANDA AND GHANA

Laura Wolaver

Mentor(s): Tobin Craig (James Madison College)

Dracunculiasis, more commonly known as Guinea worm disease, is a parasitic disease, spread through infected water, that is targeted by the World Health Organization for global eradication. On the basis of an understanding of the pathology and mode of transmission that enables Dracunculiasis to be a candidate for eradication, as well as the history of the global eradication campaign, I have undertaken a comparative case study of Uganda's successful eradication effort and Ghana's struggling campaign. While both countries have had to deal with cultural opposition to public health intervention in addition to regional instability, I found that Uganda's program combined strong political will, intensive public health education, community

empowerment, information sharing, and consistent funding to accomplish eradication, while Ghana's campaign focused primarily on developing new sources of safe water and has experienced setbacks in construction and funding. In order for Ghana's eradication campaign to move forward, more attention may need to be focused on basic health education, treatment of current water sources, and stable financing. The triumphs and challenges of the eradiation efforts in Uganda and Ghana are representative of the greater struggle in this worldwide effort targeting global eradication by 2009. As potentially the second disease to be eradicated globally, Dracunculiasis may show the way for future success in global public health initiatives.

ABAKUÁ SECRET SOCIETY: RELIGION, RACE AND CULTURE IN THE URBAN MATRIX OF CUBA

Andrew Woodson
Mentor(s): Jualynne Dodson (Sociology)

This paper examines the Abakuá Secret Society of Cuba in order to determine how its members navigated the expressively harsh Cuban ensemble of social relations, institutions, and practices of the colonial "contact zone." In so doing, I will emphasize the ways in which African descendants exploited contradictions inherent to capitalist social relations that characterized the colony of Cuba. The Abakuá secret society is an all male African based religious collective that emerged from the western port cities of Cuba in the early part of the 19th century. Since its inception, in 1836, the Abakuá secret society has had an immense social, economic, and political impact on Cuba's social and historical trajectory. I wish to demonstrate that epistemological and ontological dispositions inherited from those that formed secret societies in Nigerian Delta facilitated Black people in Cuba's western port cities to live in contradistinction to a social order antithetical to their well-being, by way of the Abakuá secret society. In addition, I wish to explicate the import of probing the intersection of religion, race, and culture for a sufficient investigation of African descendants in the Americas. To demonstrate this, I introduce the concepts of religion, race, and culture and proceed by lodging further elaboration of these concepts in a discussion of the 19th century origins and mission of Abakuá in the socio historical continuum of Cuba.

STRUCTURAL DETERMINATION AT SPACETIME LIMITS

Richard Worhatch
Mentor(s): Chong-Yu Ruan (Physics and Astronomy)

Nanostructured materials show novel physical, chemical, and biological properties that are different from their counterparts in the bulk phase. Nanocrystals can be used as the building blocks for advanced devices, which promise highly specific, high-speed performance at an exceedingly high packing density for many purposes, such as electronics, optics, magnetism, catalysis, sensing, and quantum computing. Characterizing the underlying size- and shape- dependent processes, such as phase transition, transport, and chemistry, involving changes on the sub-angstrom and the femtosecond-picosecond time scale, requires unprecedented combined space-time resolution. The Ultrafast Electron Crystallography (UEC) Lab at MSU has recently demonstrated such probing capability in studying dynamics of photo-excited nanoparticles. However, there is currently no well-defined refinement procedure to invert the three dimensional atomic structures from the excited state diffraction data as the basic symmetry rules on which crystallography is based do not apply. One approach that does not depend on lattice symmetry is to analyze structural changes using the Reverse Monte Carlo method to create snap-shot atomic models for each stage of the evolving structures. Some advantages and difficulties pertaining to this underconstrained structural refinement method are discussed along with a demonstration of the effectiveness of the technique based on analyzing the impulsively driven photo-melting of gold nanoparticles studied recently in the UEC Lab.

VARIABLE AQUEOUS ALTERATION AMONG CARBONACEOUS CHONDRITES

Michael Wright
Mentor(s): Michael Velbel (Geological Sciences)

Primitive meteorites (chondrites) preserve evidence of conditions in the early solar system, predating most of Earth's heavily modified early geologic record. Some members of one meteorite group (carbonaceous chondrites) preserve evidence of interactions of water with minerals on the ancestral parent bodies now preserved as asteroids. Type 2 carbonaceous chondrites contain hydrous minerals (minerals containing structural water) formed by hydration of anhydrous high-temperature minerals condensed from the solar nebula. However, these processes ceased to operate on chondrite parent bodies within the first few tens of millions of years in the early solar system, so details of the timing, duration and movement of the water that drove the hydration reactions must be inferred from textural and compositional relationships preserved in the meteorite samples.

Different CM2 carbonaceous chondrites were altered by water to different degrees on their parent bodies. Several alteration scales have been proposed for CM2 chondrites; one simple measure in one alteration scale is the volume percent isolated matrix silicates. New analyses of two different samples of Nogoya (CM2) show narrow and non-overlapping ranges, suggesting textural heterogeneity within the Nogoya meteoroid on a scale larger than each individual sample. These results differ from those acquired by previous work on other samples of Nogoya, further supporting the possibility of larger-than-sample scale heterogeneity in the Nogoya meteoroid. Similar analyses of samples of several other previously studied meteorites are in progress.

FRESHMAN BRASS QUINTET

Michael Wright, Simon Holoweiko, Mark Hsieh, Kevin Phillips, Kevin Smith

Mentor(s): Janine Gaboury (Horn Professor)

We will be performing live music that we have been working on all year as a group.

SOME PROPERTIES OF GENERALIZED FIBONACCI POLYNOMIALS

Jeffrey Wyka, Dale Chapman

Mentor(s): Aklilu Zeleke (Lyman Briggs)

Let a Fibonacci polynomial sequence be given by P0(x)=B, P1(x)=Ax+B, and for n n>=2 , Pn(x)=xPn-1(x)+Pn-2(x). We discuss asymptotic behavior of the maximum roots of Pn and give closed forms for the coefficients of the terms of Pn.

DEVELOPMENTAL EXPRESSION OF PPR PROTEINS IN TRYPANOSOMA BRUCEI

Zachary Zalewski

Mentor(s): Donna Koslowsky (MMG)

One of the many virulent parasites affecting the Third World is the African Trypanosome. Members of the kinetoplastid protozoa, trypanosomes are responsible for the spread of diseases endemic to Africa, including sleeping sickness in humans, Nagana in cattle and both visceral and cutaneous Leishmaniasis. Within its insect vector, the tsetse fly, procyclic Trypanosoma brucei contain an intact, fully functional mitochondrion. When transmitted into a mammalian host, the bloodstream form lacks both cytochromes and Kreb cycle enzymes, and are dependent on glycolysis for energy production. The complex life cycle affords opportunities to explore aspects in the regulation of mitochondrial gene expression. A class of organellar proteins, characterized by pentatricopeptide repeat (PPR) structural motifs, have recently been identified in T. brucei. These proteins play an important role in RNA processing and editing pathways in the mitochondria. Since mitochondrial genes are developmentally regulated, we hypothesize that the expression of the PPR mRNAs are developmentally regulated throughout the trypanosome's complex life cycle. Our early qPCR data suggests that the PPR mRNA levels are differentially regulated between the procyclic and bloodstream forms. Using a Ribonuclease Protection Assay, I am quantitating mRNA levels of the PPRs in order to elucidate their regulation across the life cycle.

AN ANALYSIS OF PRESSURE EXERTED BY DIFFERENT STYLES OF WINTER BLANKETS ON THE WITHERS OF HORSES

Lila Zarski

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

It is known that a poor fitting winter blanket can cause discomfort, and even pressure sores on the horse, especially in the area of the shoulders and the upper spine. Necrosis of the skin may develop even when exposed to a relatively low pressure for a long period of time. Many factors can contribute to the fit of, and therefore pressure exerted by a blanket including the conformation of the horse and style of the blanket. In this study we wish to determine if certain styles of winter blankets are more likely to cause pressure sores by measuring the forces exerted on the horse with a thin pressure mat placed between the blanket and the horse's withers. Because of the technology available, the focus will be on the withers and upper back. Pressure measurements will be collected from twelve horses both standing and walking with each of three styles of blankets. There will be three trials of five seconds for each of the conditions. The data will then be analyzed to find a link between one particular style of blanket and increased pressure in the area of the withers. At the conclusion of the study we will be able to advise on whether one style of blanket could be considered more or less likely to cause pressure sores, or if the fit truly is dependent on the individual conformation of the horse.

MUSLIM AMERICAN IDENTITY

Nada Zohdy
Mentor(s): Mohammed Ayoob (James Madison College)

Since that auspicious day on September 11, 2001, the importance of addressing the critical question of who American Muslims are has risen. The American public has grown increasingly interested in the Muslims in their midst and in response, many Muslim Americans have been encouraged to construct an identity for themselves, especially in light of distorted media representations. Such all-encompassing stereotypes disguise the essential fact that the Muslim American experience is by no means monolithic. Indeed, this is perhaps the only way to define such a multi-dimensional identity succinctly. While ethnic diversity may be a visible source of this heterogeneity, other forces tug this notion in many different directions, making the Muslim American identity akin to a kaleidoscope- comprised of many unique, overlapping patterns that create a larger, constantly evolving identity. This essay reviews three texts on Muslim American identity. While two books glimpse into the lives of myriad Muslim Americans, the Pew Report illuminates these narratives with demographic information that allow readers to situate individual stories into the broader context, helping to reach a more comprehensive understanding. By elaborating upon the most salient themes in these texts (American Islam: The Struggle for the Soul of a Religion- Paul M. Barrett; Mecca and Main Street: Muslim Life in America after 9/11- Geneive Abdo; the Pew Research Report, "Muslim Americans: Middle Class and Mostly Mainstream"), the objective of this analysis is to contribute to an understanding of who Muslim Americans are by navigating the arena in which their identity is formulated.

PETROGRAPHY OF ANTARCTIC CM2 CARBONACEOUS CHONDRITE EET83250

Jesse Zrull
Mentor(s): Michael Velbel (Geological Sciences)

Primitive chondrites provide scientific insight into the history of the solar system. Those recovered relatively soon after impact with the earth can be studied before the effects of terrestrial weathering alter the composition of the meteorite. Furthermore, interactions between water and minerals of the parental bodies of these meteorites (asteroids) can be studied. Members of the Type 2 carbonaceous chondrite family, including EET83250, contain structural water; water with which anhydrous minerals interacted during the first 10 million years of the early solar system. Because these reactions have long since ceased, only textural and compositional evidence can be determined from these chondrites. This study acquires scanning electron microscope images and energy-dispersive X-ray elemental maps of EET83250, a meteorite that has been studied previously. Specifically, we are examining elemental maps of tabular sulfide structures. The "blades" are composed primarily of iron and sulfur. These results form a basis for comparison of sulfide evidence for aqueous alteration in this meteorite with other evidence for aqueous alteration in this meteorite, and with evidence for sulfides in other CM2 chondrites.

GMOS IMPLEMENTATION AND REGULATION AROUND THE WORLD

Jesse Zuehlke
Mentor(s): Rhonda Crackel (Food Science)

Recombinant DNA technology has allowed for the genetic modification of a variety of food products, especially in agriculture. Currently many of the commercial genetically modified organisms have characteristics for pesticide resistance or improved growth. There is widespread use in some countries and strong resistance in others. This study focuses on the differing presences of GMOs worldwide and the regulations in different countries. An important aspect influencing the regulations is consumer acceptance, which is also analyzed.

Index of Presenters

Student participants are listed alphabetically by last name.

Student Name	Time/Room	*Project Title*	Page
Aardema, Matthew	11:45 AM Lake Erie Room	*VARIATION IN A FEMALE SECONDARY SEXUAL CHARACTERISTIC MAY EXPLAIN ASYMMETRICAL MALE MATE SELECTION IN TIGER SWALLOWTAIL BUTTERFLIES, PAPILIO GLAUCUS AND P CANADENSIS*	26
Ackerson, Michael	9:30 AM Ballroom	*STRATIGRAPHIC HISTORY AND GEOCHEMICAL ANALYSIS OF TRIASSICJURASSIC VOLCANIC ROCKS IN THE ALASKA RANGE, SOUTHCENTRAL ALASKA*	26
Adama, Emily	10:45 AM Gold Room B	*USING RELATIONSHIPS TO FIGHT POVERTY*	26
Affonso, Carmen	1:30 PM Ballroom	*ENDOTHELIN 1 DOWNREGULATES NOREPINEPHRINE TRANSPORTER VIA ENDOTHELIN B RECEPTORS*	27
Agha, Wesam	9:30 AM Ballroom	*JURY PREDELIBERATION DISCUSSION IN CIVIL TRIALS*	43
Ahammad, Zakir	1:30 PM Ballroom	*REGULATION OF ACE2 GENE EXPRESSION BY THE ANGIOTENSINS*	27
Albrecht, Nicole	9:30 AM Ballroom	*GUIDE RNA TARGETING IN KINETOPLASTID RNA EDITING*	27
Aldasouqi, Dua	1:30 PM Ballroom	*MOST EFFICIENT BAKING MATERIAL*	28
Allen, Whitney	10:00 AM Green Room	*EQUINE ANATOMY STUDY*	28
Almendinger, Megan	9:30 AM Ballroom	*JURY PREDELIBERATION DISCUSSION IN CIVIL TRIALS*	43
Ambrose, Jeffrey	9:45 AM Gold Room A	*MODIFICATION OF CREATINE TRANSPORTER EXPRESSION IN MUSCLE CELLS*	28
Anadumaka, Chike	9:30 AM Ballroom	*DIOXYGENASE GENE DIVERSITY*	28
Anderson, Whitney	9:30 AM Ballroom	*JURY PREDELIBERATION DISCUSSION IN CIVIL TRIALS*	43
Anderson, Bradley	11:30 AM Lake Erie Room	*CAN BRAIN FUNCTIONAL MRI MEASURE CENTRAL DRIVE DURING MUSCLE CONTRACTIONS*	29
Aravamuthan, Srikanth	1:00 PM Gold Room B	*HISTORY OF THE DOCTORPATIENT RELATIONSHIP IN WESTERN MEDICINE*	29
Arbitter, Benjamin	2:30 PM Tower Room	*KNOWLEDGE AND OPINIONS CONCERNING INTERNATIONAL AFFAIRS*	39

Student Name	Time/Room	*Project Title*	Page
Arham, Hamood	9:30 AM Ballroom	*ELECTRON SPIN MEMORY LENGTH IN PD NI ALLOY*	29
Asanuma, Natsumi	9:30 AM Ballroom	*UNIVERSITY STUDENTS GENDER STEREOTYPES ATTRIBUTED TO JAZZ PIANO MUSIC*	29
Astrein, Jeffrey	1:45 PM Tower Room	*AMERICAN INDIAN POVERTY*	30
Aughton, Laura	9:30 AM Ballroom	*HIGH SCHOOL BULLIES*	91
Austin, Allison	1:30 PM Ballroom	*COMMUNITY BASED RESEARCH FOR MEDICALLY UNDERSERVED WOMEN*	65
Babcock, Lori	1:00 PM Gold Room A	*THE SEDIMENT RECORD OF PRODUCTIVITY FROM OLIGOTROPHIC LAKES: A MULTIELEMENT APPROACH*	30
Baber, Kelesha	1:15 PM Lake Huron Room	*HAND AND CIRCLE GAMES: BLACK FEMALES AND SELFESTEEM*	30
Bach, Hannah	2:30 PM Tower Room	*KNOWLEDGE AND OPINIONS CONCERNING INTERNATIONAL AFFAIRS*	39
Baig, Kareem	1:30 PM Ballroom	*BEES AND THEIR EFFECT ON POLLINATION*	31
Baker, Nicole	1:30 PM Ballroom	*PPR PROTEINS OF TRYPANOSOMA BRUCEI: CLONING, EXPRESSION, AND CRYSTALLIZATION*	31
Balgooyen, Laura	1:30 PM Green Room	*IMPACT OF EQUINE NUTRITION PRACTICES ON ENVIRONMENT*	68
Bandemer, Brian	1:30 PM Ballroom	*PHANTOM SMOKING*	31
Baranski, Marci	1:30 PM Ballroom	*BIOCHEMICAL CHARACTERIZATION OF THE ESSENTIAL GTPASE RBGA*	31
Barry, Megan	1:30 PM Ballroom	*GENETIC BASIS FOR VITAMIN B12 MALABSORPTION IN HUNGARIAN KOMONDORS*	32
Bart, Alan	1:30 PM Ballroom	*CUTTING RED TAPE OR PLAYING FAVORITES A COMPARISON OF BUSINESS DEVELOPMENT PNESTOP SHOPS IN THE GREAT LAKES ECONOMIC REGION*	32
Bates, Adam	9:30 AM Ballroom	*CHARACTERIZATION OF PAP AND FOC FIMBRIAL GENE EXPRESSION IN UROPATHOGENIC E COLI USING LUX REPORTER SYSTEM*	32
Bauson, Laura	2:45 PM Green Room	*EVALUATING THE ADDITION OF POSITIVE REINFORCEMENT FOR LEARNING A FRIGHTENING TASK A PILOT STUDY WITH HORSES*	33
Beasley, Darius	9:30 AM Ballroom	*DEFINITENESS AND INDEFINITENESS IN CHILDRENS INTERPRETATION OF VERBAL ASPECT*	33

Student Name	Time/Room	*Project Title*	Page
Beason, John	2:30 PM Gold Room B	*THE JOSHUA GENERATION: HIPHOP, STREET TRIBES, AND THE DEVELOPMENT OF YOUTH CULTURE IN BENTON HARBOR, MI 1980PRESENT*	33
Beiser, Katie	9:30 AM Ballroom	*DISTRIBUTION OF RUST IN CARBONACEOUS CHONDRITE, AND IMPLICATIONS FOR DIFFERENTIAL PERMEABILITY OF MATRIX, RIM AND CLAST MATERIALS ON THE CM CHONDRITE PARENT BODY*	80
Bell, Jacob	9:30 AM Ballroom	*EXPLORING SNAP BRACELETS WITH SEM*	33
Benoit, Dayna	9:30 AM Ballroom	*COMPARISON OF TOOTH STRUCTURES*	34
Benson, Dana	1:30 PM Ballroom	*ENERGY CONSUMPTION IN RESIDENCE HALLS*	84
Berkowitz, Michael	9:30 AM Ballroom	*RELATIONSHIP BETWEEN KNOWLEDGE OF INTERNATIONAL AFFAIRS AND SOURCE OF INFORMATION*	34
Bickerstaff, Chelsea	1:30 PM Ballroom	*IMPACT OF EQUINE NUTRITION PRACTICES ON THE ENVIRONMENT AND ECONOMICS*	34
Bjorkman, Kurt	3:00 PM Tower Room	*ORGAN DONATION: A COMPARATIVE STUDY*	90
Blaine, Allison	9:30 AM Ballroom	*A SEARCH FOR NOVEL MUTATIONS CONFERRING SPECTINOMYCIN RESISTANCE IN CHLAMYDOMONAS REINHARDTII*	34
Blair, Lauren	9:30 AM Ballroom	*ELECTRON BACKSCATTER DIFFRACTION OF METALLIC ALLOYS STUDIES*	34
Blase, Bryan	1:30 PM Ballroom	*CAN BRAIN FUNCTIONAL MRI MEASURE CENTRAL DRIVE DURING MUSCLE CONTRACTIONS*	35
Bliton, Nathaniel	11:30 AM Parlors ABC	*LIGHT MUSIC*	55
Bliton, Nathaniel	2:45 PM Lake Huron Room	*MULTIMEDIUM MUSIC COMPOSITION*	35
Block, Megan	11:00 AM Gold Room B	*COMMUNITIES AS LEADERS IN REVERSING ECONOMIC DECLINE: REBUILDING CIVIL SOCIETY, INSTITUTIONS, AND LEADERSHIP CAPACITY TO GROW LOCAL ENTREPRENEURS*	35
Bonnen, Kathryn	3:00 PM Gold Room A	*MATHEMATICAL STRATEGIES FOR TWOPERSON COMBINATORIAL GAMES*	35
Bonner, Will	10:30 AM Parlors ABC	*TOUCH N GO: A PHYSICALLY INTERACTIVE COMPUTER GAME*	36
Borycki, Kelly	1:30 PM Ballroom	*THE EFFECTS OF EMOTICONS ON INTERPERSONAL EVALUATIONS OF THEIR USERS*	36

Student Name	Time/Room	*Project Title*	Page
Boyers, Alicia	9:30 AM Ballroom	*FACEBOOK @ MSU: FACULTY USAGE AND ATTITUDES*	111
Boylan, Clayton	1:30 PM Ballroom	*MOBILE CONTENT SERVICES: A CASE OF OAKLAND COUNTYS EGOVERNMENT*	36
Bradley, Christopher	9:30 AM Ballroom	*BIODIVERSITY WITHIN PSYCHROBACTER SPP*	36
Brandon, Whittney	2:00 PM Tower Room	*Delay of Game: The Lack of Black Representation in Leadership in College Football*	37
Brandt, Amy	9:30 AM Ballroom	*HOSTILE CAMPUSES: THE IMPACT OF SEXUAL HARASSMENT AND INCIVILITY ON THE PSYCHOLOGICAL WELLBEING OF COLLEGE STUDENTS*	37
Bridges, Brandi	1:45 PM Lake Huron Room	*BLACK LABORWHITE WEALTH: THE BLACK MALE ATHLETES QUEST TO FIND HIS OWN*	38
Briggeman, Trevor	9:30 AM Ballroom	*GENE SILENCING OF ALC AND IND IN RICE*	38
Brockschmidt, Emily	1:30 PM Ballroom	*AN ANALYSIS OF HEALTH COMMUNICATION RESEARCH: IS HEARING LOSS ACCOUNTED FOR?*	110
Brooks, Emily	1:30 PM Ballroom	*COMMUNITY HEALTH WORKERS IMPACT ON CANCER EDUCATION*	47
Brown, Teresa	2:30 PM Tower Room	*KNOWLEDGE AND OPINIONS CONCERNING INTERNATIONAL AFFAIRS*	39
Brown, Alexander	11:30 AM Gold Room A	*AP-1 AND ETS ACTIVATION LEVELS IN CANCEROUS AND NORMAL MAMMARY CELLS*	38
Brown, Lauren	1:30 PM Ballroom	*COMMUNITY BASED RESEARCH FOR MEDICALLY UNDERSERVED WOMEN*	65
Browning, Sarah	1:30 PM Ballroom	*FUNCTIONAL ANATOMY OF READING STORIES VERSUS SOLVING MATH PROBLEMS USING FMRI*	53
Brumbill, Megan	11:00 AM Parlors ABC	*EMBODYING SOCIAL ADVOCACY*	81
Brune, Amanda	9:30 AM Ballroom	*EARLY ADOLESCENT POSITIVE AFFECT AND YOUNG ADULT HEALTH OUTCOMES*	39
Brunton, Jason	9:30 AM Ballroom	*FACEBOOK @ MSU: STUDENT ATTITUDES AND USAGE*	114
Brunton, Jason	1:30 PM Ballroom	*CONSERVATION OF TRYPTOPHAN REPRESSOR:DNA OPERATOR COMPLEXES*	101
Buccilli, Sara	9:30 AM Ballroom	*MUSIC THERAPY INFLUENCES IN AREAS OF SOCIAL AND COMMUNICATION IN AN ADULT WITH FRAGILE X SYNDROME*	39

Student Name	Time/Room	*Project Title*	Page
Budde, Rebecca	11:15 AM Lake Huron Room	*A SENSE OF PLACE*	39
Bul, Lauren	1:30 PM Ballroom	*CONDUCTOMETRIC DETECTION OF ESCHERICHIA COLI 0157:H7*	39
Burns, Cameron	9:30 AM Ballroom	*INVESTIGATING MICROORGANISMS AS A FOOD SOURCE FOR MOSQUITO LARVAE*	40
Busk, Rebecca	2:30 PM Lake Superior Room	*RAPID DETECTION OF E COLI IN RECREATIONAL WATERS*	40
Callahan, Meg	9:30 AM Ballroom	*P33 AND ITS IMPORTANCE TO BACULOVIRUS INFECTIONS*	40
Campbell, Aimee	1:30 PM Ballroom	*THE EFFECT OF GLUCOSAMINE AND CHONDROITIN SULFATE ON PORCINE CARTILAGE*	40
Campbell, Allison	10:30 AM Tower Room	*PUBLICPRIVATE PARTNERSHIPS AT THE BASE OF THE PYRAMID: FROM BUZZWORD TO RESULTS*	41
Canever, Laura	1:30 PM Ballroom	*ENERGY CONSUMPTION IN RESIDENCE HALLS*	84
Cann, Gillian	9:30 AM Ballroom	*RELATIONSHIP BETWEEN KNOWLEDGE OF INTERNATIONAL AFFAIRS AND SOURCE OF INFORMATION*	34
Carman, Michael	1:45 PM Gold Room B	*GLOBALIZATION AND HUMAN DEVELOPMENT*	41
Carr, David James	9:30 AM Ballroom	*HIGHLY AMPLIFIED BIOBARCODE DNA BIOSENSOR FOR THE DETECTION OF SALMONELLA ENTERITIDIS*	41
Carter, Korey	2:45 PM Gold Room A	*FRACTAL IMAGES AND ITERATED FUNCTION SYSTEMS*	42
Castro, Brian	9:30 AM Ballroom	*APTAMER SELECTION FOR MICROORGANISM DETECTION PRELIMINARY ASSAYS*	42
Cavicchioli, Susan	1:30 PM Ballroom	*REDUCING BOTTLED WATER WASTE*	42
Chagas, Christian	1:30 PM Ballroom	*THE ROLE OF THE INSULIN SIGNALING PATHWAY IN ORGAN GROWTH AND SIZE REGULATION*	49
Chapman, Dale	2:30 PM Gold Room A	*SOME PROPERTIES OF GENERALIZED FIBONACCI POLYNOMIALS*	116
Chatterley, Lucan	1:30 PM Ballroom	*CREATING A WEB BASED TUTORIAL FOR COMMUNITY HEALTH WORKERS*	95
Chehab, Ali	1:30 PM Ballroom	*SECOND LIFES INFLUENCE ON USER INTENTION FOR EGOVERNMENT SERVICES IN CONTRAST TO 2D WEBSITES*	42

Student Name	Time/Room	*Project Title*	Page
Chehab, Ali	1:30 PM Ballroom	*HOW DIFFERENT INTERFACES EFFECT CONSUMER PURCHASING INTENTIONS*	43
Chen, Yang	1:45 PM Lake Erie Room	*LOSS OF FACE, SOCIAL ANXIETY, AND DEPRESSION AMONG ASIAN AMERICAN AND EUROPEAN AMERICAN COLLEGE STUDENTS*	43
Choi, Dae	1:30 PM Ballroom	*CREATING A WEB BASED TUTORIAL FOR COMMUNITY HEALTH WORKERS*	95
Cipri, Caitlin	9:30 AM Ballroom	*JURY PREDELIBERATION DISCUSSION IN CIVIL TRIALS*	43
Clark, Tara	1:30 PM Ballroom	*DUBLIN AND BOSTON: CITIES OF SUCCESSFUL CIVIL ASSOCIATIONS*	44
Cline, Sarah	1:30 PM Green Room	*IMPACT OF EQUINE NUTRITION PRACTICES ON ENVIRONMENT*	68
Cohan, Lindsey	10:15 AM Tower Room	*THE INFLUENCE OF MORAL PHILOSOPHY ON ETHICAL DECISION MAKING*	44
Cohen, Andrea	1:30 PM Ballroom	*IMPACT OF EQUINE NUTRITION PRACTICES ON THE ENVIRONMENT AND ECONOMICS*	34
Coku, Ardian	1:30 PM Ballroom	*THE ROLE OF A NOVEL DNAJLIKE PROTEIN IN FATTY ACID METABOLISM*	44
Constantine, Kara	1:30 PM Ballroom	*RESILIENCE WITHIN HEAD START PRESCHOOLERS: PREVALENCE OF DECA PROTECTIVE*	44
Cooper, David	10:30 AM Lake Superior Room	*THE SHOW EPISODE 63 HOBOS LOVE HOT CHOCOLATE*	45
Copus, Jennifer	1:30 PM Tower Room	*RECYCLING IN MICHIGAN*	94
Cotter, Rebecca	9:30 AM Ballroom	*EVOLUTION OF BACTERIAL CHROMOSOME SIZE*	45
Couch, Steven	1:45 PM Lake Superior Room	*BIOTECHNOLOGY COMMUNCATION AND OUTREACH STUDY IN SOUTH AFRICA*	45
Cousino, Melissa	1:15 PM Lake Erie Room	*CONTRIBUTING FACTORS OF JUVENILE DEPRESSION IN ADOLESCENTS WITH ADHD*	45
Couture, Shawna	1:30 PM Ballroom	*JUICY CAMPUS*	46
Curtis, Megan	1:30 PM Ballroom	*NEW DIGITAL DEVICES AND ACADEMIC WORK*	48
Daenzer, Katie	1:30 PM Ballroom	*REDUCING BOTTLED WATER WASTE*	42

Student Name	Time/Room	*Project Title*	Page
Darden, Doug	12:00 PM Lake Erie Room	*COMPARING BRAIN ACTIVATION BETWEEN READING STORIES AND SOLVING MATH PROBLEMS USING FMRI*	91
Darling, John	1:30 PM Ballroom	*GREEN ROOF COST BENEFIT ANALYSIS*	103
Deighan, Sarah	1:30 PM Ballroom	*COMPARISON OF THE DIFFERENCES BETWEEN 2-D AND 3-D FOR DIFFERENT AGE GROUPS*	46
Deighan, Sarah	1:30 PM Ballroom	*SECOND LIFES INFLUENCE ON USER INTENTION FOR EGOVERNMENT SERVICES IN CONTRAST TO 2-D WEBSITES*	42
Delavari, Nader	1:30 PM Ballroom	*NADER SHAHS RELIGIOUS REFORMS: INSIGHT TO CONTEMPORARY POLITICAL ISLAM*	46
DePas, William	9:30 AM Ballroom	*CONSTRUCTION OF AN IMPROVED ADENOVIRUS BASED VACCINE BY EXPRESSION OF AN EIMERIA SPP DERIVED PROTEIN*	46
Deska, Katie	10:15 AM Lake Huron Room	*POSTFEMINISM AND WOMENS MUSIC*	47
Devereaux, Lisa	9:45 AM Tower Room	*CUSTOMER RELATIONSHIP MANAGEMENT SOFTWARE ANALYSIS*	88
DeVries, Karl	1:30 PM Ballroom	*IMPACTS OF BOTTLED WATER USE BY STUDENTS ON THE MICHIGAN STATE UNIVERSITY CAMPUS AND PROMOTION OF AVAILABLE ALTERNATIVES*	106
Dhandha, Maulik	11:30 AM Lake Erie Room	*CAN BRAIN FUNCTIONAL MRI MEASURE CENTRAL DRIVE DURING MUSCLE CONTRACTIONS*	29
Dietrich, Monika	1:30 PM Ballroom	*COMMUNITY HEALTH WORKERS IMPACT ON CANCER EDUCATION*	47
Dinh, Thao	9:30 AM Ballroom	*CHILDREN'S USE OF PROSODY TO DETERMINE SYNTACTIC STRUCTURE*	101
Dinh, Thao	9:30 AM Ballroom	*CHILDREN'S COMPREHENSION OF THE FUTURE*	63
Distel, Emma	1:30 PM Ballroom	*GREEN ROOF COST BENEFIT ANALYSIS*	103
D'Mello, Susan	9:30 AM Ballroom	*FACTORS INFLUENCING THE LIKELIHOOD OF OBSERVER INTERVENTION IN INCIDENTS OF WORKPLACE HARASSMENT OF EMPLOYEES WITH DISABILITIES*	47
Dobruse, Kathleen	1:30 PM Ballroom	*NEW DIGITAL DEVICES AND ACADEMIC WORK*	48
Dolan, Ella	9:30 AM Ballroom	*AREAS OF GEOGRAPHIC RACIAL EQUALITY BETWEEN HISPANICS AND NONHISPANIC WHITES IN TEXAS*	47

Student Name	Time/Room	*Project Title*	Page
Donnelly, Laura	3:00 PM Parlors ABC	*LATIN AMERICAN MUSIC FOR THE SAXOPHONE: UNCOVERING A REGION OF MUSIC*	48
Dover, John	9:30 AM Ballroom	*INVESTIGATING GENOME SIZE REDUCTION BY EXPERIMENTAL EVOLUTION WITH ESCHERICHIA COLI*	48
Dowdy, Greg	1:30 PM Ballroom	*NEW DIGITAL DEVICES AND ACADEMIC WORK*	48
Drake, Sarah	1:30 PM Ballroom	*IS NONDIET ONLINE INTERVENTION FOR WEIGHT MANAGEMENT IN COLLEGE STUDENTS EFFECTIVE*	49
Driscoll, Michael	1:30 PM Ballroom	*THE ROLE OF THE INSULIN SIGNALING PATHWAY IN ORGAN GROWTH AND SIZE REGULATION*	49
Dunning, Chelsey	10:00 AM Lake Erie Room	*EXAMINING URBAN TEACHER PREPARATION*	95
Duperon, Stephanie	11:45 AM Gold Room A	*EFFECT OF RBF PROTEIN TURNOVER ON ITS ACTIVITY*	49
Dworkin, Emily	9:30 AM Ballroom	*CHILDHOOD SEXUAL ABUSE AND DELIBERATE SELF HARM: PREDICTIVE RELATIONSHIPS AND MENTAL HEALTH OUTCOMES*	50
Edmonds, Jeffery	1:30 PM Ballroom	*EARLY MORNINGS, LATE AFTERNOONS*	50
Efevbera, Yvette	1:15 PM Tower Room	*ALLAH, ABC, AND HIV/AIDS: A COMPARATIVE ANALYSIS OF THE ROLE OF RELIGION IN UGANDA AND SENEGAL*	50
Egner, Alyse	9:30 AM Ballroom	*BIOGAS POTENTIAL SCREENING USING ANAEROBIC RESPIROMETRY*	50
Eibach, Laurel	9:30 AM Ballroom	*COMPARISON OF CARBONACEOUS CHONDRITE METEORITES TO RESULTS FROM THE STARDUST MISSION*	51
Elenbaas, Barbra	11:15 AM Lake Huron Room	*A SENSE OF PLACE*	39
Esfahanian, Mohammad	9:30 AM Ballroom	*ANALYSIS OF CARDIAC NOREPINEPHRINE (NE) TRANSPORTER (NET) MRNA AFTER REMOVAL OF THE STELLATE GANGLIA*	51
Etzcorn, Ryan	10:00 AM Gold Room B	*THE LAND OF SINIM: THE TAIPING REBELLION, CHINESE CIVIL WAR, AND THE THEOLOGICAL PENETRATION OF THE WEST*	51
Falandino, Adrienne Niku	9:30 AM Ballroom	*DIMINISHED MNSOD CONTRIBUTES TO ENDOTHELIAL PROGENITOR CELL DYSFUNCTION, IMPAIRED ANGIOGENESIS AND WOUND HEALING IN TYPE 2 DIABETES*	52
Fasseel, Danielle	1:30 PM Ballroom	*GENETIC MAPPING OF A GENE THAT REPRESSES FLOWERING*	52
Feldpausch, Maria A	10:15 AM Lake Erie Room	*PHYSICAL ACTIVITY FOR PERSONS WITH AUTISM: PARTICIPANT PERSPECTIVES*	52

Student Name	Time/Room	*Project Title*	Page
Ferrari, Dana	1:30 PM Ballroom	*FUNCTIONAL ANATOMY OF READING STORIES VERSUS SOLVING MATH PROBLEMS USING FMRI*	53
Ferry, Danielle	11:15 AM Gold Room B	*HUMAN RIGHTS IN THE THIRD WORLD: THE COMMONWEALTH AND LA FRANCOPHONIE*	53
Fletcher, Kathryn	10:00 AM Gold Room A	*THE ROLE OF HREV7 IN HUMAN MUTAGENESIS*	53
Fohlbrook, Courtney	1:30 PM Ballroom	*CREATING A WEB BASED TUTORIAL FOR COMMUNITY HEALTH WORKERS*	95
Fort, Christopher	1:30 PM Ballroom	*OPINION AND FOREIGN AFFAIRS KNOWLEDGE*	54
Foth, Patrick	2:00 PM Lake Superior Room	*CHARACTERIZING AMINO ACID TRANSPORT ACROSS THE EQUINE GASTROINTESTINAL TRACT*	54
Fraser, Bruce	9:30 AM Ballroom	*A FUSION PROTEIN OF MALTOSE BINDING PROTEIN AND URED, AN ACCESSORY PROTEIN INVOLVED IN UREASE ACTIVATION*	54
Friederichs, Robert	9:30 AM Ballroom	*BIOCOMPATIBILITY OF AMORPHOUS DIAMOND LIKE CARBON COATED TI AND COCRMO IMPLANTS*	54
Friederichs, Katelin	11:00 AM Lake Huron Room	*ETHICAL ISSUES IN UMBILICAL CORD BLOOD COLLECTION*	85
Friedgen, Shannon	1:30 PM Ballroom	*IDENTIFYING BARRIERS AND IMPROVING NUTRITION SCREENING AND COUNSELING IN CHILDRENS WELL CHILD VISITS*	55
Fujii, Sayako	2:30 PM Lake Huron Room	*THE DIFFERENCES BETWEEN MUSICIANS AND NON-MUSICIANS IN LISTENING TO MUSIC*	55
Fulgoni, Kristin	9:30 AM Parlors ABC	*ART TRANSFORMATION*	65
Gaddy, Gregg	11:30 AM Parlors ABC	*LIGHT MUSIC*	55
Garcia, Cory	9:45 AM Lake Superior Room	*BRIEF: THE STORY OF BLOODBOIL*	56
Garcia, Cory	10:00 AM Lake Superior Room	*EL SEEDO DARKO*	56
Gaynor, Mark	9:30 AM Ballroom	*EXPRESSION AND PURIFICATION OF PSEUDOMONAS SYRINGAE HOLPTOY*	56
Geist, Frank	10:15 AM Lake Superior Room	*GOTH-AM CITY 2*	56

Student Name	Time/Room	*Project Title*	Page
Geist, Frank	9:45 AM Lake Superior Room	*BRIEF: THE STORY OF BLOODBOIL*	56
Gessner, Amelia	9:30 AM Ballroom	*GEOGRAPHIC RACIAL EQUALITY BETWEEN WHITES AND ASIANS IN METROPOLITAN DETROIT*	56
Giles, Lizabeth	1:30 PM Ballroom	*COMMUNITY BASED RESEARCH FOR MEDICALLY UNDERSERVED WOMEN*	65
Gillen, Carolyn	9:45 AM Green Room	*USE OF EDGE HABITAT FOR FORAGING BY NORTHERN GOSHAWKS*	56
Gillengerten, Rachele	1:30 PM Ballroom	*IDENTIFYING BARRIERS AND IMPROVING NUTRITION SCREENING AND COUNSELING IN CHILDRENS WELL CHILD VISITS*	55
Gillon, Jaimee	9:30 AM Lake Erie Room	*STUDY OF ENGLISH LANGUAGE LEARNERS WITHIN A MAINSTREAM SECONDARY CLASSROOM*	57
Gipson, Kevin	9:30 AM Ballroom	*INTRAMOLECULAR ASYMMETRIC HYDROAMINATION OF AMINOALKENES*	57
Glaspie, Calvin	1:30 PM Ballroom	*DEVELOPMENT OF AN EARLY GENERATION TEST FOR COMMON SCAB OF POTATO USING HYDROPONIC NUTRIENT FILM TECHNOLOGY*	57
Glinke, Lauren	9:30 AM Parlors ABC	*ART TRANSFORMATION*	65
Goldman, Nicole	1:30 PM Ballroom	*TEXTURAL ANALYSIS OF COOKIES WITH INCREASING PERCENTAGES OF CRANBERRY BEAN FLOUR*	57
Gonzales, Katherine	1:30 PM Ballroom	*THE ROLE OF TLR4 IN OZONE-INDUCED LUNG INFLAMMATION*	58
Goodall, Megan	11:00 AM Gold Room A	*EVALUATION OF GENE EXPRESSION IN INDUCTION OF ADIPOGENESIS: COMPARISON OF ADIPOGENESIS IN HUMAN AND CANINE MESENCHYMAL STEM CELLS*	58
Goueli, Ramy	1:30 PM Ballroom	*THE ROLE OF THE SMALL GTPASE, CDC 42, IN THE ACTIVATION OF MIXED LINEAGE KINASE 3 THROUGH ITS INTERACTION WITH THE CDC42/RAC INTERACTIVE BINDING MOTIF*	58
Grady, Keara	9:30 AM Ballroom	*INVESTIGATING POSSIBLE MOLECULAR MECHANISMS FOR THE REGULATION OF ANGII AND ITS ROLE IN IDIOPATHIC PULMONARY FIBROSIS*	59
Graham, Nathan	12:00 PM Parlors ABC	*MAGIC VIA MOTION TRACKING: A PROJECT FOR THE CHICAGO HISTORY MUSEUM*	59
Greenberg, Sarah	1:30 PM Ballroom	*THE EFFECTS OF EMOTICONS ON INTERPERSONAL EVALUATIONS OF THEIR USERS*	36
Grindem, David	1:30 PM Ballroom	*PURIFICATION AND CRYSTALLIZATION OF THE NEISSERIA GONORRHEAE PROTEIN NG1684*	59

Student Name	Time/Room	*Project Title*	Page
Gruber, Amy	1:30 PM Ballroom	*GENE HUNTING TO LOCATE GENETIC MUTATIONS LEADING TO CANINE PROGRESSIVE RETINAL ATROPHY*	60
Grushky, Alex	1:30 PM Ballroom	*HOW THE HUMAN EYE PROTEINS PHYSIOLOGICALY DIFFERENTIATE DIFFERENT WAVELENGTHS OF LIGHT*	76
Guidot, Colleen	1:30 PM Ballroom	*IMPACT OF EQUINE NUTRITION PRACTICES ON THE ENVIRONMENT AND ECONOMICS*	34
Gunther, Brittany	1:30 PM Ballroom	*EVOLUTION OF INVASIVE SPECIES IN THE GREAT LAKES*	60
Haan, Kyle	12:00 PM Lake Superior Room	*WE'RE IN THIS TOGETHER*	60
Habitz, Danielle	1:30 PM Ballroom	*THE EFFECTS PACKAGING AND STORAGE LIFE HAVE ON THE ANTIOXIDANT CAPACITY OF MICHIGAN GROWN ASPARAGUS*	60
Hahn, Elyse	1:30 PM Ballroom	*CREATING A WEB BASED TUTORIAL FOR COMMUNITY HEALTH WORKERS*	95
Hatter, Lindsay	1:30 PM Ballroom	*IMPACTS OF BOTTLED WATER USE BY STUDENTS ON THE MICHIGAN STATE UNIVERSITY CAMPUS AND PROMOTION OF AVAILABLE ALTERNATIVES*	106
Hawes, Sara	9:30 AM Ballroom	*LADYBUGS*	61
Hayes, Lauren	9:30 AM Ballroom	*GEOGRAPHIC RACIAL EQUALITY IN KENTUCKY*	61
Hegarty, Britt	11:00 AM Lake Huron Room	*ETHICAL ISSUES IN UMBILICAL CORD BLOOD COLLECTION*	85
Heinhuis, Ryan	3:00 PM Tower Room	*ORGAN DONATION: A COMPARATIVE STUDY*	90
Heiss, Evan	11:00 AM Lake Superior Room	*SIDESHOW*	61
Heiss, Evan	11:30 AM Lake Superior Room	*ARTS OR CRAFTS*	61
Henderson, Aisha	1:30 PM Ballroom	*COMMUNITY HEALTH WORKERS IMPACT ON CANCER EDUCATION*	47
Henderson, Alex	10:00 AM Parlor A	*STEEL: HOT METAL, COLD REALITY*	86
Hendricks, Amy	1:30 PM Lake Superior	*ANALYSIS OF THE EFFECTS OF SUBSTITUTION OF SORGHUM AND CASSAVA IN BREAD PRODUCTION*	61

Student Name	Time/Room	*Project Title*	Page
Hendricks, Ryan	9:30 AM Ballroom	*TIME-RESOLVED PHOSPHORESCENCE DETECTION OF PROTEIN DYNAMICS*	62
Hessenauer, Jan-Michael	2:30 PM Green Room	*NON-LETHAL SAMPLING: CAN FISH FIN TISSUE PROVIDE RELIABLE STABLE ISOTOPE DATA*	62
Higginbotham, Aubrey	2:30 PM Lake Superior Room	*RAPID DETECTION OF E COLI IN RECREATIONAL WATERS*	40
Hill, Alex B.	1:30 PM Ballroom	*CHEVRON'S TRIPARTITE RELATIONSHIP WITH NIGERIA'S FEDERAL STAKEHOLDERS*	62
Hillman, Michele	1:30 PM Ballroom	*OPINION AND FOREIGN AFFAIRS KNOWLEDGE*	54
Hodder, Rachael	1:00 PM Lake Huron Room	*LIVIN THE MACLIFE: A STUDY IN REBRANDING*	63
Hollenbeck, Marie	9:30 AM Ballroom	*CHILDREN'S COMPREHENSION OF THE FUTURE*	63
Holoweiko, Simon	1:30 PM Parlors ABC	*FRESHMAN BRASS QUINTET*	116
Holycross, Jeffrey	2:00 PM Gold Room B	*THE ECONOMICS OF TICKET SCALPING*	63
Honer, Christine	1:30 PM Ballroom	*META-ANALYSIS OF HUMAN-COMPUTER INTERACTION RESEARCH*	82
Honer, Christine	1:30 PM Ballroom	*CAN PERCEPTIONS LEAD TO PURCHASE*	63
House, Chelsea	9:30 AM Ballroom	*A STITCH AHEAD: EXAMINING THE PROPERTIES OF ETHICON, INC. SUTURES USING SCANNING ELECTRON MICROSCOPY*	64
Howell, Darya	2:00 PM Gold Room A	*INVERSION AND HYDROGEN EXCHANGE IN 1,2-CYCLOPENTANEDIOLS: A GEOMETRICALLY CONSTRAINED MODEL FOR AQUEOUSPHASE GREEN CATALYTIC CARBOHYDRATE HYDROGENOLYSIS*	64
Hsieh, Mark	1:00 PM Parlors ABC	*MEDITATION*	64
Hsieh, Mark	1:30 PM Parlors ABC	*FRESHMAN BRASS QUINTET*	116
Huber, Andy	9:30 AM Parlors ABC	*ART TRANSFORMATION*	65
Hughes, Rebecca	9:30 AM Lake Superior Room	*INTERVIEWS WITH INFORMATION GRAPHICS LEGENDS*	64

Student Name	Time/Room	*Project Title*	Page
Hull, Matthew	1:30 PM Ballroom	*THE INTEGRATION OF NATURE INTO DESIGN*	65
Hung, No-Ya	1:30 PM Ballroom	*THE IMPACT OF 1-METHYLCYCLOPROPENE (1-MCP) ON ETHYLENE INVOLVED GENE EXPRESSION IN APPLE*	65
Hunt, Jeromy	9:30 AM Parlors ABC	*ART TRANSFORMATION*	65
Hunter, Michael	1:30 PM Lake Erie Room	*PERSONALITY AND SLINKIES*	65
Ish-Hurwitz, Netali	1:30 PM Ballroom	*COMMUNITY BASED RESEARCH FOR MEDICALLY UNDERSERVED WOMEN*	65
Jaskot, Becca	1:30 PM Ballroom	*ENERGY CONSUMPTION IN RESIDENCE HALLS*	84
Jeffery, Michael	1:30 PM Ballroom	*ROCKETBALL*	91
Jelinek, Andrew	2:15 PM Tower Room	*PERSONAL DEMOGRAPHICS IN RELATION TO INTERNATIONAL AFFAIRS KNOWLEDGE*	69
Jendrusina, Alex	12:00 PM Lake Erie Room	*COMPARING BRAIN ACTIVATION BETWEEN READING STORIES AND SOLVING MATH PROBLEMS USING FMRI*	91
Johnson, Michael	11:30 AM Lake Erie Room	*CAN BRAIN FUNCTIONAL MRI MEASURE CENTRAL DRIVE DURING MUSCLE CONTRACTIONS*	29
Johnson, Anna	1:30 PM Ballroom	*CREATING A WEB BASED TUTORIAL FOR COMMUNITY HEALTH WORKERS*	95
Jonasson, Erik	1:30 PM Tower Room	*RECYCLING IN MICHIGAN*	94
Jordan, Michael	10:15 AM Parlor A	*BEING ARAB AMERICAN SINCE 911*	66
Jurkovich, Ashley	9:30 AM Ballroom	*FACEBOOK @ MSU: FACULTY USAGE AND ATTITUDES*	111
Kamish, Rachel	9:30 AM Ballroom	*COMPOSITION OF SEASHELLS*	66
Kapplinger, Karla	1:30 PM Ballroom	*STUDY OF HOUSEHOLD PLANT LEAF STRUCTURE USING SCANNING ELECTRON MICROSCOPY*	66
Kaufmann, Timothy	9:45 AM Gold Room B	*SOFTWARE PATENTABILITY AND THE EVOLUTION OF PATENT LAW*	66
Kaye, Sarah	10:00 AM Lake Huron Room	*THE TRANSMISSION OF REGIONAL VOCABULARY ACROSS GENERATIONS IN SOUTHEASTERN FRANCE*	66

Student Name	Time/Room	*Project Title*	Page
Keedle, Amanda	9:30 AM Ballroom	*SEA SHELL STRUCTURE AND ELEMENTAL COMPOSITION*	67
Kim, Chong	1:30 PM Ballroom	*SCORING FUNCTION: ASSESSMENT MEASURE FOR PROTEIN-PROTEIN DOCKING*	67
Kinsler, Johanna	1:30 PM Ballroom	*IMPACTS OF BOTTLED WATER USE BY STUDENTS ON THE MICHIGAN STATE UNIVERSITY CAMPUS AND PROMOTION OF AVAILABLE ALTERNATIVES*	106
Klavon, Rachel	3:00 PM Gold Room A	*MATHEMATICAL STRATEGIES FOR TWOPERSON COMBINATORIAL GAMES*	35
Klimyte, Edita	9:30 AM Ballroom	*MOLECULAR SYSTEMATICS OF THE BUTTERFLY GENUS SPEYERIA*	67
Kline, Douglas	9:30 AM Ballroom	*CHARACTERIZATION OF THRESHOLD DEPENDENT ACTIVATION OF B LYMPHOCYTES BY LIPOPOLYSACCHARIDE AND ITS ROLE IN IMPAIRMENT OF THE IGM RESPONSE BY 2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN*	68
Knasel, Christine	1:30 PM Ballroom	*THE EFFECTS OF EMOTICONS ON INTERPERSONAL EVALUATIONS OF THEIR USERS*	36
Knight, Vanessa	1:30 PM Green Room	*IMPACT OF EQUINE NUTRITION PRACTICES ON ENVIRONMENT*	68
Kondrat, Carl	11:15 AM Lake Superior Room	*KEEPING THE FUTURE BRIGHT: THE GREAT LAKES REGION*	68
Korolowicz, Kyle	9:30 AM Ballroom	*ANALYSIS OF ARABIDOPSIS THALIANA NUCLEOTIDESUGAR NETWORKS, IMPLICATIONS IN CELL WALL BIOSYNTHESIS AND REGULATION*	69
Kostesich, Christine	1:30 PM Ballroom	*AFFECT OF PROTEIN ON AMMONIA EMISSIONS IN VITRO*	93
Kostesich, Christine	1:00 PM Lake Superior Room	*DETERMINING THE AMMONIA EMISSION RATE OF EQUIDS DUE TO FEED PROTEIN CONTENT*	78
Kovacek, Laura	1:30 PM Ballroom	*CUTTING RED TAPE OR PLAYING FAVORITES A COMPARISON OF BUSINESS DEVELOPMENT PNESTOP SHOPS IN THE GREAT LAKES ECONOMIC REGION*	32
Krcmarik, Kelly	11:00 AM Lake Huron Room	*ETHICAL ISSUES IN UMBILICAL CORD BLOOD COLLECTION*	85
Krebs, Kara	2:15 PM Tower Room	*PERSONAL DEMOGRAPHICS IN RELATION TO INTERNATIONAL AFFAIRS KNOWLEDGE*	69
Krieger, Andrew	1:30 PM Ballroom	*A COLLABORATIVE MODELING APPROACH FOR COMPLEX BUFFERS AND THEIR PROPERTIES*	69

Student Name	Time/Room	*Project Title*	Page
Krugler, Julie	1:30 PM Gold Room A	*BERYLLIUM ABUNDANCES IN SOLAR MASS STARS*	69
Kumar, Srikanth	9:30 AM Ballroom	*FIRE PROBLEM IN THE UNITED STATES*	70
Kupershtok, Mania	1:30 PM Ballroom	*THE ROLE OF THE INSULIN SIGNALING PATHWAY IN ORGAN GROWTH AND SIZE REGULATION*	49
Labedz, Debbie	9:30 AM Lake Huron	*CASE STUDIES IN GLOBALIZATION: THE LIVES AND WORK OF MONA HATOUM AND YINKA SHONIBARE*	70
LaForge, Jeffrey	9:30 AM Ballroom	*THERMAL FOOT*	70
Lagrou, Adrienne	2:15 PM Lake Superior Room	*VISUALIZING THE CHANGING FOOD SYSTEM*	71
Lang, Jessica	10:45 AM Lake Erie Room	*ROLES OF GRAPHICAL LITERACY IN STRUGGLING READERS' WRITING*	71
Lanweremeyer-Katharios, Stefan	3:00 PM Gold Room B	*THE G8 PROTESTS: IDEOLOGY, TACTICS AND STRUCTURE IN ACTION*	71
LaPlante, Carolyn	1:30 PM Ballroom	*STUDENT GENERATED PROTECTIVE BEHAVIORS TO AVERT SEVERE HARMS CAUSED BY ALCOHOL CONSUMPTION*	72
Lapp, Jacqueline	9:30 AM Ballroom	*THE ROLE OF JUMONJIC DOMAIN CONTAINING PROTEINS IN TRANSCRIPTION AND CHROMATIN MODIFICATION*	72
Larson, Britt	1:00 PM Green Room	*THE RELATIONSHIP BETWEEN REIN TENSION AND NATURAL OSCILLATIONS OF THE HEAD AND NECK IN THE TROTTING HORSE*	72
Lawless, Nicole	1:00 PM Lake Erie Room	*PERSONALITY AND DECISION MAKING (SENIOR HONORS THESIS)*	72
Lee, Debrah	9:30 AM Ballroom	*GOVERNMENT RECEPTIVENESS TO DEMANDS FOR SANITATION IN RURAL BANGLADESH*	73
Lee, Kristen	9:30 AM Parlor A	*THE RACIALIZATION OF HAWAII NATIVE SENATOR BARACK OBAMA IN STATE AND NATIONAL MEDIA: A CROSS MEDIA ANALYSIS*	73
Lee, Jun-seok	1:30 PM Ballroom	*REGULATION OF 4403 PROMOTER IN MYXOCOCCUS XANTHS*	73
Lee, Lawrence	1:30 PM Ballroom	*GENOTYPING ANALYSIS OF TPH2 AND DDC SNPS IN DOG BREEDS EXHIBITING A VARIETY OF BEHAVIORS*	74
Levere, Alicia	1:30 PM Ballroom	*THE EFFECT OF DEMOGRAPHICS AND ACADEMIC BACKGROUND ON KNOWLEDGE OF INTERNATIONAL AFFAIRS*	87
Lewis, Karren	10:30 AM Gold Room A	*POSSIBLE INVOLVEMENT OF SERUM AMYLOID A IN BREAST CANCER*	74

Student Name	Time/Room	*Project Title*	Page
Liddell, Lauren	9:30 AM Ballroom	*COMPLEMENTATION OF CJ1419C IN CAMPYLOBACTER JEJUNI NCTC 11168*	74
Lindsey, Alexander	1:30 PM Ballroom	*EFFECT OF SOIL TYPE ON ROOT DEVELOPMENT OF PINUS PONDEROSA VAR SCOPULORUM UNDER DROUGHT CONDITIONS*	75
Lippner, Dennean	9:30 AM Gold Room A	*UNDERSTANDING THE LINK BETWEEN CELL DEATH AND DIABETIC BONE LOSS*	75
Lorenz, Amanda	1:30 PM Ballroom	*INTERACTIONS OCCUR BETWEEN AUTOCHTHONOUS AND ALLOCHTHONOUS PROCESSES IN A HEADWATER STREAM*	75
Lowry, Jessica	9:30 AM Ballroom	*INNOCENT BYSTANDERS*	108
Ludy, Roger	11:00 AM Tower Room	*MICHIGAN WASTE MANAGEMENT*	76
Luethy, Paul	1:30 PM Ballroom	*ENGINEERING A CYSTEINE-LESS SPOIVFB*	76
Lundin, Michael	1:30 PM Ballroom	*HOW THE HUMAN EYE PROTEINS PHYSIOLOGICALY DIFFERENTIATE DIFFERENT WAVELENGTHS OF LIGHT*	76
Mackaluso, Joshua	1:30 PM Ballroom	*ANALYZING THE EVOLUTIONARY RATES OF INTRACELLULAR AND EXTRACELLULAR PROTEINS*	76
Martinez, William	9:30 AM Ballroom	*ELECTRIC PROPERTIES OF GRAPHENE*	77
Mayer, Alex	1:30 PM Ballroom	*STUDENT GENERATED PROTECTIVE BEHAVIORS TO AVERT SEVERE HARMS CAUSED BY ALCOHOL CONSUMPTION*	71
Mayle, Ryan	1:30 PM Ballroom	*CHLOROPLAST DNA MUTATIONS AS A GENETIC INDICATOR OF OXIDATIVE DAMAGE IN CHLAMYDOMONAS REINHARDTII*	77
Maynard, Victoria	2:15 PM Tower Room	*PERSONAL DEMOGRAPHICS IN RELATION TO INTERNATIONAL AFFAIRS KNOWLEDGE*	69
Mays, Kyle	9:30 AM Gold Room B	*THE BLACK MIDDLE CLASS: A REINFORCEMENT OF WHITE VALUES, WHITE RACISM, AND WHITE CULTURE*	77
Mazor, Kevin	1:00 PM Lake Superior Room	*DETERMINING THE AMMONIA EMISSION RATE OF EQUIDS DUE TO FEED PROTEIN CONTENT*	78
Mazor, Kevin	1:30 PM Ballroom	*IMPACT OF EQUINE NUTRITION PRACTICES ON THE ENVIRONMENT AND ECONOMICS*	34
Mazzoni, Serina	11:15 AM Gold Room A	*CHARACTERIZATION OF THE TELOMERE PROTEIN POT1B IN TETRAHYMENA*	78
McCarthy, Ashley	1:30 PM Ballroom	*PATTERN RECOGNITION AND DISCRIMINATION IN HORSES*	78

Student Name	Time/Room	*Project Title*	Page
McClowry, Robert	1:30 PM Ballroom	*CAN BRAIN FUNCTIONAL MRI MEASURE CENTRAL DRIVE DURING MUSCLE CONTRACTIONS*	34
McCoy, Victoria	9:30 AM Ballroom	*A NEW ICHNOSPECIES OF ARTHROPHYCUS FROM THE LATE CARBONIFEROUS (PENNSYLVANIAN) OF MICHIGAN, USA*	79
McCue, Erin	9:30 AM Ballroom	*LEAD SARCOPHAGUS*	79
Mccullough, Christine	11:00 AM Parlors ABC	*EMBODYING SOCIAL ADVOCACY*	81
McGorey, Mary	11:00 AM Parlors ABC	*EMBODYING SOCIAL ADVOCACY*	81
McLaughlin, Mike	11:30 AM Lake Superior	*ARTS OR CRAFTS*	61
McLean, Casey	1:30 PM Ballroom	*COMMUNITY HEALTH WORKERS IMPACT ON CANCER EDUCATION*	47
McNally, Megan	9:30 AM Ballroom	*HISTORIC INTERIORS OF MICHIGAN STATE UNIVERSITY BUILDINGS*	79
Mehta, Krish	9:30 AM Ballroom	*ALTERNATIVE MEDICINE AND AMERICAN DOCTORS*	79
Mendoza, Michael	9:30 AM Ballroom	*DISTRIBUTION OF RUST IN CARBONACEOUS CHONDRITE, AND IMPLICATIONS FOR DIFFERENTIAL PERMEABILITY OF MATRIX, RIM AND CLAST MATERIALS ON THE CM CHONDRITE PARENT BODY*	80
Merlo, Jared	11:15 AM Tower Room	*ENTREPRENEURS AND THE INSIGHTS THEY PROVIDE*	80
Merony, Kristin	1:00 PM Lake Superior Room	*DETERMINING THE AMMONIA EMISSION RATE OF EQUIDS DUE TO FEED PROTEIN CONTENT*	78
Micinski, Nicholas	2:45 PM Gold Room B	*CIVIL SOCIETY ORGANIZATIONS IN MUSLIM MINORITY COMMUNITIES: A COMPARISON*	80
Miller, Hanna	9:30 AM Ballroom	*SYNTHESIS AND EVALUATION OF ELECTRICALLY ACTIVE MAGNETIC NANO AND MICRO PARTICLES FOR BIOSENSING OF BOVINE VIRAL DIARRHEA VIRUS*	80
Mills, Stephanie	10:45 AM Tower Room	*THE STRUGGLE TO DEVELOP AND PRESERVE THE DUALITY OF STUDENT-ATHLETES*	81
Minella, Andrea	1:15 PM Green Room	*IMPACT OF HAY PROTEIN QUALITY ON NITROGEN EXCRETION RATES IN THE MATURE HORSE*	81
Mitchell, Erik	9:30 AM Ballroom	*INNOCENT BYSTANDERS*	108
Mitchell, Samantha	11:00 AM Parlors ABC	*EMBODYING SOCIAL ADVOCACY*	81

Student Name	Time/Room	*Project Title*	Page
Moran, Michael	9:30 AM Ballroom	*DEPLETION OF SULFUR WITHIN STARDUST SAMPLES AND ITS IMPLICATIONS ON UNDERSTANDING EXTRATERRESTRIAL BODIES*	82
Morgan, Meredith	1:30 PM Ballroom	*PRODUCT TYPE AND ONLINE INITIAL TRUST ANTECEDENTS*	82
Morgan, Meredith	1:30 PM Ballroom	*META-ANALYSIS OF HUMAN-COMPUTER INTERACTION RESEARCH*	82
Morra, Todd	2:45 PM Gold Room A	*FRACTAL IMAGES AND ITERATED FUNCTION SYSTEMS*	42
Morris, Benjamin	11:00 AM Lake Huron	*ETHICAL ISSUES IN UMBILICAL CORD BLOOD COLLECTION*	85
Mousa, Shimaa	1:30 PM Ballroom	*COMMUNITY HEALTH WORKERS IMPACT ON CANCER EDUCATION*	47
Mullen, Abbey	9:30 AM Ballroom	*THE EFFECTS OF CHITINASE AND CATHEPSON ON MEMBRANE PROTEIN PRODUCTION IN ACMNPV*	82
Mund, Brian	2:15 PM Lake Erie Room	*THE EFFECTS OF HYPOCRISY ON THE THREAT OF EXCLUSION IN SOCIAL DILEMMAS*	83
Murphy, Kaitlynn	9:30 AM Ballroom	*FACEBOOK @ MSU: STUDENT ATTITUDES AND USAGE*	114
Murray, Matthew	1:30 PM Ballroom	*THE BARBARY WAR: PERCEPTIONS OF MUSLIMS AND THE INTERNATIONAL SYSTEM*	83
Murray, Matthew	9:30 AM Ballroom	*JURY PREDELIBERATION DISCUSSION IN CIVIL TRIALS*	43
Myers, Daniel	1:30 PM Ballroom	*LAKE MODELING FOR CONSERVATION IN THE PERUVIAN AMAZON*	83
Nasser, Khalil	1:30 PM Ballroom	*SECOND LIFES INFLUENCE ON USER INTENTION FOR EGOVERNMENT SERVICES IN CONTRAST TO 2D WEBSITES*	83
Nasser, Khalil	1:30 PM Ballroom	*ENHANCE SHOPPING EXPERIENCE WITH PERSONALIZED GUIDED TOURS*	42
Nies, Matt	11:30 AM Lake Erie Room	*CAN BRAIN FUNCTIONAL MRI MEASURE CENTRAL DRIVE DURING MUSCLE CONTRACTIONS*	29
Novak, Michaelene	1:30 PM Ballroom	*COMMUNICATION IN THE APPAREL AND TEXTILE INDUSTRY*	83
Nowicki, Martha	1:30 PM Ballroom	*ENERGY CONSUMPTION IN RESIDENCE HALLS*	84
Obradovich, Diana	9:30 AM Ballroom	*RESEARCH ASSISTANT AND COORDINATOR FOR ARTS MARATHON WEEKEND*	84

Student Name	Time/Room	*Project Title*	Page
O'Connell, Kelly	9:30 AM Ballroom	*JURY PREDELIBERATION DISCUSSION IN CIVIL TRIALS*	43
Ogilvie, Michael	1:30 PM Ballroom	*NEW DIGITAL DEVICES AND ACADEMIC WORK*	48
O'Leary, Derek	1:30 PM Ballroom	*METAPHORS IN CREATIVITY*	84
Oliverio, Michael	1:30 PM Ballroom	*CAN BRAIN FUNCTIONAL MRI MEASURE CENTRAL DRIVE DURING MUSCLE CONTRACTIONS*	34
Olson, Nora	2:30 PM Parlors ABC	*SOPHOMORE BRASS QUINTET*	84
O'Neall, Mark	9:30 AM Ballroom	*LOOKING ON THE BRIGHT SIDE: WHERE IN METROPOLITAN DETROIT HAS A MINORITY GROUP REACHED GEOGRAPHIC RACIAL EQUALITY*	84
Orser, Janelle	11:00 AM Parlors ABC	*EMBODYING SOCIAL ADVOCACY*	81
Orsini, Joseph	10:15 AM Gold Room B	*PRIVATE INFORMATION AND AGENT EXPERIENCE IN NFL CONTRACT NEGOTIATIONS*	85
Owens, Kellie	11:00 AM Lake Huron Room	*ETHICAL ISSUES IN UMBILICAL CORD BLOOD COLLECTION*	85
Palasik, Dena	2:00 PM Gold Room A	*INVERSION AND HYDROGEN EXCHANGE IN 1,2CYCLOPENTANEDIOLS: A GEOMETRICALLY CONSTRAINED MODEL FOR AQUEOUSPHASE GREEN CATALYTIC CARBOHYDRATE HYDROGENOLYSIS*	64
Pandey, Priyanka	1:30 PM Ballroom	*EVALUATING HEIRLOOM TOMATO VARIETIES FOR THE PRESENCE OF THE GREEN FLESH MUTATION*	85
Para, Andrew	9:30 AM Ballroom	*DROSOPHILA MELANOGASTER*	85
Paranjpe, Varun	9:30 AM Ballroom	*YOUTH BULLYING: THE VICTIMIZATION*	93
Parmet, Benjamin	10:30 AM Gold Room B	*MARGINAL CONGRESS MEMBER SPONSORSHIP BEHAVIOR IN COMMITTEE POSTS*	86
Patel, Nirali	9:30 AM Ballroom	*FACEBOOK @ MSU: STUDENT ATTITUDES AND USAGE*	114
Pathak, Saumya	11:30 AM Lake Erie Room	*CAN BRAIN FUNCTIONAL MRI MEASURE CENTRAL DRIVE DURING MUSCLE CONTRACTIONS*	29
Payton, Ashley	9:30 AM Tower Room	*A META-ANALYTIC REVIEW OF THE ROLE OF FIRM STRATEGIC ORIENTATIONS ON FIRM PERFORMANCE*	86

Student Name	Time/Room	*Project Title*	Page
Peacock, Jacob	9:30 AM Ballroom	*HIGH SCHOOL BULLIES*	91
Pearce, Jade	9:30 AM Ballroom	*COLLEGE STUDENT VIEWPOINTS ON NATURAL AND ARTIFICIAL MATERIALS*	86
Peterka, Amanda	10:00 AM Parlor A	*STEEL: HOT METAL, COLD REALITY*	86
Petersen, Jon	1:30 PM Ballroom	*BEES AND THEIR EFFECT ON POLLINATION*	31
Peterson, Leif	1:30 PM Ballroom	*THE EFFECTS OF EMOTICONS ON INTERPERSONAL EVALUATIONS OF THEIR USERS*	36
Phelan, Kelly	1:30 PM Ballroom	*THE EFFECT OF DEMOGRAPHICS AND ACADEMIC BACKGROUND ON KNOWLEDGE OF INTERNATIONAL AFFAIRS*	87
Phillips, Kevin	1:30 PM Parlors ABC	*FRESHMAN BRASS QUINTET*	116
Phillips, Ben	1:30 PM Ballroom	*OPPORTUNITIES FOR ALTERNATIVE ENERGY EDUCATION IN MICHIGAN SCHOOLS K-12 COMPARED TO NATIONAL AND INTERNATIONAL STANDARDS*	87
Piskorowski, Mark	1:30 PM Lake Huron Room	*THE ATHENIAN EPHEBEIA IN PLATOS MENEXENUS*	87
Plum, Alexander	1:30 PM Ballroom	*MILITARY AUTHORITARIANISM: CONSTITUTIONAL DEMOCRACY IN THAILAND*	87
Poppe, Nicole	9:45 AM Tower Room	*CUSTOMER RELATIONSHIP MANAGEMENT SOFTWARE ANALYSIS*	88
Powers, Margaret	1:30 PM Ballroom	*SECOND LIFES INFLUENCE ON USER INTENTION FOR EGOVERNMENT SERVICES IN CONTRAST TO 2D WEBSITES*	42
Powers, Margaret	1:30 PM Ballroom	*THE MEDIATING ROLE OF TRUST ON THE CREDIBILITY OF ONLINE RETAILERS AND CONSUMERS PURCHASE INTENTIONS*	88
Priebe, Alex	11:30 AM Lake Superior Room	*ARTS OR CRAFTS*	61
Prout, Tiffany	12:15 PM Lake Erie Room	*VALIDITY OF THE OMNI RPE SCALE ACROSS A WIDE RANGE OF PHYSICAL ACTIVITIES*	88
Punch, Zach	1:30 PM Ballroom	*CAN BRAIN FUNCTIONAL MRI MEASURE CENTRAL DRIVE DURING MUSCLE CONTRACTIONS*	34
Rabidoux, Katherine	9:30 AM Ballroom	*PERIOD CHANGES OF TYPE II CEPHEID VARIABLE STARS: WATCHING STARS EVOLVE*	88
Ramus, Kristin	11:30 AM Lake Erie Room	*CAN BRAIN FUNCTIONAL MRI MEASURE CENTRAL DRIVE DURING MUSCLE CONTRACTIONS*	29

Student Name	Time/Room	*Project Title*	Page
Ranasinghe, Romali	9:30 AM Ballroom	*BIOSYNTHESIS OF GOLD NANOPARTICLES*	89
Rank, Katherine	9:30 AM Ballroom	*A CHEMICAL DERIVATIZATION AND MULTISTAGE TANDEM MASS SPECTROMETRY BASED STRATEGY FOR TARGETED PHOSPHOPROTEOME ANALYSIS*	89
Rankinen, Wil	9:45 AM Lake Huron Room	*AN UPPER PENINSULA OF MICHIGAN VOWEL SYSTEM*	89
Reddy, Haritha	3:00 PM Tower Room	*ORGAN DONATION: A COMPARATIVE STUDY*	90
Ribble, Allison	1:30 PM Ballroom	*AFFECTS OF LEVEL OF INVOLVEMENT IN 3-D ADVERTISING ON PURCHASE INTENTION*	90
Ribble, Allison	1:30 PM Ballroom	*SECOND LIFES INFLUENCE ON USER INTENTION FOR EGOVERNMENT SERVICES IN CONTRAST TO 2-D WEBSITES*	42
Riddell, Emily	9:30 AM Ballroom	*SEM-ANALYSIS OF DIFFERENT FIBERS AND FORENSIC APPLICATION*	90
Riedinger, Chris	12:00 PM Lake Erie Room	*COMPARING BRAIN ACTIVATION BETWEEN READING STORIES AND SOLVING MATH PROBLEMS USING FMRI*	91
Rinke, Samantha	9:30 AM Ballroom	*HIGH SCHOOL BULLIES*	91
Rivkina, Svetlana	11:45 AM Lake Superior Room	*MSUU*	91
Roman, Charles	1:30 PM Ballroom	*ROCKETBALL*	91
Rossmans, Sam	10:30 AM Lake Erie Room	*MISSING CONNECTIONS IN GLOBAL CHANGE*	91
Russell, Christina	9:30 AM Ballroom	*HOW DO PARENTS APPROACH QUANTITATIVE BOOKS WITH THEIR PRESCHOOLERS*	92
Ryerkerk, Brian	1:30 PM Ballroom	*GREEN ROOF COST BENEFIT ANALYSIS*	103
Rygiel, Valerie	9:30 AM Ballroom	*YOUTH BULLYING: THE VICTIMIZATION*	93
Sahm, Michelle	1:30 PM Ballroom	*CAN BRAIN FUNCTIONAL MRI MEASURE CENTRAL DRIVE DURING MUSCLE CONTRACTIONS*	34
Sanders, Nathan	2:45 PM Tower Room	*EXCAVATION OF HISTORIC MAC FACULTY ROW HOUSING COMPLEX*	92

Student Name	Time/Room	*Project Title*	Page
Sanders, Nathan	1:15 PM Gold Room A	*CHARACTERIZATION OF STARDUST DROPLET SIZE DISTRIBUTION*	92
Sandford, Bryan	1:30 PM Ballroom	*ROCKETBALL*	91
Savalli, Lisa	1:30 PM Ballroom	*THE ROLE OF RENEWABLE ENERGY ON COMMUNITY SELF RELIANCE*	92
Savel, Kelly	1:15 PM Gold Room B	*THE CHANGING FACE OF THE UNITED STATES BORDER PATROL*	93
Scheetz, Danielle	1:45 PM Green Room	*ANTI-MULLERIAN HORMONE IN HEIFERS WITH HIGH VERSUS LOW NUMBERS OF ANTRAL FOLLICLES GROWING DURING OVARIAN FOLLICULAR WAVES*	93
Scherer, Erin	9:30 AM Ballroom	*YOUTH BULLYING: THE VICTIMIZATION*	93
Scheuber, Kathleen	9:30 AM Ballroom	*HIGH SCHOOL BULLIES*	91
Scheuing, Elizabeth	1:30 PM Ballroom	*AFFECT OF PROTEIN ON AMMONIA EMISSIONS IN VITRO*	93
Schmidt, Mary	1:30 PM Ballroom	*FUNCTIONAL ANATOMY OF READING STORIES VERSUS SOLVING MATH PROBLEMS USING FMRI*	53
Schoenherr, Jessica	11:30 AM Gold Room B	*WE SHALL NOT SURRENDER: KENNEDY, THE BERLIN CRISIS, AND THE EFFECTIVE USE OF THE RHETORICAL PRESIDENCY*	94
Schroeder, Laura	9:30 AM Ballroom	*TERRESTRIAL WEATHERING OF EUCRITIC ACHONDRITIC METEORITES*	94
Seavoy, Erin	1:30 PM Tower Room	*RECYCLING IN MICHIGAN*	94
Sedlacek, Alycia	1:30 PM Ballroom	*CREATING A WEB BASED TUTORIAL FOR COMMUNITY HEALTH WORKERS*	95
Seese, Raymond	9:30 AM Ballroom	*IMPACT OF IFNG ON BONE LOSS IN DIABETIC MICE*	95
Seguin, Jeffrey	10:00 AM Lake Erie Room	*EXAMINING URBAN TEACHER PREPARATION*	95
Selbig, Shaina	1:30 PM Ballroom	*IMPACT OF EQUINE NUTRITION PRACTICES ON THE ENVIRONMENT AND ECONOMICS*	34
Semivan, James	10:45 AM Lake Superior Room	*W.A.S.T.E*	95
Shah, Jay	1:45 PM Gold Room A	*PREPARATION AND CHARACTERIZATION OF PELLETED CARBON ELECTRODES*	96

Student Name	Time/Room	*Project Title*	Page
Shan, Lei	9:30 AM Ballroom	*CMEIAS 1X BIOFILM RESEARCH*	96
Shaw, Jefrey	9:30 AM Ballroom	*INFORMED PARSING*	96
Short, Rachael	9:30 AM Ballroom	*MUSIC IN WORSHIP*	96
Siciliano, Anthony	11:00 AM Lake Superior Room	*SIDESHOW*	61
Sidge, Jennifer	1:30 PM Ballroom	*DO HENS HAVE A COLOR PREFERENCE FOR DUSTBATHING SUBSTRATE*	96
Slavin, Michelle	2:30 PM Lake Superior Room	*RAPID DETECTION OF E COLI IN RECREATIONAL WATERS*	40
Smith, Nicole	1:30 PM Ballroom	*THE EFFECT OF MARTINGALE REIN INSERTS ON HORSES BEHAVIOR*	97
Smith, Patricia	10:45 AM Lake Huron Room	*FOR THE LAST TIME, I'M NOT MEXICAN: MISCONCEPTIONS ABOUT HISPANIC AMERICANS*	97
Smith, Kelsey	9:30 AM Ballroom	*JURY PREDELIBERATION DISCUSSION IN CIVIL TRIALS*	43
Smith, Kevin	1:30 PM Parlors ABC	*FRESHMAN BRASS QUINTET*	116
Souvenir, Princess	2:00 PM Lake Huron Room	*THE TWO ARE REALLY ONE: THE SOCIAL AND POLITICAL IMPACT OF REGGAE AND HIP HOP MUSIC TO NEW WORLD AFRICANS*	97
Spencer, Ryan	1:30 PM Ballroom	*STRUCTURAL ANALYSIS OF THE INFLUENZA VIRAL FUSION PROTEIN*	98
Sprague, Kyle	9:30 AM Ballroom	*ADVANTAGES OF MIIPS FOR TWO-PHOTON MICROSCOPY WITH ULTRASHORT PULSES*	98
St. James, Elizabeth	1:15 PM Lake Superior Room	*THE EFFECTS OF WOODLOT SIZE AND HABITAT ON THE NUMBER OF BIRD SPECIES WITHIN THE WOODLOT*	98
Stanley, Sandte	2:00 PM Lake Erie Room	*AGE AND RACE DIFFERENCES AND THEIR RELATION TO THE UNDERSTANDING OF HEALTH ISSUES REGARDING CERVICAL CANCER*	99
Staron, Brett	1:30 PM Ballroom	*DEVELOPMENT AS EMPOWERMENT*	99

Student Name	Time/Room	*Project Title*	Page
Stavoe, Andrea	1:30 PM Ballroom	*GUN201 ENCODES A TPR PROTEIN OF UNKNOWN FUNCTION AND DEFINES A NEW PLASTIDTONUCLEUS SIGNALING PATHWAY*	99
Steffy, Lauren	2:15 PM Lake Huron Room	*THE EFFECT OF MUSICAL STYLE ON THE THRESHOLDS FOR PERCEIVING TEMPO MODULATION*	99
Strong, Benjamin	9:30 AM Ballroom	*DETECTION OF FISSION FRAGMENTS OF URANIUM*	100
Struck, Rebekah	9:30 AM Ballroom	*WEB-BASED SURVEYS*	100
Suarez de Urbina, Fernando	9:30 AM Ballroom	*EFFECTS OF STREPTOMYCIN IN THE MICROBIAL COMMUNITY*	100
Sullenger, Anjela	1:30 PM Ballroom	*THE EFFECTS OF RESIDENTIAL DEVELOPMENT ON LAKE FOOD WEB SYSTEMS*	100
Sullivan, Ryan	1:30 PM Ballroom	*CONSERVATION OF TRYPTOPHAN REPRESSOR:DNA OPERATOR COMPLEXES*	101
Sutton, Megan M.	9:30 AM Ballroom	*CHILDREN'S COMPREHENSION OF THE FUTURE*	63
Sutton, Megan E.	10:30 AM Lake Huron Room	*MEASURING IDENTIFICATION OF NATIVE-LIKE SPANISH PRONUNCIATION*	101
Sutton, Megan M.	9:30 AM Ballroom	*CHILDREN'S USE OF PROSODY TO DETERMINE SYNTACTIC STRUCTURE*	101
Swan, Jeffrey	10:15 AM Gold Room A	*PEROXISOMAL FBOX PROTEINS*	102
Swartz, Ashley	1:30 PM Ballroom	*RUNNING ECONOMY IN MEN AND WOMEN VARSITY BASKETBALL ATHLETES*	102
Swiderski, Katie	9:30 AM Ballroom	*GETTING INTERRUPTED: WHY SOME TYPES OF INTERRUPTIONS MAY BE MORE DISRUPTIVE THAN OTHERS*	102
Szutkowski, Tracy	10:45 AM Lake Erie Room	*ROLES OF GRAPHICAL LITERACY IN STRUGGLING READERS' WRITING*	71
Tagami, Tyler	9:45 AM Lake Superior Room	*BRIEF: THE STORY OF BLOODBOIL*	56
Tagami, Tyler	10:00 AM Lake Superior Room	*EL SEEDO DARKO*	56
Tans, Erin	10:45 AM Green Room	*A STUDY OF TRANSITIONS BETWEEN DIFFERENT GAITS IN DRESSAGE HORSES*	102

Student Name	Time/Room	*Project Title*	Page
Taubitz, Lauren	9:30 AM Ballroom	*PREDICTING PERSISTENCE OF ADHD: A MOLECULAR GENETIC STUDY*	103
Taunt, Allison	9:30 AM Ballroom	*GRAND RAPIDS: A STUDY OF GEOGRAPHIC RACIAL EQUALITY*	103
Taylor, Caitlin	1:30 PM Ballroom	*GREEN ROOF COST BENEFIT ANALYSIS*	103
Tepp, Gabrielle	9:30 AM Ballroom	*TIME SCALES OF AQUEOUS ALTERATION ON THE C2 CARBONACEOUS CHONDRITE PARENT BODY*	103
TerAvest, Michaela	1:30 PM Ballroom	*EFFECTS OF RCAE ON CELL MORPHOLOGY IN FREMYELLA DIPLOSIPHON*	104
Thelen, John	10:00 AM Tower Room	*RELATING THE BALANCED SCORECARD TO RESOURCE AND INDUSTRIAL THEORIES*	104
Thomas, Jason	1:30 PM Ballroom	*STRUCTURAL MODELS FOR THE ACTIVE SITE OF ACETYL COENZYME A SYNTHASE*	105
Thomas, Justin	9:30 AM Ballroom	*SYNTHESIS, STRUCTURE, AND MAGNETIC STUDIES OF TRIMETALLIC μ-TERT-BUTYLIMIDE COMPOUNDS*	105
Thomas, Danielle	9:30 AM Ballroom	*MOOD AND PERSON PERCEPTION: THE IMPORTANCE OF OBSERVER MOOD*	104
Thome, Elizabeth	1:30 PM Ballroom	*AFFECT OF PROTEIN ON AMMONIA EMISSIONS IN VITRO*	93
Timmerman, Anna	1:30 PM Ballroom	*DENSITY DEPENDENT GERMINATION RATES OF THREE SUMMER ANNUAL WEEDS*	105
Tindle, David	1:30 PM Ballroom	*IMPACTS OF BOTTLED WATER USE BY STUDENTS ON THE MICHIGAN STATE UNIVERSITY CAMPUS AND PROMOTION OF AVAILABLE ALTERNATIVES*	106
Towner, Suzanne	9:30 AM Ballroom	*HAIR: A COMPARATIVE ANALYSIS ON STRUCTURE AND FUNCTION*	106
Tucker, Taaja	1:30 PM Ballroom	*CAUSES OF INJURY TO BIRDS BROUGHT TO A SOUTHEASTERN MICHIGAN REHABILITATION CENTER*	106
Tung, Grace	9:30 AM Ballroom	*TRICHOTHECENE MYCOTOXINS AND THE RIBOTOXIC STRESS RESPONSE*	107
Turcotte, Mary	2:00 PM Parlors ABC	*PIANO STUDY AS RESEARCH OF SELF*	107
Turner, Tychele	12:00 PM Gold Room A	*IDENTIFICATION AND ANALYSIS OF GAMMA AND BETA ACTIN PROTEIN INTERACTIONS WITHIN THE INNER EAR THROUGH THE USE OF A YEAST TWO HYBRID*	107
Twigg, David	9:30 AM Parlors ABC	*ART TRANSFORMATION*	65

Student Name	Time/Room	*Project Title*	Page
Twiss, Beverly	9:30 AM Ballroom	*COMPENSATORY EVOLUTION*	108
Valentine, Andrew	9:30 AM Ballroom	*ASSESSING CHILDREN'S PRODUCTIVE USE OF WILL AND GONNA*	108
Valentine, Jessica	1:30 PM Ballroom	*THE EFFECTS OF EMOTICONS ON INTERPERSONAL EVALUATIONS OF THEIR USERS*	36
Valentine, Andrew	9:30 AM Ballroom	*CHILDREN'S USE OF PROSODY TO DETERMINE SYNTACTIC STRUCTURE*	101
Vallosia, Kayla	9:30 AM Ballroom	*INNOCENT BYSTANDERS*	108
Vanderkolk, Valerie	9:30 AM Ballroom	*DISCOVERING A GARMENTS HISTORY*	108
VanEgmond, Andrew	9:45 AM Lake Erie Room	*VIRTUAL HISTORY MUSEUM*	109
VanSickle, Megan	1:30 PM Ballroom	*DEVELOPMENT OF CANINE SINE INSERTION POLYMORPHIC MARKERS FOR A GENOME SCAN FOR THE CRANIOMANDIBULAR OSTEOPATHY (CMO) DISEASE GENE*	109
Varga, Ashley	2:30 PM Lake Superior Room	*RAPID DETECTION OF E COLI IN RECREATIONAL WATERS*	40
Varnes, Blaire	10:45 AM Gold Room A	*CHANGES IN MYOBLAST ACTIVITY DURING PIG DEVELOPMENT ARE NOT EXPLAINED BY INHERENT DIFFERENCES IN PHENOTYPE OR GLOBAL GENE EXPRESSION PATTERNS*	109
Vasilenko, Christin	1:30 PM Ballroom	*USING DRAMA FOR LITERACY TEACHING IN URBAN SCHOOLS*	109
Vear, Amara	1:30 PM Ballroom	*THE EFFECTS OF EMOTICONS ON INTERPERSONAL EVALUATIONS OF THEIR USERS*	36
Veldheer, Daniel	1:30 PM Ballroom	*CAN BRAIN FUNCTIONAL MRI MEASURE CENTRAL DRIVE DURING MUSCLE CONTRACTIONS*	34
Vermette, Melissa	9:30 AM Ballroom	*INNOCENT BYSTANDERS*	108
Vong, Syhming	10:00 AM Parlors ABC	*UNTITLED*	110
Wagner, Adam	1:30 PM Gold Room B	*COURTING DISASTER: STATE-BUILDING IN AFGHANISTAN*	110
Walker, Shalane	9:45 AM Parlor A	*COVERAGE OF MENTAL ILLNESS IN AFRICAN-AMERICAN MAGAZINES*	110

Student Name	Time/Room	*Project Title*	Page
Warnshuis, Jessica	1:30 PM Ballroom	*AN ANALYSIS OF HEALTH COMMUNICATION RESEARCH: IS HEARING LOSS ACCOUNTED FOR?*	110
Watkins, Courtney	1:30 PM Ballroom	*IDENTIFYING BARRIERS AND IMPROVING NUTRITION SCREENING AND COUNSELING IN CHILDRENS WELL CHILD VISITS*	55
Wechsler, Amy	9:30 AM Ballroom	*A DECISION-MAKING ALGORITHM FOR MOSQUITO BLOOD MEAL IDENTIFICATION USING PCR AMPLIFICATION OF THE VERTEBRATE CYTOCHROME B GENE*	111
Weiss, Kayla	1:30 PM Ballroom	*THE PALATABILITY OF FISH OIL FOR HORSES*	111
Wendling, Nicholas	9:30 AM Ballroom	*FACEBOOK @ MSU: FACULTY USAGE AND ATTITUDES*	111
Westerhof, Trisha	9:30 AM Ballroom	*MOLECULAR EVIDENCE FOR POSITIVE SELECTION OF THE ANTIFIV GENE APOBEC3C IN CAT SPECIES: A MODEL FOR UNDERSTANDING HOST VS PATHOGEN ARMS RACE OF HUMANS WITH HIV*	111
Westrick, Daniel	1:30 PM Ballroom	*THE EFFECTS OF EMOTICONS ON INTERPERSONAL EVALUATIONS OF THEIR USERS*	36
Whalen, Adair	1:30 PM Ballroom	*THE EFFECT OF DEMOGRAPHICS AND ACADEMIC BACKGROUND ON KNOWLEDGE OF INTERNATIONAL AFFAIRS*	87
Wiederoder, Michael	9:30 AM Ballroom	*STUDY OF ELECTROSPUN NANOFIBERS FOR USE IN A CONDUCTOMETRIC BIOSENSOR*	112
Wiedmaier, Benjamin	1:30 PM Ballroom	*THE INFLUENCE OF MYSPACE AND FACEBOOK EVENTS ON INTERPERSONAL RELATIONSHIPS*	112
Wildbill, Andrew	10:15 AM Green Room	*CHARACTERIZATION OF PUTATIVE MIGRATORY AND SEX PHEROMONES IN PACIFIC LAMPREY*	112
Williams, Mart	2:00 PM Green Room	*BROWN AND RAINBOW TROUT MOVEMENT PATTERNS IN THE PINE RIVER, MANISTEE COUNTY, MICHIGAN, RELATIVE TO THE REMOVAL OF STRONACH DAM*	112
Wilson, Aimee	1:30 PM Ballroom	*RECYCLING BEHAVIOR STUDY*	113
Wils-Plotz, Emma	9:30 AM Green Room	*THE NUTRITIONAL EFFICACY OF MARE'S MILK IN NEONATAL PIGS: A MODEL FOR THE HUMAN INFANT*	113
Wilton, Peter	9:30 AM Ballroom	*HYDRATION STATES OF MARS RELATED SULFATE MINERALS*	113
Witherspoon, Jenee	10:30 AM Green Room	*POTENTIAL NITROGEN CONTRIBUTION TO THE ENVIRONMENT FROM SIX TYPES OF EQUINE BEDDING*	114
Wohlgemuth, Krysette	9:30 AM Ballroom	*FACEBOOK @ MSU: STUDENT ATTITUDES AND USAGE*	114

Student Name	Time/Room	*Project Title*	Page
Woiderski, Sarah	9:30 AM Ballroom	*PUBERTAL EXPOSURE TO HIGH FAT DIET CAUSES STRAIN-DEPENDENT ALTERATIONS IN MAMMARY GLAND DEVELOPMENT AND ESTROGEN RECEPTOR STATUS IN MICE*	114
Wolaver, Laura	9:30 AM Ballroom	*ERADICATING GUINEA WORM DISEASE: LESSONS FROM UGANDA AND GHANA*	114
Won, Jinweon	3:00 PM Tower Room	*ORGAN DONATION: A COMPARATIVE STUDY*	90
Wood, Brian	11:30 AM Lake Superior Room	*ARTS OR CRAFTS*	61
Woodson, Andrew	2:15 PM Gold Room B	*ABAKUÁ SECRET SOCIETY: RELIGION, RACE AND CULTURE IN THE URBAN MATRIX OF CUBA*	115
Worhatch, Richard	9:30 AM Ballroom	*STRUCTURAL DETERMINATION AT SPACETIME LIMITS*	115
Wright, Michael	1:30 PM Parlors ABC	*FRESHMAN BRASS QUINTET*	116
Wright, Michael	9:30 AM Ballroom	*VARIABLE AQUEOUS ALTERATION AMONG CARBONACEOUS CHONDRITES*	115
Wyka, Jeffrey	2:30 PM Gold Room A	*SOME PROPERTIES OF GENERALIZED FIBONACCI POLYNOMIALS*	116
Yamanishi, Evan	10:00 AM Lake Erie Room	*EXAMINING URBAN TEACHER PREPARATION*	95
Young, Emily	1:30 PM Ballroom	*RESILIENCE WITHIN HEAD START PRESCHOOLERS: PREVALENCE OF DECA PROTECTIVE*	44
Zalewski, Zachary	9:30 AM Ballroom	*DEVELOPMENTAL EXPRESSION OF PPR PROTEINS IN TRYPANOSOMA BRUCEI*	116
Zalucha, Jessica	1:30 PM Green Room	*IMPACT OF EQUINE NUTRITION PRACTICES ON ENVIRONMENT*	68
Zang, Ian	1:30 PM Ballroom	*THE EFFECTS OF EMOTICONS ON INTERPERSONAL EVALUATIONS OF THEIR USERS*	36
Zanley, Elizabeth	1:30 PM Ballroom	*IS NONDIET ONLINE INTERVENTION FOR WEIGHT MANAGEMENT IN COLLEGE STUDENTS EFFECTIVE*	49
Zarski, Lila	11:00 AM Green Room	*AN ANALYSIS OF PRESSURE EXERTED BY DIFFERENT STYLES OF WINTER BLANKETS ON THE WITHERS OF HORSES*	116
Zimmerman, Joshua	9:30 AM Ballroom	*HYDRATION STATES OF MARS RELATED SULFATE MINERALS*	113
Zohdy, Nada	1:00 PM Tower Room	*MUSLIM AMERICAN IDENTITY*	117

Student Name	Time/Room	*Project Title*	Page
Zrull, Jesse	9:30 AM Ballroom	*PETROGRAPHY OF ANTARCTIC CM2 CARBONACEOUS CHONDRITE EET83250*	117
Zuehlke, Jesse	2:15 PM Green Room	*GMOS IMPLEMENTATION AND REGULATION AROUND THE WORLD*	117

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Many thanks to the dedicated faculty mentors who guided and supported the undergraduate research and creative activities presented today.

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Michael Orth, *Animal Science*
Jodi Ozimek, *Theatre*
Markus Pauly, *Plant Biology*
Amol Pavangadkar, *Journalism*
Scott Peacor, *Fisheries & Wildlife*
Anna Pegler-Gordon, *James Madison College*
James Pestka, *Food Science and Human Nutrition*
Simon Petersen-Jones, *Small Animal Clinical Sciences*
Karin Pfeiffer, *Kinesiology*
James Pivarnik, *Kinesiology, Epidemiology*
Lynmarie Posey, *Chemistry*
Carol Prahinski, *Marketing and Supply Chain Management*
Dennis Preston, *English*
Gavin Reid, *Chemistry*
Kristen Renn, *Educational Administration*
Don Ricks, *Agricultural, Food and Resource Economics*
Shawn Riley, *Fisheries and Wildlife*
Bryan Ritchie, *James Madison College*
Gary Roloff, *Fisheries and Wildlife*
Rene Rosenbaum, *CARRS*
Rob Roznowski, *Theatre*
Chong-Yu Ruan, *Physics and Astronomy*
Ann Marie Ryan, *Psychology*
Steve Safferman, *Biosystems Engineering*
Tao Sang, *Plant Biology*
Michael Schechter, *Political Science*
Tom Schmidt, *Microbiology & Molecular Genetics*
Cristina Schmitt, *Linguistics and Languages*
Mark Scriber, *Entomology*
Barbara Sears, *Plant Biology*
John Sherry, *Communication*
Sayuri Shimizu, *History*
Alex Shingleton, *Zoology*
Janice Siegford, *Animal Science*
Brian Silver, *Political Science*
Jill Slade, *Radiology Osteopathic Medicine*
Roger Smeltekop, *Music Therapy*
Sandi Smith, *Communication*
Aminda Smith, *History*
Horace Smith, *Physics and Astronomy*
Nicole Sowinski, *Art & Art History*
Elizabeth Spence, *WRAC*
Christy Sprague, *Crop and Soils Sciences*
Paulette Stenzel, *Finance*
R. Jan Stevenson, *Zoology*
Mark Sullivan, *Music Composition*
Greg Swain, *Chemistry*
Carl Taylor, *Sociology*
Suzanne Thiem, *Microbiology and Entomology*
Richard Thomas, *History*
Laurie Thorp, *RISE*
James Tiedje, *Microbiology and Molecular Genetics*
Frederick Tims, *Music Therapy*
Nathalie Trottier, *Animal Science*
Denise Troutman, *WRAC and Linguistics*
Bruce Uhal, *Physiology*
Steve van Nocker, *Horticulture*
Bruce Vanden Bergh, *Advertising, Public Relations & Retailing*
Michael Velbel, *Geological Sciences*
Patrick Venta, *Microbiology & Molecular Genetics*
Anne Violin-Wigent, *French, Classics, and Italian*
Edward Walker, *Microbiology*

John Waller, *History*
Joseph Walther, *Communication; TISM*
David Weliky, *Chemistry*
Barry Williams, *Zoology*
Karen Williams, *Obstetrics Gynecology & Reproductive Biology*
Barry Williams, *Zoology*
Marilyn Wilson, *English*
Brian Winn, *TISM*
Robert Wiseman, *Physiology*
Adrienne Woodward, *Animal Science*
Jeffrey Wray, *English*
Sang-Seon Yun, *Fisheries and Wildlife*
Vilma Yuzbasyian-Gurkan, *Micobiology and Molecular Genetics*
Maria Zavodszky, *Biochemistry*
Aklilu Zeleke, *Lyman Briggs College*
Sally Zhang, *Biochemistry*
Matt Zierler, *James Madison College*

For more information on how you can contribute to UURAF, please contact:

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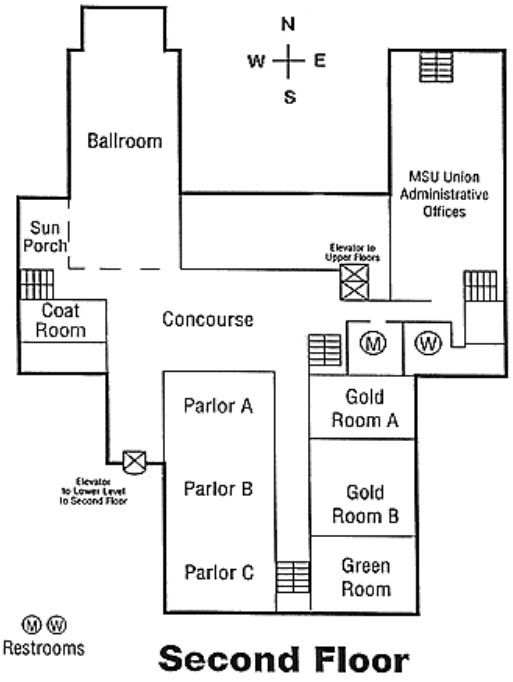
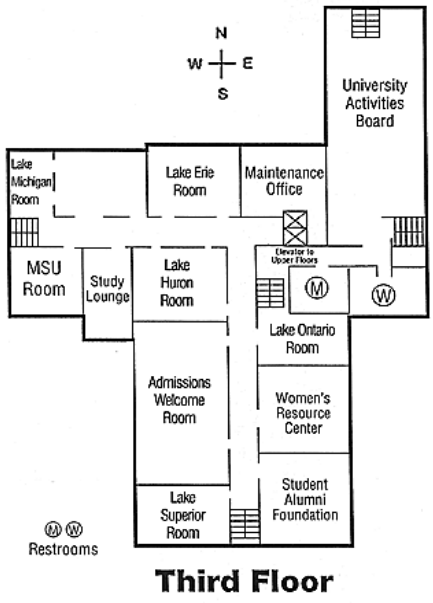
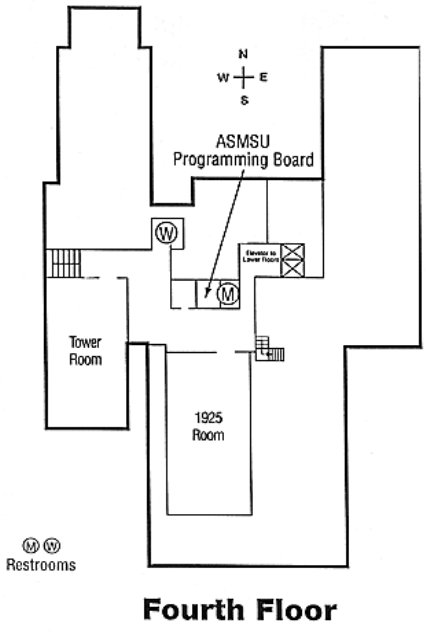
Layout of MSU Union







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

UURAF 2009 will be on Thursday, April 16, 2009 in the MSU Union.

Undergraduate Research

MICHIGAN STATE UNIVERSITY