

UNIVERSITY OF WISCONSIN-MADISON

Undergraduate Research Symposium 2004



*Celebrating
research,
creative
endeavor
and service
learning*

ABSTRACTS

Undergraduate Research Symposium 2004

Celebrating Research, Creative Endeavor and Service Learning

UW–Madison Memorial Union

April 15, 2004

- 9:45 am Welcome to Student Participants,
by Associate Vice Chancellor Virginia Sapiro
- 10:00 am–4:00 pm Posters and Art/Research displays, Great Hall
- 10:00 am–11:30 am Oral Presentations, Session I
(see signs for locations)
- 12:00 pm–1:30 pm Oral Presentation, Session II
- 2:00 pm–3:30 pm Oral Presentations, Session III

Refreshments will be available starting at 9:30 a.m. and will be available throughout the day in Great Hall.

Undergraduate Research Symposium 2004

Celebrating Research, Creative Endeavor and Service Learning

*University of Wisconsin – Madison
April 15, 2004*

The annual Undergraduate Symposium is a celebration of undergraduate students' achievements, creativity and service learning across all the schools and colleges of the university. The symposium includes presentations, poster displays and performances representing the arts and humanities, biological sciences, physical sciences, and social sciences. These original works showcase the vast range of talent and creativity found within the university's undergraduate population.

The sixth annual Undergraduate Symposium is sponsored by the Brittingham Trust and the Office of the Provost, through the stewardship of the Undergraduate Research Scholars Program, the Center for Biology Education, the Morgridge Center for Public Service, and The Wisconsin Union.

A Special Thanks!

We would like to thank the Undergraduate Research Scholars Program for giving our Annual Symposium a permanent home, and its director, Akua Sarr, for her tremendous leadership efforts. We would like to thank the student participants, their mentors, and the many individuals who have helped to organize this symposium. It has been a great team effort.

A special and grateful thanks is also extended to Ruthi Duvall of The Wisconsin Union; Marc Kennedy of the Union's Graphic Design and Marketing Department; Melissa Tedrowe of the Writing Center; Nick Weaver, Nancy Brower, and Tricia Dickinson at University Communications; and Brian Busby and Mike Tessmer of the Division of Information Technology.

Organizing Committee

Jane Harris Cramer, Jennifer Gulig, Laurie Mayberry, Virginia Sapiro, Akua Sarr, Randy Wallar

Cover photos by Michael Forster Rothbart and Stephanie Judge

Student	Major	Mentor(s); Department	
Adams, Monica	Bacteriology	Kathy Kurth; Pathobiological Sciences/Virology	
Alkon, Rachel	English	Douglas McLeod; Journalism	
Anderson, Brian	English, Anthropology	Cyrena Pondrom; English and Women's Studies	
<i>Team project: (alphabetically by team leader)</i>			
Austad, Casey	Textile Design	Anna Stevens; Environment, Textiles and Design	
Barnett, Monica	Textile & Apparel Design		
Black, Melissa	Apparel Design		
Braun, Rhonda Marie	Pre Apparel Design		
Christenson, Kimberly	Textile and Apparel Design		
Deeley, Sarah	Textile Design		
Draves, Stephanie	Apparel Design		
Friedman, Jana	ETD		
Hoag, Erin	Apparel Design		
Jones, Ashley	Textile Design		
Macknica, Anna	Apparel Design		
Obradovich, Laura	Textile Design		
Ruel, Susie	Apparel Design		
Schlosser, Amy	Textile and Apperal Design		
Babin, Amanda	Undecided		Morton Gernsbacher; Psychology
Bachand, Sheila	Nursing		Sandra Ward; Nursing
Bauer, Patrick	Medical Microbiology and Immunology	Jack Nitschke; Psychiatry	
<i>Team project: (alphabetically by team leader)</i>			
Benton, Kristie	HDFS	Julie Poehlmann; Human Development & Family Studies	
Seifert, Rebecca	Psychology		
Voegtline, Kristi	HDFS`		
Vue, Mai	Undeclared		
Berry, Raven	Legal Studies	Robert San Juan; Human Development & Family Studies	
Bertling, Kristen	Genetics	Matyas Sandor; Pathology	
Bethke, Lynn	Anthropology	Sissel Schroeder; Anthropology	
Bhatia, Sanjeev	Biology	Akua Sarr; African Languages and Literature	
<i>Team project: (alphabetically by team leader)</i>			
Bichler, Allison	Biology	Michelle Harris; Biology Core Curriculum (Biocore)	
Swenson, Annika	Biology		
Bluske, Krista	Biology/Neurobiology	Jack Nitschke; Psychiatry	
Booth, Eric	Civil Engineering	Kenneth Potter; Civil Engineering	
Bresnahan, Lauren	International Relations	Marlys Macken; Linguistics	
Brown, Sarah	Spanish Literature	Michael Stevens; Botany	
Brown, Justin	Physics	Stanley Dodson; Zoology	
Burks, Dominic	Zoology	Jackson Gross; Wildlife Ecology	
Cain, Benjamin	Physics/Math/Astronomy	Peter Timbie; Physics	
Callahan, Margie	Biology	Yu Zhang; Surgery	
Carver, Alexander	Physics	Robert Morse; Physics	
<i>Team project: (alphabetically by team leader)</i>			
Cassandra, Gabus	Biology	Susan Riesch; Research	
Farwell, Lisa	Undecided		
Castillo, Alex	Biology	Joel Pedersen; Soil Science Carole H. L. Hsiao; Curriculum and Instruction	
Chagolla, Regina	Elementary Education		

Student	Major	Mentor(s); Department
Chang, Chia-Wei	Biochemistry	James Keck; Biomolecular Chemistry
Chang, Andrew	Biochemistry	Robert Blank; Endocrinology
Chapman, Elizabeth	Biochemistry	Paul Bertics; Biomolecular Chemistry
Cherney, Samantha	Journalism	Michelle Nelson; Journalism & Mass Communication
Chia, Poh Hui	Biochemistry	Jamey Weichert; Radiology
Clark, Andrew	Biology	Mark Brownfield; Comparative Biosciences
Comeau, Asia	Computer Science	Alexander Grunewald; Psychology
Cunningham, Angela	Social Welfare	Sherrill Sellers; Social Work
Daniels, Erran	Elementary Education	Eric Knuth; Curriculum and Instruction
Danilova, Victoria	Nursing	Linda Baumann; Nursing
Date, Lauren	Undecided	Matthew Tift; Musicology
Delventhal, Naomi	Zoology	John Lyons; Zoology
<i>Team project: (alphabetically by team leader)</i>		
Dewi, Diana	Textile and Apparel Design	Wendy Hagedorn; Apparel and Textile Design
Kittleson, Jennifer	Apparel and Textile Design	
Dewi, Diana	Apparel Design	Anna Stevens; Apparel and Textile Design
Diamond, Michael	Psychology	Olga Godes; Psychology
Ding, Jerry	Electrical Engineering	Dean Tompkins; Civil and Environmental Engineering
Dooghan, Daniel	Comparative Literature	Max Statkiewicz; Comparative Literature
Dorneanu, Iulia	Undecided	Nancy Potter; Communicative Disorders
<i>Team project: (alphabetically by team leader)</i>		
Draves, Stephanie	Textile and Apparel Design	Anna Stevens; ETD
Wendelborn, Katherine	Textile and Apparel Design	
Dustin, Simone	Biology and Nutritional Sciences-Natural Sciences	Carl Stafstrom; Neurology
Dvorak, Nancy A.	Biology	Claude Heintz; Dance Program
Eggers, Zachary	Biochemistry	Jayne Squirrell; Anatomy
Eisenthal, Andrew	Undecided	Julia Evans; Communicative Disorders
Estante, Sophia	English	Lorrie Moore; English
Farhoud, Mohammed	Biochemistry	Arthur Ellis; Chemistry
Finch, Rachel	Interior Design	David Wells; Environment, Textiles, and Design
<i>Team project: (alphabetically by team leader)</i>		
Finesilver, Elizabeth	English	Pamela Oliver; Sociology
Zec, Tamara	Neurobiology	
Fink, Margaret	English/Art History	Cyrena Pondrom; English
Flick, Kate	Sociology, Environmental Studies, Global Cultures	Nancy Langston; History
Ford, Simon	History	Victoria Pagan; Classics
<i>Team project: (alphabetically by team leader)</i>		
Franke, Kara	Biology	James Ntambi; Biochemistry
Keller, Melissa	Biochemistry	
Krueger, Kelly	Nutritional Sciences	
Myal, Dwayne	Nutritional Sciences	
Richman, Aliza	Nursing	
Riley, Christine	Genetics	
Stoltzmann, Caitlin	Dietetics	
Frye, Julia	Biology	Sharon Younkin; Family Medicine
Gandhi, Miti	Molecular and Cellular	Herb Chen; Surgery

Student	Major	Mentor(s); Department
Ganev, Diane Garcia, Dina	Biology Urban Design Bacteriology	Betty Kramer; School of Social Work Garet Lahvis; Division of Plastic and Reconstructive Surgery
Gerhart, Jacqueline Ghotra, Amaninderpal Gillen, Sophia	Biomedical Engineering BME Cultural Anthropology	Murray Katcher; Pediatrics Nihal Ahmad; Dermatology Keith Cohen; Comparative Literature
<i>Team project: (alphabetically by team leader)</i>		
Gorenc, Kathleen Smith, Jenna	Nursing Nursing	Teresa Pellino; School of Nursing
Gray, Amanda Green, David	Legal Studies/Sociology Inter-Arts & Technology	Beth Quinn; Sociology Leslie Kohlberg; Letters&Science and Human Ecology Career Services
Grewal, Kavneet Jessie Grover, Amy Guarascio, Matthew	Philosophy/Psychology MMI Biology	David Hatfield; Educational Psychology Laura Hogan; Pathology and Laboratory Science Gary Lake; Life Sciences Communication
Hahn, Melissa Hallahan, Courtney Hammond, Kimberly Harrison, Colin Harun, Aisha Heckendorf, Amy Her, Yeng Herman, Benjamin Ho, Chu Kwen Hoegger, Mark	Biomedical Engineering Genetics MMI Genetics Undecided Spanish Chemistry History Genetics and Bacteriology Biochemistry	Jamey Weichert; Department of Radiology Jill Kolesar; Pharmacy Douglas McNeel; Medical Oncology Hasan Khatib; Dairy Science Kenneth Zeichner; C&I Akua Sarr; African Languages and Literature Marlys Macken; Linguistics Jean Lee; History Carlos Flores; Genetics Leonard Levin; Ophthalmology and Visual Sciences
Hofer, Andrea Hoffman, Kristi Hong, Lewis Howlett, Noel	Interior Design Genetics Bacteriology Psychology and German	Mark Nelson; ETD Richard Pauli; Medical Genetics Richard Amasino; Biochemistry Diane Gooding; Psychology
Jaspers, Anne Jolly, Amy	Social Work and Spanish Undecided	Sandy Magana; Social Work Jamey Weichert ; Radiology
Karls, Angela Kauders, Paul Kiedrowski, Megan	Pre-Pharm.D. Pre-Business Medical Microbiology and Immunology	Bernard Rousseau; Communicative Disorders Akua Sarr; African Languages and Literature Joseph Dillard; Medical Microbiology and Immunology
Kleinsasser, Lynnette Kopplin, Laura Kragness, Julia	Anthropology Biochemistry Occupational Therapy	Sissel Schroeder; Anthropology Paul Bertics; Biomolecular Chemistry Elizabeth Larson; Kinesiology, Occupational Therapy Program
Kriplean, Travis Krueger, Rebecca	Computer Science Genetics	Klaus Berghahn; German Charles Czuprynski; Pathobiological Sciences

Student	Major	Mentor(s); Department
Lahti, Amber	HDFS	Julie Poehlmann; HDFS
Langness, Jacob	Biology	Jack Staub; Horticulture
Larrison, Molly	Political Science	Charles Franklin; Political Science
Lawson, Katherine	History of Science	Rick Lindroth; Entomology
Lee, Eric	Biomedical Engineering	Reagan Miller; Chemistry
Lesi, Adebanke	Biology	Chris Day; Botany
Lesi, Adedayo	Economics	Ananth Seshadri; Economics
Lim, Xinhong	Biochemistry	Bernard Rousseau; Communicative Disorders
Lionel, Lim	Bacteriology	Michel Wattiaux; Dairy Science
Liss, Adam	Biology/Spanish Lit.	Chris Bradfield; Oncology
Liu, Jenny	Biochemistry	Carl-Erik Tornqvist ; Botany
Liu, Yang	Biology	Mark Brownfield; Comparative Biosciences
Lo, Edward	Molecular Biology	Mark S. Brownfield; Comparative Biosciences
<i>Team project: (alphabetically by team leader)</i>		
Lo, Ge	Zoology	Diane Gooding; Psychology
Moua, Amanda	Psychology	
Xiong, Youa	Pharmacy	
Lor, Mai Youa	Neurobiology	Jack Nitschke; Psychiatry
Luther, Amy	Genetics	Raymond Kessel; Genetics
Mai, David	Biomedical Engineering	Douglas McNeel; Medicine / Medical Oncology
Marsh, Amanda	Biology	Ei Terasawa; Pediatrics
Mason, Michael	Political Science/Legal Studies	Nina Emerson; Resource Center on Impaired Driving
McCarthy, Julia	Biology	Jake Vander Zanden; Zoology
McLeod, Garnet	Political Science	Paul Schlomer; LaFollette School of Public Affairs
Mehta, Tara	Medical Microbiology and Immunology	David A. Baum; Botany
Mehta, Sarita	Psychology	Arthur Glenberg; Psychology
Melgoza, Maria	Pharmacy	Ivy Corfis; Spanish and Portuguese
Menon, Ayswarya	Psychology	Brian Bell; Neurology
Micic, Dejan	Molecular Biology	Eugene Kaji; Medicine
Mills, Jordan	Nutritional Sciences	Sherry Tanumihardjo; Nutritional Sciences
Moses, Faun	Sociology	Gary Sandefur; Sociology
Nguyen, Wendy	Asian Studies and Political Science	Ronald Kalil; Ophthalmology and Visual Sciences
Nguyen, Beau	Molecular Biology	Eugene Kaji; Medicine
Niebuhr, Emily	Atmospheric and Oceanic Sciences	Matthew Hitchman; Atmospheric and Oceanic Sciences
Novakofski, Kira	Biochemistry	Pamela Doolittle; Chemistry
O'Brien, Megan	Biology	Gary Jones; Communicative Disorders
Offor, Chiemeka	Pre-Pharmacy	Jeanine Mount; Social & Administrative Sciences
O'Neil, Tyriina	Biochemistry	Robert Blank; Medicine
Orosco, Natalie	Rehabilitation Psychology	Kimber Malmgren; Rehab Psych & Special Education
Orozco, Angelina	Genetics	Jamey Weichert; Radiology
Parikh, Rujuta	Russian, Biochemistry	Bernard Rousseau; Communicative Disorders
Paul, Chen	Electrical Engineering	Wei-Yin Loh; Statistics
Paulson, Ben	Secondary Education-Biology	Ei Terasawa; Primate Center
Pfister, Kyle	Biology	Craig Berridge; Psychology
Pineda, Andrew	Undecided	Carole Hsiao; Education
Pius, Rachael	Psychology	Alexander Grunewald; Psychology and

Student	Major	Mentor(s); Department
Pletz, Jennifer Price, Fawnah Prokop, Keriann Pulver, Amara	Geography Bacteriology Interior Design Nutritional Sciences	Physiology Tara Root; Geology and Geophysics Barbara St. Pierre Schneider; Nursing Mark Nelson; ETD Lingjun Li; Pharmaceutical Sciences
Raam, Sonja Rademacher, Jenelle Rahn, Lucy Ramaswamy, Greg Rao, Prakash	Undecided Nursing French Political Science Biomedical Engineering	Nita Sahai; Geology & Geophysics Carolyn Aradine; Nursing Sharon Dunwoody; Journalism Jon Pevehouse; Political Science Charles Mistretta; Medical Physics, Radiology and Biomedical Engineering Tim Osswald; Mechanical Engineering Pam Kling; Pediatrics Matyas Sandor; Pathology and Laboratory Medicine Anna Huttenlocher; Pharmacology Richard Moss; Physiology
Reddick, Mathew Reddy, Hima Rhter, Sasha	Chemical Engineering Molecular Biology Medical Microbiology and Immunology	Jamey Weichert; Radiology Akua Sarr; African Languages and Literature Leonard Levin; Ophthalmology and Visual Science
Rodgers, Mary Rose, Bradley	Biochemistry English	Lauren Trepanier; Medical Sciences Marvin Wickens; Biochemistry Deborah Jensen; French and Italian
Savengseuksa, Sarah Scherkenbach, Kristen	Biology Medical Microbiology and Immunology	Julie Poehlmann; HDFS Elisabeth (Betty) Hayes; Curriculum & Instruction
Schlieve, Christopher	Biochemistry and Neurobiology	Macken Marlys; Linguistics
Scott, Jessica Seow, Yiqi Sheth, Neha	Pharmacology and Toxicology Molecular Biology International Studies, Political Science	John Curtin; Psychology Richard Davis; Jazz Robert Hamers; Chemistry Gary Sandefur; Sociology John Loffredo; Primate Research Center Timothy Shedd; Mechanical Engineering Steve Ackerman; Atmospheric and Oceanic Sciences
Shlafer, Rebecca Silberman, Lauren	HDFS Individual Major/School of Education	Daniel van der Weide; Electrical and Computer Engineering Stephen Quintana; Counseling Psycholog Larry Edgerton; AAP
Sith, Kannitha	Political Science and Afro. American Studies with a certificate in Womens Studies	Kirk Parkin; Fiday Chair of Vegetable Processing Research Jackson Gross; Wildlife Ecology Marlys Macken; Linguistics
Sloan, Jennifer Smith, Ingrid Smith, Elisabeth Solis, Vanessa Spencer, Sean Spike, Benjamin Staude, Jessica	Psychology Undecided Chemistry Social Work MMI Physics Atmospheric and Oceanic Sciences	James Knox; Geography Amy Moser; Human Oncology Jeffrey Lewis; Human Development and Family Studies Marshall Onellion; Physics
Stevens, Andrew	Electrical Engineering	
Streubel, Mary Sutaj, Visar	Political Science/Sociology Political Science and English	
Tam, Tammy	Food Science	
Tamez, Michelle Tehan, Kati	Wildlife Ecology Undeclared (with CommArts/ Journalism intent)	
Tennessee, Travis Terlizzi, Rebecca Thao, Chai	Geography Nursing Human Development and Family Studies	
Thao, Say	Pre-Clinical Laboratory Science	
<i>Team project: (alphabetically by team leader)</i>		
Tollgaard, Laura Whiteaker, Stephanie	Political Science History	Tyina Steptoe; History

Student	Major	Mentor(s); Department
Tran, Michael	Medical Microbiology and Immunology	Daesung Lee; Chemistry
Triick, Mary	Political Science	David Parker; Political Science
VanderWielen, Lynn	Biology	Miles Epstein ; Anatomy
Viana, Alex	Astronomy - Astrophysics	Eric Wilcoats; Astronomy
Vidaillet, Kelsey	Spanish and Latin American, Caribbean and Iberian Studies (LACIS)	Humberto Vidaillet; Volunteer Staff - Cardiology
Vu, Jonathan	Biology	Robert Blank; Endocrinology
Vue, Khou	Biology	Marlys Macken; Linguistics
Wagner, Joel	Chemical Engineering	Sean Palecek; Chemical and Biological Engineering
Walters, Meghan	Genetics	Shawn Kaeppler; Dept. of Agronomy
Wang, Zhenxun	Molecular Biology	Xianming Yu; Oncology
Wilkins, Jesse	Chemistry	Laura Kiessling; Chemistry
Williams, Bonnie	Broadcast Journalism	Doug McLeod; Journalism
Williams, Kiyana	Psychology	Seth Pollak; Psychology
Wong, Steven	Biology	Melissa Murphy; Communications Processes Unit
Xiong, Mai Phia	Elementary Education	Marlys Macken; Linguistics
Yang, Pa Nhia	Human Development and Family Studies	Laurie Ellis McLeod; Human Development and Family Studies
Yildiz, Mehmet	Electrical-Math	Robert Nowak; Electrical Engineering
Zewdie, Selamawit	Sociology	Christopher Lawson; Waisman Center
Zhang, Mingzi	Bacteriology	Lingjun Li; Pharmacy

EVALUATION OF REAL TIME PCR ASSAYS FOR BOVINE RESPIRATORY SYNCYTIAL VIRUS AND BOVINE CORONA VIRUS

Monica Adams and Kathy Kurth (Mentor), Pathobiological Sciences/Virology

Each year, bovine respiratory disease complex (BRDC) costs the dairy industry millions of dollars in revenue. Timely diagnosis of BRDC infections is of paramount importance for the treatment of acute respiratory tract infections in cattle. Hence, a sensitive molecular method must be employed to characterize primary viruses in BRDC, including bovine respiratory syncytial virus and bovine corona virus. In order to facilitate efficient diagnosis, we propose to develop a real time reverse-transcription polymerase chain reaction (PCR) to detect these BRD pathogens. We will compare the results obtained from the real time PCR with clinical signs, histopathology results and conventional PCR confirmed at an outside laboratory.

THE PERCEPTUAL AND BEHAVIORAL EFFECTS OF DAVIDSON'S THIRD PERSON PERCEPTION HYPOTHESIS

Rachel Alkon and Douglas McLeod (Mentor), Journalism

Concern about potential harmful effects of violent videogames has recently led critics to call for censorship to protect the public. As such, this situation lends itself to the study of the perceptual and behavioral components of Davidson's third-person effect hypothesis. This hypothesis states that people perceives violence in video games to have a greater impact on others than on themselves (perceptual component), and that these perceptions lead people to take actions, such as censorship, to prevent the impact (behavioral component). An Internet-based survey was conducted on Journalism and Communication Arts students to examine the antecedents and consequences of the perceived effects of playing videogames. Our analysis focuses on the impact of gender, political orientation and paternalistic lineage between these factors and support for government action regarding such videogames.

HUMANIZING HYPERTEXT: JEROME MCGANN IN THE STRUCTURALIST AND DECONSTRUCTIVE TRADITION

Brian Anderson and Cyrena Pondrom (Mentor), English and Women's Studies

Jerome McGann offers an experimental, philosophical approach to literary study that involves the documentation and textualization of the reader's responses to the text. His philosophical nominalism offers an approach to questions of "meaning production." Bibliographical elements of the text - the material level of the text as well as the contextual texts - become emergent semiotic systems. The text is therefore a "helix of bibliographic and linguistic codes." The event of reading becomes the site in which alternate texts are created. These texts offer information about the reader's horizon in a deconstructive manner. Since cognition occurs through material forms, McGann's textualization offers the interpreters of literary texts a unique perspective on human cognition. This resembles cognitive science in that it is involved in the documentation of n-dimensional cognitive topologies.

MERITER HOSPITAL PREGNANCY AND INFANT LOSS PROJECT

Casey Austad, Monica Barnett, Melissa Black, Rhonda Marie Braun, Kimberly Christenson, Sarah Deeley, Stephanie Draves, Jana Friedman, Erin Hoag, Ashley Jones, Anna Macknica, Laura Obradovich, Susie Ruel, Amy Schlosser and Anna Stevens (Mentor), Environment, Textiles and Design

The loss of a baby before or shortly after birth can take a tremendous emotional toll on expectant parents. Bonding with the infant, through bathing and dressing the baby in a special garment, helps parents experience a healthier grieving process. The baby may be buried in the garment, but more often the garment is taken home as a remembrance. Procuring clothing to fit these infants is a significant problem for hospitals because existing garments are too large, incorrectly proportioned, and do not meet the special needs of dressing a deceased infant. Two lecturers developed correctly proportioned garments for these infants. This semester our class is producing a prototype of patterns, directions, embellishment techniques, and an informational video for distribution to hospitals nationwide.

SUBTYPE OF AUTISM: DEVELOPMENTAL VERBAL DYSPRAXIA

Amanda Babin and Morton Gernsbacher (Mentor), Psychology

The purpose of this research is to identify a subtype of autism called Developmental Verbal Dyspraxia (DVD). DVD is a motor-speech problem, disabling oral-motor movements needed for speaking. The first phase of the project involves a screening interview where we identify DVD and Non-DVD kids. We also use home videos to validate answers on the screening interview. The final phase involves home visits where we use several assessments to confirm the child's diagnosis and examine the connection between manual and oral motor challenges. By identifying DVD as a subtype of Autism, we will eliminate the assumption that all Autistics have the same characteristics. This will allow for more individual consideration of Autistic people and may direct future research on the genetic factors in autism.

OVERCOMING BARRIERS TO PAIN MANAGEMENT: A REPRESENTATIONAL APPROACH

Sheila Bachand and Sandra Ward (Mentor), Nursing

Research suggests that patients develop beliefs (representations) about illnesses that are often inaccurate. These representations influence how patients cope with illness and associated symptoms, including pain. Beliefs that are barriers to optimal pain management (i.e. fear of addiction to medications) arise from representations. Accurate information must replace these beliefs to enable patients to attain adequate pain control and high quality of life. Effective education should address barriers to pain management in the context of illness representations. The Representational Intervention to Decrease Pain (RIDPAIN) is an example of this approach. RIDPAIN is currently being compared to care as usual in a randomized trial. Reported here are the results of a secondary analysis of RIDPAIN's effect on pain control, quality of life, and barriers to pain management.

ELECTRODERMAL CORRELATES OF BRAIN ACTIVATION DURING AVERSION

Patrick Bauer and Jack Nitschke (Mentor), Psychiatry

Abstract: Electrodermal activity is one of the most frequently measured response systems in neurophysiology. The skin is a dynamic organ that receives signals from the brain which produce measurable electrical changes known as electrodermal activity. Our study measures skin conductance by using two electrodes to measure the electrical response to the passage of an external current across the skin. While subjects participated in a functional magnetic resonance imaging study, they viewed a series of pictures preceded by warning symbols: an “X” predicted an aversive picture, a circle predicted a neutral picture, and a question mark predicted either a negative or neutral picture. Electrodermal activity was measured during both warning symbol and picture presentation. Electrodermal data will be correlated with areas of the brain activated during the anticipation of and reactivity to the aversive and neutral pictures.

ASSESSING ATTACHMENT IN PRETERM INFANTS: THE STRANGE SITUATION

Kristie Benton, Rebecca Seifert, Kristi Voegtline, Mai Vue and Julie Poehlmann (Mentor), Human Development & Family Studies

For the past year, we have been involved in a study of preterm infants at six time points over a span of two years, starting at hospital discharge. The strange situation laboratory procedure is conducted during the fifth time point, or sixteen months following the infants due date. This procedure is a measure of the infant-mother attachment relationship and consists of seven separation and reunion episodes. Through careful observation of the infant’s behavior during reunion with the mother, we can examine the quality of the developing parent-child relationship. We have undergone training for the roles of experimenter, stranger, and camera, and learned about challenges that preterm infants face in their development. This presentation will describe our observations of preterm infants during the attachment assessment.

CHILD DEVELOPMENT: HOW CHILDREN PERCEIVE FRIENDSHIPS

Raven Berry and Robert San Juan (Mentor), Human Development & family Studies

The current study focuses on preschool friendship quality and how young children perceive their friendships. Each child participates in a story completion task where an interviewer presents a series of story beginning or “stems,” using human figures and basic props. Each stem describes the child and his or her best friend in various social situations. After hearing each stem, children are invited to complete the story. Children’s responses are hypothesized to reflect the perceptions that the children have of their friendships. In addition, the children’s teachers give their perceptions of the friendships through questionnaires. Children’s story task responses are compared to teacher questionnaires to examine relationships between child and teacher perceptions of the friendships.

T CELL - T CELL COOPERATION IN AN ANTIGEN SPECIFIC INFLAMMATORY IMMUNE RESPONSE

Kristen Bertling and Matyas Sandor (Mentor), Pathology

In a wild-type organism, there are millions of T cells, which makes it difficult to detect a specific type of cell. Thus, mouse populations have been made to have two different T cell specificities by various methods of injection. These mice are then immunized with a specific antigen and the organs of interest are processed. The DNA and RNA are extracted from these organs and cDNA is made from the RNA using reverse transcription. Then, real-time PCR (polymerase chain reaction) is used to measure the presence and relative proportions of the different T cells. Absolute number of cells can be determined using genomic DNA, and other variables can be measured with RNA and cDNA. These results will be used to aid in the understanding of T cell interaction in primary immune responses in the central nervous system with a sensitivity that is better than other methods.

A COMPARISON OF METHODS OF LITHIC DEBITAGE ANALYSIS

Lynn Bethke and Sissel Schroeder (Mentor), Anthropology

The analysis of lithic debitage, the waste created during the production of stone tools, can provide a great deal of information regarding the tool making activities which once took place at an archaeological site. My project explores the relationship between two prominent systems of lithic debitage analysis: the Primary, Secondary, Tertiary (PST) technique and the Sullivan and Rozen technique (SRT). The PST assumes that there is a reduction sequence and is based in size and cortex percentages. The SRT is touted as being free of interpretation biases, and is based in dichotomous attributes of flakes. Using data from a level below the plow-zone at the Skare site in Dane County, I analyzed the same data according to both systems, which has hitherto not been done. To do so, relatively simple statistical techniques were employed. My research demonstrates that, despite debates in the literature, the two systems are complementary and yield similar interpretations.

HIV'S ECONOMIC AND SOCIAL IMPACT ON SUB-SAHARA AFRICA

Sanjeev Bhatia and Akua Sarr (Mentor), African Languages and Literature

In recent years, Africa has come under the spotlight because the HIV infection rate is astounding. In fact, many studies now report that the virus's effect on this continent is devastating. HIV-AIDS is now the leading cause of death in sub-saharan Africa and is currently afflicting some 29.4 million citizens. From a social perspective, the prevalence of this disease results in a breakdown of the traditional family because family incomes are dropping and children are often orphaned by an AIDS death. Naturally, this tragic loss breeds many social problems in the continent's larger cities. From an economic perspective, the disease drastically affects agricultural and industrial efficiency. Many of the region's industrial giants are now taking measures to curb the transmission and onset of the disease.

RED BULL: THE ENERGY DRINK THAT ‘GIVES YOU WINGS’...OR DOES IT?

Allison Bichler, Annika Swenson and Michelle Harris (Mentor), Biology
Core Curriculum (Biocore)

Our research assesses the claims made by Red Bull energy drink that its active ingredients, caffeine and taurine, can improve short-term memory. Our experimental protocol has human subjects consume caffeine and taurine or a placebo while we monitor their heart rate and blood pressure. After the treatment has had time to take effect, the subjects take a short-term memory test. We compare the memory test results between the placebo treatment and the caffeine and taurine treatment. Preliminary data suggest that while caffeine and taurine have physiological effects (increased heart rate), they do not appear to improve short-term memory. Additional testing will be done on human subjects to further examine the physiological and memory effects of caffeine and taurine consumption.

MEMORY RECALL AND BRAIN ACTIVATION PATTERNS IN RESPONSE TO AVERSIVE STIMULI

Krista Bluske and Jack Nitschke (Mentor), Psychiatry

Our study aims to establish a correlation between areas of brain activation in response to aversive stimuli and memory recall. We use functional MRI to study healthy subjects as they view pictures preceded by one of three warning symbols: an aversive warning symbol (an “X”) precedes an aversive picture, a neutral warning symbol (a circle) precedes a neutral picture, and an ambiguous warning symbol (a question mark) precedes either an aversive or neutral picture. Subjects recall of pictures presented during their scan is tested either immediately following the scan or two weeks later. These recall data will be correlated with brain activation patterns for anticipation of and reactivity to aversive pictures. We expect to find better recall for aversive pictures preceded by an aversive warning than aversive pictures preceded by an ambiguous warning. We also expect recall of all aversive pictures to be greater than recall of neutral pictures.

DEVELOPING A STORMWATER AUDIT TO IMPROVE URBAN WATER RESOURCES IN RESIDENTIAL AREAS

Eric Booth and Kenneth Potter (Mentor), Civil Engineering

Urbanization degrades water resources by decreasing quality, increasing the quantity that runs off the land surface, and decreasing the amount of groundwater discharge to surface waters. This research, performed in the summer of 2003, focused on ways to mitigate these impacts in urban residential areas. By visiting 32 sites, a stormwater audit was developed and applied to estimate how residential properties handle stormwater runoff and offer ways to improve the management on-site through modest practices such as rerouting of a downspout or the creation of a rain garden. Also, soil samples from each site helped to determine whether the addition of fertilizer, which can have adverse impacts on lake ecosystems, is necessary to create the proper level of phosphorus for a healthy lawn.

SOUTHEAST ASIAN POLITICAL ACTION COMMITTEE: DEMOCRACY AT WORK!

Lauren Bresnahan and Marlys Macken (Mentor), Linguistics

Upon receiving the Wisconsin Idea Undergraduate Fellowship the summer and fall 2003 semesters were spent designing and implementing a Hmong Political Council, Inc. (HPC). The fellowship addressed the immediate need felt by our local government and the Hmong refugee community to develop a political voice expressing the economic, political, and social needs of the Hmong refugee community. It was implemented through the collaboration of the United Refugee Services of Wisconsin, Professor Macken, the Hmong community, and myself. Extensive research was conducted at the local, state, and national level involving the studying of IRS requirements, lobby rights, other political councils, and the needs of the Wisconsin Hmong community. HPC is now a legal non-profit organization that has held two fundraisers, released press statements, and worked with State and National political figures to address the needs of the Hmong community. Within the year HPC plans to be lobbying at the state level.

THE EFFECTS OF LOW CONCENTRATION ATRAZINE TO SEX RATIO OF THE INDICATOR SPECIES DAPHNIA MAGNA.

Justin Brown and Stanley Dodson (Mentor), Zoology

Egg carrying female daphnids were exposed to atrazine, a commonly used herbicide, at low concentrations (100, 10, 1, and 0.5 ppb) using the bioassay setup in order to assess the variance of sex ratio for offspring. This study shows that there is a significant increase of males being reproduced when the acute exposure (7 day) assay is carried out. Furthermore, the assessment proposes that atrazine presence in lakes and streams poses a threat to freshwater ecosystems on account of food chain modifications, biodiversity, and freshwater organism populations.

BIOGEOGRAPHY OF CHEMICAL DEFENSE IN BIRCH TREES

Sarah Brown and Michael Stevens (Mentor), Botany

The Latitudinal Defense Hypothesis predicts that levels of defense are highest near the equator and decrease toward the poles. This hypothesis is based mainly on insect herbivory that occurs during the summer. Mammalian herbivory in the winter is a more likely driver of plant defense levels in northern latitudes. Early successional trees such as birches are favored by fire and provide an important food source for mammals like snowshoe hares. In order to test the Latitudinal Defense Hypothesis, we collected birch seeds from eight locations in northwestern Canada and grew seedlings in a common garden. We assessed levels of defense by counting resin glands because resin glands are negatively correlated with snowshoe hare preference. This research will provide valuable information regarding the biogeography of defense and address the role of fire in plant-mammal interactions on a continental scale.

THE BIOACCUMULATION OF HEAVY METALS IN AMPHIBIANS FROM GREAT LAKES ECOSYSTEMS

Dominic Burks and Jackson Gross (Mentor), Wildlife Ecology

For the past decade amphibian populations have been declining. We hypothesize that amphibians bioaccumulate heavy metals at environmentally relevant concentrations in both a field and laboratory setting. Laboratory experiments chronically exposed northern leopard frog tadpoles and adults to heavy metals. Tadpoles through metamorphosis were exposed to five metals (3 doses per metal for lead nitrate (Pb), cadmium chloride (Cd), chromium trioxide, copper sulfate, and sodium arsenate). Adults were oral exposed via crickets to two doses of Cd and Pb. Field studies collected leopard and green frog metamorphs from four sites at Horicon National Wildlife Refuge. Whole body and egg masses were analyzed via ICP-MS. Our study will address the question of whether amphibians are sufficiently protected in great lakes ecosystems.

OPTIMIZING MAGNETIC SHIELDING FOR USE IN A MINIATURE ADIABATIC DEMAGNETIZATION REFRIGERATOR

Benjamin Cain and Peter Timbie (Mentor), Physics

We are designing a miniature adiabatic demagnetization refrigerator (MADR) that cools from a 5K reservoir down to 50 mK. Cooling is achieved using a series of paramagnetic salt pills and magnetoresistive heat switches that thermally isolate the pills in sequence. Our MADR design requires several magnets, and shielding these magnets is crucial. In this project I investigate a multi-layered shield system consisting of two layers of high permeability metals, and a thin superconducting outer layer, such as lead. I hope to minimize both the amount of stray field outside the shields as well as the shield's size and mass by using different materials. Specifics of the shield's design are motivated by numerical computer simulations and experimental results in order to utilize each shielding material optimally.

MODELING THE VIBRATORY CHARACTERISTICS OF VOCAL FOLD SCARRING

Margie Callahan and Yu Zhang, Jack Jiang (Mentors), Surgery

Vocal fold scarring affects speech in many ways. People may notice vocal fatigue, lack of volume, hoarseness, raspiness, breathiness, voice breaks, and increased effort in vocalization. Measurements of vocal fold vibrations are important to understand how bad the scarring is, and the level of improvement after treatment. By studying vocal fold tissue and mass changes associated with scarring (stiffness, mass change, tissue change, acidity, etc.), we should gain a better understanding of normal and abnormal phonation of vocal fold scars. A computer model is being created to assist with the analysis of different aspects of scarring phonation when they are manipulated. The reduced amplitude and irregular pattern of vibration from incomplete vocal closure are reproduced in this model. Therefore, we hope to gain a greater understanding of how different characteristics of vocal fold scarring affect phonation.

SEARCHING FOR HIGH-ENERGY MUONIC NEUTRINOS FROM GAMMA-RAY BURSTS

Alexander Carver and Robert Morse (Mentor), Physics

Neutrino-based astronomy provides a new window on the most energetic processes in the universe. The discovery of high-energy ($\sim 10^{14}$ eV) muonic neutrinos from gamma-ray bursts (GRBs) would confirm hadronic acceleration in the relativistic GRB wind, validate the phenomenology of the fireball model, and possibly reveal an acceleration mechanism for the highest energy cosmic rays. The Antarctic Muon and Neutrino Detector Array (AMANDA) is an array of photomultiplier tubes buried deep within the ice at the geographic South Pole. Together these photomultiplier tubes make the world's largest operational neutrino telescope. This analysis searches for high-energy muonic neutrinos from GRBs. The techniques developed in this analysis will be applied to the data sets of more sensitive instruments such as Swift and IceCube.

FAMILY RELATIONSHIPS AND CHILDREN'S PARTICIPATION IN HEALTH RISK BEHAVIOR

Gabus Cassandra, Lisa Farwell and Susan Riesch (Mentor), Research

The purpose of this project is to reduce health risk behaviors among youth who transition from elementary to middle school. Health risk behaviors are activities that contribute to intentional and unintentional injury; alcohol, tobacco, and other drug use; sexual activity; nutrition; exercise; and sleep habits. Families in the intervention group attend a 7-week session of the Strengthening Families Program, which is a science and theory based program shown in national studies to reduce alcohol and other drug use, while those in the control group do not. All families participate in 3 'in-home' interviews over a period of 8 months. PDAs, laptop computers, and brief video recordings are used to collect data on aspects of family relationships, health risk behavior, and parent-child problem solving.

OXIDATIVE COUPLING OF SULFA DRUGS WITH SOIL CONSTITUENTS

Alex Castillo and Joel Pedersen, Heidi Bialk (Mentors), Soil Science

Sulfonamide antibiotics are among the top 200 prescribed human pharmaceuticals in treating urinary tract infections. Sulfonamides are also extensively used in veterinary practices, entering soil and subsurface environments via the disposal of animal and human wastes. Their introduction into the environment causes the proliferation of antibiotic resistant pathogens. Therefore, the overall fate and behavior of these compounds in soil must be determined. Several literature reports have suggested the oxidative formation of bound residues in soil thereby resulting in contaminant immobilization and detoxification. To further investigate these oxidative coupling reactions, sulfamethazine (SMZ) and sulfamethoxazole (SMX) were incubated with soil constituents while in the presence of a phenoloxidase or manganese dioxide (%-MnO₂). Significant reductions in SMZ and SMX occurred, suggesting potential sulfonamide immobilization and detoxification in soils.

DIAMONDS IN THE ROUGH

Regina Chagolla and Carole H. L. Hsiao (Mentor), Curriculum and Instruction

“Having a thirteen year old in the family is like having a general-admission ticket to the movies, radio, and TV. You get to understand that the glittering new arts of our civilization are directed to the teenagers, and by their suffrage, they stand or fall.” -Max Lerner Through the mechanisms of art and popular culture, this study examines the lives of adolescent girls. “Diamonds in the Rough” is a year-long ethnography that chronicles the importance of the arts and popular culture in the education of minority young women from a low income neighborhood. This study has been designed to show that young people do not often have the opportunity to express what they know about themselves and about society in the traditional classroom.

GENETICS OF BONE STRENGTH IN MICE

Andrew Chang and Robert Blank (Mentor), Endocrinology

Fractures are an important health problem. The causes of a fracture are dependent on the strength of the bone and the load to which it is subjected. Previous studies show that different strains of inbred mice express distinct bone properties, while also harboring different alleles at many different genetic loci. By breeding mice with differing bone properties we can relate various bone phenotypes to animal genotype. The genotypes of the mice are determined by microsatellites. The phenotypes include measures of biomechanical performance, bone size, bone mineral content, and animal size. Data analysis relies primarily on linear regression. Several loci show statistically significant evidence of linkage and association with bone phenotypes. The next step in this work is to isolate and identify the responsible genes.

INVESTIGATION OF ZN²⁺-BINDING DOMAIN IN RECQ HOMO-OLIGOMERIZATION

Chia-Wei Chang and James Keck (Mentor), Biomolecular Chemistry

RecQ family helicases play important but poorly defined roles in DNA replication, recombination, and repair. Mutations within human recQ genes result in severe genomic instability, leading to Bloom's, Werner's, or Rothmund-Thompson syndromes. There is a Zn²⁺-binding motif within the RecQ protein whose role in RecQ reactions remains poorly defined. Mutations of conserved residues within the Zn²⁺-binding domain (ZBD) have been identified in Bloom's syndrome patients. My research will focus on a possible role for the ZBD in driving RecQ oligomerization using an in vitro assay. It has been shown that a dead mutant of *E. coli* RecQ acts in a dominant-negative fashion over wildtype RecQ in vitro, suggesting that RecQ might oligomerize to function as a DNA helicase. I will test my hypothesis that the ZBD could play a role in RecQ oligomerization by mutating Zn²⁺-binding residues in the dominant-negative variant and testing whether the protein can still inhibit the function of wildtype RecQ.

THE EFFECT OF HRV-16 EXPOSURE ON THE EXPRESSION OF SELECT PROTEINS IN THP-1 CELLS

Elizabeth Chapman and Paul Bertics (Mentor), Biomolecular Chemistry

According to the National Institute of Health, asthma affects 17 million Americans, and each year, more than 500,000 Americans are hospitalized and more than 5,000 Americans die as a result of the disease. Acute asthma attacks result from airway inflammation and cause breathing difficulties (NIAID 2001). Current research shows that virally infected cells of monocytic lineage may contribute to this inflammatory response. To better understand this relationship, I have examined portions of the signaling pathways in THP1 cells upon stimulation with human rhinovirus 16 (HRV16), focusing on CREB, COX-2, and p38 proteins. A more intimate knowledge of how these proteins are affected in response to HRV16 could lend itself not only to understanding the pathology of asthma but also to finding potential therapeutic targets.

HITTING HOME RUNS WITH SPONSORSHIP AND BASEBALL

Samantha Cherney and Michelle Nelson (Mentor), Journalism & Mass
Communication

The purpose of this thesis is to understand how corporate/brand sponsorship functions in professional baseball. A content analysis of brand content within a Brewer-Cardinal game was conducted; more than 100 brands were seen or heard within the game. Most of the brands appeared as background signs in the fifth inning when both teams were rallying. The most frequent brands were self-promotion: Miller beer and Fox Sports Network. The game was at the sponsor's namesake — Miller Park and was televised by Fox. Interviews with sponsors, baseball organizations, and fans were performed to gauge their views of sponsorship. Other research included focus groups where emphasis was placed on perceived effectiveness and effects, and also a literature review to provide a background of research relating to this study.

QUANTIFICATION OF PHOSPHOLIPASE D IN PRENEOPLASTIC CELLS

Poh Hui Chia and Jamey Weichert (Mentor), Radiology

NM404, a radioiodinated phospholipid ether analog imaging agent, is selectively retained by malignant tumors but not benign tumors. NM404 is a likely substrate for Phospholipase D (PLD). PLD catalyzes the hydrolysis of phosphatidylcholine to phosphatidic acid and choline. Dysregulation of PLD activity occurs in many tumors. Tumorigenesis is tumor progression initiated when cells escape homeostatic control of cell proliferation resulting in an adenoma. Continued progression leads to hyperplasia (precancer), with further changes resulting in neoplasia and often invasion of other tissues by metastatic cancer. This project seeks to relate retention of NM404 to tumorigenesis by determination of PLD levels in preneoplastic cells. Benign tumors and normal tissues are obtained from mice for analysis with the Amplex Red assay. PLD activity is determined spectrophotometrically by conversion of Amplex Red to resorufin in an enzymatic fluorescence assay.

THE RELATIONSHIP BETWEEN CHRONIC SALT LOADING AND 5HT RECEPTOR EXPRESSION IN RAT HYPOTHALAMUS

Andrew Clark and Mark Brownfield (Mentor), Comparative Biosciences

This study examined changes in serotonin (5HT) receptor expression in rat hypothalamus due to chronic salt loading. It complements a study demonstrating that chronic salt loading increases hypothalamic vasopressin (VP) secretion in parallel with increased 5HT synthesis and release in neurons projecting to the hypothalamus. Rats were administered 2% sodium chloride drinking water for 0, 2, and 4 days, anesthetized, and perfused with fixative. Hypothalamic tissue was sectioned and immunostained using purified antibodies against 5HT1a, 5HT2a, 5HT2c, 5HT5a, and 5HT7 receptors and the nuclear transduction factor c-Fos. Results show increased selective 5HT receptor expression in activated VP neurons as the number of days of salt loading increased. This finding shows that VP neurons are responsive to elevated 5HT in due to salt loading.

MOTION REPULSION IN THE VISUAL NEURONS OF RHESUS MONKEYS

Asia Comeau and Alexander Grunewald (Mentor), Psychology

Motion repulsion, an illusion that seems to increase the angle between two directions of movement, is an important trend for the study of vision. It is caused by a mistaken perception — how the brain interprets a visual stimulus, as opposed to the true display. We are studying motion repulsion in the neurons of rhesus monkeys. Motion perception is a central aspect of vision that is not fully understood. We want to find out where in the brain a flawed perception occurs, so as to better comprehend motion perception. The new test for motion repulsion records neural activity in MT (a visual area of the brain) as the monkeys watch populations of dots on a TV screen. The dots will either move together or in two different directions. We hypothesize that a misreading of the stimulus occurs at or before MT, so we expect to find a difference between the perceptions of one and two directions of motion. This experiment will help us learn more about the representation of vision in the brain.

FOSTERING H.O.P.E.: HELPING OVERCOME POVERTY THROUGH EDUCATION FOR TEEN MOMS

Angela Cunningham and Sherrill Sellers (Mentor), Social Work

This program was designed to address the prevalent issues of teen parenthood and poverty. The idea was to introduce and reinforce the importance of obtaining a post secondary education to teen mothers in their junior or senior year of high school. The program ran for eight weeks during the summer of 2003. Participants met once a week to participate in group building activities, get insights to what it will take to finish school, and receive information on services that are available to help them along the way. The young women also had the opportunity to tour the UW and MATC campuses. The participants walked away from the program with a sense of hope that they are able to pursue their dreams despite their difficult situations.

UNDERSTANDING THE DEVELOPMENT OF MIDDLE SCHOOL STUDENTS' MATHEMATICAL REASONING (ALSO KNOWN AS PRO

Erran Daniels and Eric Knuth (Mentor), Curriculum and Instruction

Proof is central to the discipline of mathematics and its practice. The purpose of this study is to trace the development of middle school (grades 6–8) students, competence in justifying and proving and to identify conditions that influence that development. This study will follow a group of 6th grade students through the completion of 8th grade, using written assessments, semi- structured interviews, and classroom observations to document and analyze changes in their competencies and to understand classroom practice that influence these changes. The research objectives of this project are: to understand the development of students, competencies in justifying and proving; and to understand the conditions and pedagogy necessary to promote the development of those competencies.

NUTRITIONAL HEALTH OF HOMEBOUND ELDERLY

Vicktoria Danilova and Linda Baumann (Mentor), Nursing

The purpose of this project was to enhance the nutritional health and quality of life (QOL) of the homebound elderly population. Physiological, psychological and social changes accompanying aging decrease the appreciation derived from food and interfere with appetite and good nutrition. As a consequence, the QOL in this socially isolated community also declines. I worked with the “Meals on Wheels” program of Home Health United. It serves daily meals to about 300 clients; 75% of them older than age 65. To assess needs and knowledge of the community we first distributed a questionnaire on nutrition-related issues. Our intervention was a production of educational materials: monthly nutritional pages on the back of menus and quarterly newsletters “Happy Meals on Wheels”. To evaluate the impact of the project we sent a survey to all 300 clients. The results from the 90 surveys returned will be discussed and taken into consideration during future production of educational materials.

THE ROLE OF AMERICAN MUSIC, MUSICIANS AND MUSICOLOGISTS IN RAISING HIV/AIDS AWARENESS

Lauren Date and Matthew Tift (Mentor), Musicology

AIDS, which is caused by the HIV virus, has killed millions around the world since the early 1980s. There is still no cure for AIDS, and the epidemic continues to rage on as thousands of new HIV cases are reported each year in the United States alone. Since it began to gain social recognition and acceptance in the 1990s, the subject of AIDS has appeared more frequently in popular music. Music can be a powerful tool for conveying an idea to a large group of people, and many American musicians have utilized their popularity to raise awareness for HIV/AIDS. Although music cannot directly stop the spread of AIDS, musicians can help raise awareness for the disease and consequently reduce the number of new HIV infections.

TWO GOBY IMMIGRANTS: NEOGOBIUS MELANOSTOMUS AND PROTERORHINUS MARMORATUS IN THE GREAT LAKES

Naomi Delventhal and John Lyons, Sture Hansson (Mentors), Zoology

Gobies comprise one of the largest fish families with over 2,000 species, but none are native to the Great Lakes. In 1990, however, the Eurasian round goby (*Neogobius melanostomus*) was discovered in the St. Clair River. They spread quickly and have become locally abundant. Using museum specimens from different areas within the Great Lakes, my study focuses on the morphological variation of round gobies and the smaller tubenose goby (*Proterorhinus marmoratus*), also an invader from Eurasia. The results may help locate the origin of the invaders and determine whether our populations are morphologically distinct due to “founder effect” or different environmental conditions (e.g. salinity).

BLIND CONSTRUCTION: MIXED MEDIA

Diana Dewi, Jennifer Kittleson and Wendy Hagedorn (Mentor), Apparel and Textile Design

The basis of this project was to create a garment using mixed media in order to mimick the human body. The materials we used to create this piece include: buckram, copper wire, spray paint, fabric paint, a variety of novelty fabrics, and chains. The techniques we created in order to manipulate the piece include: fabric branding and burning, grid painting, sewing, drapping, molding buckram, and coiling. Our overall approach was to create a theatrical wearable art piece. Upon completion of the assignment we found the piece aesthetically pleasing because of the way it molds to the human body, but can be a piece all on its own.

CROCHETED METAL DRESS

Diana Dewi and Anna Stevens (Mentor), Apparel and Textile Design

Upon the initial creation of the metal beaded dress, I made a basic pattern by drapping on a dress form. The materials I used include double layered, thirty gauge copper wire and matte and translucent sead beads. I crocheted the entire dress using the pattern. The project covered an entire summer's worth of time. The combination of the copper wire and the variety of sead beads used created an aesthetically pleasing piece in which worked well with light and certain skin tones. The dress also drapped well on the human body because of the ruffles created by the increase in the number of loops per inch. The crocheted metal dress is heavy, but looks light and delicate because of the use of materials.

GOAL SETTING AND PERCEIVED VALUE'S EFFECT ON INTRINSIC MOTIVATION

Michael Diamond and Olga Godes (Mentor), Psychology

Our lab studies intrinsic motivation, the motivation to do something simply for the sake of enjoyment. Past research has shown that having both a goal and perceiving an activity as having practical value can increase intrinsic motivation, therefore improving performance. In our lab, participants learn a new technique for solving multiplication problems, and use this method to complete as many problems as possible. We manipulate whether the participants have a goal and whether they perceive the technique as having value for the future, for current everyday tasks, or aren't informed of its value. We expect these factors to affect participants' performance and interest. By understanding these effects, teachers, coaches, and any people who desire to improve others' motivation can better organize activities to do so.

ELECTRIC FIELD CHARACTERIZATION ON MICRO SCALE ELECTRODES

Jerry Ding and Dean Tompkins (Mentor), Civil and Environmental Engineering Department

This project characterizes pulsed electric fields produced and maintained between closely spaced, oppositely charged metal electrodes supported on a glass surface. Empirical results will be compared with simulation results obtained with the finite element method. The results from this study can be used to aid in the design of a specialized coating on Navy ship hulls to inhibit growth of microorganisms. Experiments are performed by generating a pulsed electric signal through the micro scale device using a function generator, and then mapping and measuring the resulting electric field distribution in the small space located between the oppositely charged electrodes. A finite element analysis will be performed using computer models to predict the electric field. Analysis of experimental data will potentially reveal important properties of the pulsed electric field that would be essential for inhibiting growth of microorganisms.

INFINITY AND IMPOSSIBILITY: HERMENEUTICS AT THE LIMIT

Daniel Dooghan and Max Statkiewicz (Mentor), Comparative Literature

In engaging a text, we traditionally seek to interpret it in order to extract a meaning from it. Yet in doing so we reaffirm the polysemous character of the text; a Marxist interpretation of a text might find a different meaning than that of a literal reading. Both of these are part of modern scholarship, but can we establish one as more valid than the other? Any attempt to claim that one reading has an immanent truth is to limit our understanding of the text. To gain a full understanding of a text, we must attempt all possible interpretations: an infinite and thus impossible task. How then are we to understand a text? If we acknowledge this impossibility and focus on the event of interpretation at this limit, we can approximate understanding. Interpretation is a creative process. The interpreter does not simply understand a text, but rather creatively re-presents it. This maintains the suppleness of the text that allows reinterpretation and preserves understanding's infinite nature.

MAXIMUM PERFORMANCE TASKS OF SPEECH AND FINE MOTOR WITH THE PRESCHOOL POPULATION

Julia Dorneanu and Nancy Potter (Mentor), Communicative Disorders

Young children, aged 3–5, with motor speech disorders such as dysarthria, may not be accurately diagnosed because there is an inadequate definition of normal in this age range. The purpose of this project is to determine speech characteristics of normal children. This study describes the performance of 50 normally developed children in the age range of 3–5.5 on spoken diadochokinetic (DDK) tasks. Its aim is to determine whether the older subjects (4–5.5 year olds) have an increased speaking rate due to increased syllable rate or decreased pause time between words. Furthermore, it is also meant to determine how a child's speaking ability develops over the course of 2 1/2 years. To achieve this aim, maximum performance tasks were administered consisting of a repetition of monosyllabic words such as toot, kick as well as multi-syllabic words such as buttercup, pataka. The results showed that the decrease in pause time increased a subject's speed more than the decrease in syllable rate.

VINTAGE FASHION REVISITED: THE CREATIVE PROCESS AND UNDERSTANDING DESIGN

Stephanie Draves, Katherine Wendelborn and Anna Stevens (Mentor), ETD

Working as a team, we designed a twelve garment clothing line inspired by vintage attire of the 1920's and 1930's. This project was modeled after the apparel industry, focusing on the entire design process from concept to creation. Our fashion collection was developed through practice-based research, combining aspects of this historical era's lifestyle, history, and dress with contemporary needs and trends. To best apply our research and test the viability of our collection, garment construction is now necessary. The level of success achieved by these designs can only be evaluated when they are seen as intended, existing and moving on a human figure. A planned event will showcase the collection along with an informative display that visually describes the entire research and design process.

THE EFFECT OF MODIFYING FAT TYPE AND CONTENT OF THE KETOGENIC DIET ON SEIZURE FREQUENCY

Simone Dustin and Carl Stafstrom (Mentor), Neurology

The ketogenic diet (KD) is a dietary treatment for epilepsy, consisting of a 4:1 ratio of fat to combined protein and carbohydrate. Although it has been clinically effective in treating children with epilepsy, the mechanism of action of the KD is unknown. In this study, we are modifying the KD's fat type and content to determine whether substituting saturated fat with omega-3 polyunsaturated fatty acid (n-3 PUFA) affects the KD's ability to retard epileptogenesis (the progression of seizures). We are intermittently monitoring the frequency of spontaneous seizures in epileptic rats given one of four dietary groups: 1) control 2) KD 3) PUFA control 4) PUFA KD. We hypothesize that altering the KD's fat content will affect seizure susceptibility. This study will increase the understanding of the KD's mode of action.

REPLENISHING MY INNER POTENTIAL IN SIN CHRONIC CITY. MY SECRET: DANCE, INSTEAD OF X

Nancy A. Dvorak and Claude Heintz (Mentor), Dance Program

It is no fluke that I came to UW Madison to take care of business—I'll explain why. I currently study health science, nutrition, and biology. I practice eating balanced, exercising mind and body, and therapy initiated thru all 5 senses. I've concluded that if we draw from many sources through life, we come to know our own source: true joy. In particular, a passion for dance has led me to believe that music is magic when used to uplift, it can replenish our energy system. So it's my unlocking potential that brings me to Madison to share a dance style I like to call freestyle fusion flow. This innovative dance form isn't a secret, but it's best for you to make sense of the blended rhythms, so I will withhold any solid description. I will perform a live improvisational piece by myself, to globally mixed music blending from over 20 different sources of movement (hip hop, yoga, capoeira, figure skating, salsa, etc.) I will expose a silent language in the collision of science and art.

DETERMINING THE ROLE OF Y18D10A.17 DURING CYTOKINESIS

Zachary Eggers and Jayne Squirrell (Mentor), Anatomy

Cytokinesis, the division of one cell into two, is a fundamental process that living organisms use for development and propagation. The Y18D10A.17 gene was identified using RNA interference (RNAi) to block the gene's function in *Caenorhabditis elegans*. When the Y18D10A.17 is depleted, cytokinesis fails. This gene's homology to the clathrin family of proteins suggests a link between the gene's function and endocytosis. I have been involved in studies to determine the role and localization of the Y18D10A.17 gene product in embryonic development of *C. elegans*. In addition to continuing the studies of this gene in the *C. elegans* embryo, an uncharacterized homologous gene (2700023B17Rik) in mouse embryonic stem cells is being analyzed to determine if the mouse gene product is functionally analogous to Y18D10A.17.

SPEECH AND LANGUAGE SKILLS OF POST INSTITUTIONALIZED CHILDREN

Andrew Eisenthal and Julia Evans (Mentor), Communicative Disorders

The purpose of this study is to investigate the speech and language skills of children who spent a part of their childhood in the low quality orphanages of Romania. The study seeks to find the relationship between the low level care the children received and their poor language and speech skills. The kids have exhibited problems in American schools with these skills. The children were given language, verbal, and intelligence quotient tests. These results are being analyzed against other children who have been diagnosed with speech and language impairments. The goal of the research is to pinpoint these children's specific impairments so as to find the relationship between their previous care and their speech and language abilities.

MARGARET C. ANDERSON'S LITTLE REVIEW

Sophia Estante and Lorrie Moore (Mentor), English

This research looks at the work of Margaret C. Anderson, the editor of the Little Review. The review published first works by Sherwood Anderson, James Joyce, Wyndham Lewis, and Ezra Pound. This research draws upon mostly primary sources including memoirs, published letters, and a complete collection of the Little Review. Most prior research on Anderson focuses on her connection to the famous writers and personalities that she published and associated with. This focus undermines her role as the dominate creative force behind one of the most influential little magazines published in the 20th Century. This case example shows how little magazine publishing is arguably a literary art.

TEMPLATE SYNTHESIS AND MAGNETIC MANIPULATION OF NICKEL NANOWIRES

Mohammed Farhoud and Arthur Ellis (Mentor), Chemistry

In this experiment the growing world of nanotechnology is brought to the classroom. Nickel nanowires are created by electrodeposition of a nickel salt solution and a AA battery to fill the 200 nm-diameter pores of an alumina membrane. The nanowires, which are up to ~50 mm long, can be liberated from the membrane by dissolving the alumina template with sodium hydroxide. Suspensions of nanowires on a microscope slide can be observed using a common compound microscope. The alignment and movement of the magnetic nanowires can be controlled manipulating the magnetic field surrounding the wires. Three courses across campus have incorporated the lab experiment: Chemistry 311, Materials Science and Engineering 361, and Physics 801. The students gain hands-on laboratory experience in nanotechnology, while learning about fundamental ideas from a variety of areas, including electrochemistry, magnetism, and materials science.

DESIGN 2004

Rachel Finch and David Wells (Mentor), Environment, Textiles, and Design

Design 2004 is the annual juried exhibition of student work from the Department of Environment, Textiles, and Design in the School of Human Ecology. The exhibit includes interior design projects, apparel, textile design, fiber art and foundation designs completed since January 2003. Design 2004 opens with a reception from 11:30am until 1:30pm on Friday, April 16th and continues through May 9th. The Design Gallery is located in the Human Ecology Building, 1300 Linden Drive, Room 70. Gallery hours are 11 to 4, Tuesday through Friday, and 1 to 4 on Sunday. Design Gallery student representatives will be present to distribute announcements and invite other students to attend Design 2004.

MORE THAN S.A.A.M. PROMOTING SEXUAL ASSAULT AWARENESS THROUGH COALITION BUILDING

Elizabeth Finesilver, Tamara Zec and Pamela Oliver (Mentor), Sociology

Communities need to be involved in helping to end sexual violence. A part of Community Scholars Program, this project's goal is to build a coalition of agencies in Dane County joining with the Rape Crisis Center in recognizing Sexual Assault Awareness Month (SAAM), April 2004. We are strengthening networks of agencies already working to end sexual violence as well as inviting other groups to support the cause. At coalition meetings, which take place monthly, groups share resources and plan events to inform diverse populations of sexual assault. SAAM posters, advertising coalition members and SAAM events are distributed through the coalition. The coalition's important work will continue throughout the upcoming year. Because of this project, more people are involved with putting an end to sexual violence.

“THE IMPACT OF LIGHTED BODIES”: THE BODY IN MINA LOY’S POETICS

Margaret Fink and Cyrena Pondrom (Mentor), English

Mina Loy was a modernist poet and painter who shocked her contemporaries with somatically frank, anti-romantic subject matter and language liberated from grammatical norms. While mentioned often in scholarly work that treats her contemporaries, it is only within the last few decades that her own life and work have been subject to academic scrutiny. This project contributes to this growing body of inquiry, drawing heavily on archival research done at Yale’s Beinecke Rare Book and Manuscript library. It examines Mina Loy’s work in terms of the bodies that populate them, considering the cultural milieu in which Loy’s conceptions of the body formed. This analysis is informed by recent theoretical work concerning the body as a site for selfhood, in particular, Julia Kristeva’s notions of the abject and Margrit Shildrick’s postmodernist revisions of the Cartesian self/other, mind/body divide.

THE STORY OF AN ISLAND AND ME: A ROCKY TALE

Kate Flick and Nancy Langston (Mentor), History

This illustrated children’s book tells the tale of the catastrophic consequences human existence wrought on Easter Island. Told from the perspective of a rock, the story unfolds through time as the island was created, plants and animals flourished, humans came on boats, island life declined, and human civilization fell apart. Along the way, a friendship between tree and rock blossoms but eventually is destroyed much like the island itself. In this environmental tale, hope pervades and survives, however, as the story concludes with the gradual recovery of island life and the rock’s budding new camaraderie.

OPENING PANDORA'S BOX: THE COMPLEXITIES OF ROMAN INTELLECTUAL DEBT

Simon Ford and Victoria Pagan (Mentor), Classics

Traditional scholarship has established a monolithic conception of the indebtedness of Roman society to its Hellenic counterparts, a model dominated by the seemingly indiscriminate Romanization of Greek cultural and intellectual forms. This venerable truism, derives largely from the interpretation of poetry and fails to fill the vacuum created by broader historical and cultural analyses of Roman intellectual debt to Greek thought. By taking into account historical and rhetorical treatises, dating from approximately 168- 53 BC, the project hopes to provide a more nuanced understanding of the mechanism of exchange and its implication for the identities and anxieties of Greek and Roman societies during this period of Roman expansion.

UGANDA: CURRENT THEMES IN HEALTH AND NUTRITION

Kara Franke, Melissa Keller, Kelly Krueger, Dwayne Myal, Aliza Richman,
Christine Riley, Caitlin Stoltzmann and James Ntambi (Mentor),
Biochemistry

Uganda is a country of striking contrasts. Lush tropical landscapes provide the backdrop for a rich culture plagued by disease, by hunger, and by both economic and political strife. While on a three week study in Uganda, these issues were very apparent. Diseases like HIV/AIDS, tuberculosis, and malaria as well as other health problems like malnutrition are part of everyday life in Uganda. While these public health problems are widespread in the population, children are most commonly affected. The focus of this project is to educate our faculty and peers about these health problems and how they are entwined in socioeconomic and political facets of the Ugandan culture.

REACH OUT AND READ: IMPROVING LITERACY IN UNDERSERVED CHILDREN OF MADISON

Julia Frye and Sharon Younkin (Mentor), Family Medicine

“Reach Out and Read: Improving Literacy in Underserved Children of Madison” was an effort to support children’s language and literacy development. The Reach Out and Read (ROR) program trains physicians to talk with parents about the importance of reading to their children, provides free books at well child visits, and places volunteer readers in clinic waiting rooms to serve as role models for parents. I assisted in implementing ROR at two not-for-profit medical clinics supported by the UW Medical School’s Department of Family Medicine. These two clinics serve ethnically diverse and economically challenged populations on the South and East sides of Madison. I coordinated volunteer recruitment and scheduling, assisted with book donations and ordering, and evaluated the program’s success through book tracking forms and surveys.

THE CLONING OF THE RAF GENE IN PREVTRE

Miti Gandhi and Herb Chen (Mentor), Surgery

Carcinoid tumors are a rare type of gastrointestinal tumor. Carcinoid tumors are known to secrete excess amounts of neuroendocrine markers and cause certain adverse symptoms such as abdominal pain, flushing, and diarrhea. Our aim in the lab is to control the tumor growth and hormone secretion. We have reported earlier that the expression of Raf-1 in carcinoid cells reduces hormone levels. My project involves the cloning and screening of Raf-1 into an expression vector. After Raf-1 has been cloned, our lab plans to study the expression of the gene in cancer cells.

INNOVATIONS IN END OF LIFE CARE FOR ELDERERS

Diane Ganey and Betty Kramer (Mentor), School of Social Work

Inadequate care of the dying is emerging as a major concern in the United States among health care providers, educators, and policy makers. Far too many elders suffer from pain that practitioners could prevent or relieve. Understanding the elders' experiences, needs, and preferences of care as they approach death and how these compare to that of their family members has important implications for designing responsive comprehensive service systems to support them through their final days. The main objective of this study is to determine the congruence between older adults and their family members in terms of end-of-life care preferences, worries, and needs of the older adult and to also examine the role of the social worker in addressing the complex end-of-life care needs of elders with advanced chronic disease. My hope is that this knowledge will provide necessary tools to enhance the current end-of-life care.

ANALYSIS OF THE HIGH-THROUGHPUT APPROACH USED IN ASSESSING VASCULAR DEVELOPMENT IN THE MICE BRAIN

Dina Garcia and Gareth Lahvis (Mentor), Division of Plastic and Reconstructive Surgery

Vascular development affects tissue function, blood patterning and development of the brain. Mice brain vessels are stained using a perfusion based approach. The images are then collected by montage photography and evaluated by traditional and high-throughput approaches. In the high-throughput approach, stained capillaries are converted with computer software to exhibit consistent white pixel values while non-vessels are allotted black pixels. To evaluate this approach, various photographs are chosen, comparing the vessel densities using different morphometric techniques, with quantitation of segmented images.

IMPROVING HEALTH CARE OF THE HOMELESS

Jacqueline Gerhart and Murray Katcher (Mentor), Pediatrics

“Improving Health Care of the Homeless” is a collaborative approach to expanding and enhancing quality health care to Madison’s underserved communities, specifically at the Salvation Army Homeless Shelter Clinic, also called the MEDIC Clinic. The purpose of this study is to provide information to the Salvation Army and the MEDIC Clinic volunteers on how its services have impacted the Madison community over the past twelve years. This information will be provided by the creation and statistical analysis of electronic medical records. The results will reveal trends in medical problems, treatments, and referrals experienced by the homeless. With this information, the Clinic will be better equipped to discover new methods to improve health care and services to low-income people throughout Madison.

CHEMOPREVENTION OF SKIN CANCER

Amaninderapal Ghotra and Nihal Ahmad (Mentor), Dermatology

Chemoprevention by natural occurring agents such as resveratrol is a new method of treating skin cancer, a disease that affects millions of people each year worldwide. In this study, UVB exposed SKH-1 hairless mice treated with 0, 25 or 50 (10^{-6})M resveratrol before and after UVB-exposure were studied. After six months of treatment, skin samples of mice revealed significant tumor reduction in Resveratrol treated group. Both the pretreated group and the post-treated group showed tumor reduction suggesting resveratrol has systemic rather than sunscreen effects. Survivin, a protein, is present in cancer cells at a greater amount than in non-cancerous cells; however, Western blot, a technique used to study protein’s expression, showed survivin’s expression to be greatly reduced in Resveratrol treated group. Our study demonstrated that Resveratrol has strong chemopreventive effects against UVB exposure-mediated skin cancer by inhibiting survivin-pathways.

OUT OF EUROPE: HISTORY, MEMORY, AND EXILE SINCE 1945

Sophia Gillen and Keith Cohen (Mentor), Comparative Literature

In "Out of Europe: History, Memory, and Exile since 1945" I investigate the problems of accurately representing memories of the Jewish experience during World War II. Issues of collective and individual memory relate to the history of the Jewish religion, and there are many questions as to how the Jewish identity has transformed through time. My methods consist of readings about representations of the Holocaust and the participating in discussions on the subject. Through critically thinking about the distinctions of Jewish culture and connecting these qualities with historical events and media, one can further observe the difficulties in describing cultures. By reading literature post 1945 questions arise that bring up the importance of "writing after Auschwitz" and what this literature means. This project interrelates cultures' points of views on the Holocaust, and what has happened since these horrible events.

PREOPERATIVE PREPARATION FOR CHILDREN: USE OF RELAXATION AND DISTRACTION.

Kathleen Gorenc, Jenna Smith and Teresa Pellino (Mentor), School of Nursing

This research, currently being performed, concentrates on the preparation of children for surgery by the use of relaxation techniques to reduce the anxiety levels experienced before and after surgery. A tri-fold billboard will display the criteria for participating in the study, introductory information including current supporting research, experimental design and setup, the anticipated outcomes, and any results and conclusions that can be made at the time of the symposium. Illustrations of the step-by-step data collection, evaluation, and follow-up process and their implications will also be provided. This display should provide information specific to this research that is currently taking place at UW-Hospital, as well as a brief evaluation of the effectiveness and potential outcomes.

MEN AND WOMEN + SEX AND POWER X ALCOHOL=THE BAR SCENE

Amanda Gray and Beth Quinn (Mentor), sociology

Sexuality plays a major role in gender performance and the bar scene is a potential hotbed for the public display of sexuality. Sexual harassment is a particular way in which gender is acted out, and, therefore, may contribute to behaviors attributed to gender performance. Bar-employees cope with working in a sexualized work environment where potentially harassing behavior is not recognized as such. I will focus on ways that bar employees, both men and women, contribute to the public display of gender and sexuality, as well as the ways in which they define and label behaviors that may be deemed permissible in their workplace, but are unacceptable in other contexts. Based on interviews and continuous observational study, I intend to show how bar employees reproduce specific gender scripts in accordance with the dominant societal definitions of masculinity, femininity, and sexuality, and the power relations between all three, which contribute to potentially harassing behavior.

WISCONSIN SCIENCE JOURNAL PROJECT

Kavneet Jessie Grewal and David Hatfield (Mentor), Educational Psychology

“Hands-on” [science] activities, while essential, are not enough. Students must have “minds-on” experiences as well óNational Science Education Standards (National Research Council, 1995) The goal of this educational research project is to understand how young people develop interest in science and technology by practicing science journalism. Specifically, middle school students in an out-of-school workshop using custom-designed web-based journalism software will create an online science newspaper. The research focuses on how the young people’s interest in science and technology and skills in journalistic thinking changed from the beginning to the end. My responsibilities will include gathering data, assisting students during the workshop, pursuing journalistic and psychological knowledge of interest through other resources and grasping knowledge of how a research study is conducted.

COMPARING GENE EXPRESSION IN BCG INDUCED GRANULOMA FORMATION

Amy Grovender and Laura Hogan (Mentor), Pathology and Laboratory Science

This research studies differences in gene expression of Mycobacterium bovis bacilli Calmette Guerin (BCG) induced granulomas (localized inflammatory structures). The infected mice are deficient in recombinase activating gene function and therefore lack all natural B and T cells. The BCG infected mice are also transgenic for a rearranged T cell receptor (TCR) gene, 5C.C7, which does not recognize any of the proteins in the wild-type BCG but recognizes Pigeon Cytochrome C (PCC). Previously in the lab, transgenic mice were infected with both the wtBCG (non-specific recognition) and the recombinant BCG containing PCC (specific recognition). RNA isolated from the granuloma preps was used to make cDNA to probe a pair of Gene Arrays of mouse genes. The two arrays showed that 40/1000 genes were expressed significantly higher with the recombinant infection. I am using RT-PCR and real time PCR to confirm the gene expression differences of the two different types of infection.

IDENTIFYING THE OPTIMAL HABITAT FOR EARTHWORMS IN A CLASSROOM ENVIRONMENT

Matthew Guarascio and Gary Lake (Mentor), Life Sciences Communication

We are investigating the optimal conditions for earthworm (*Lumbricus terrestris*) survival in a classroom environment where temperature varies from 16 °C to 23 °C. Our results will aid teachers who use earthworms in the classroom. Currently a 28 cm by 16.5 cm by 12.5 cm plastic container with 10 cm of commercially available soil mix is the standard habitat. This habitat will be the control. Treatments of soil depth, ice packs and ice to control temperature, and polystyrene containers to provide insulation will be used to create varying habitats. Soil temperature will be recorded every five days and growth and abundance will be monitored every fifteen days. Survival and growth rate will determine the optimal conditions to keep worms alive in a classroom environment.

PROVING THE UPTAKE MECHANISM OF THE COMPUTED TOMOGRAPHY IMAGING CONTRAST AGENT ITG

Melissa Haehn and Jamey Weichert (Mentor), Department of Radiology

The aim of this research is to directly prove that the uptake of a biomimetic computed tomography imaging contrast agent (ITG) is delayed or severely diminished in mice genetically-engineered to be lacking ApoE, a specific lipid transport protein. This contrast agent is one which, when injected into the mouse, is intended to be taken up and metabolized selectively by hepatocytes and not tumor cells located within the liver. Apo-E, which is attached to the surface of the contrast agent acts like a zip code to deliver the agent selectively to hepatocytes via a receptor mediated mechanism. Experiments are performed by injecting the genetically-engineered and control mice with the contrast agent and scanning them on a high resolution microCT scanner at predetermined intervals. Initial results indicate a drastic delay in hepatocyte uptake of the agent in these mice, thus proving that the mechanism of this first cell-selective CT contrast agent is apo-E mediated.

TOPOISOMERASE GENE EXPRESSION IN PATIENTS RECEIVING MITOMYCIN-C AND IRINOTECAN

Courtney Hallahan and Jill Kolesar (Mentor), Pharmacy

Gastric and esophageal cancers are significant causes of cancer mortality in the world. Currently, the prognosis of patients diagnosed is poor, with median survival of 3–9 months. This indicates a clear need for more effective treatments. The goal of this study is to enhance the effectiveness of irinotecan, a topoisomerase I inhibitor, by pretreating patients with a dose of mitomycin-c known from in vitro models to induce topoisomerase I. Topoisomerase is an enzyme that cuts DNA before replication. The irinotecan binds to topoisomerase, terminating replication thus preventing proliferation of cancer cells. To measure efficacy, RNA from patients receiving the chemotherapy was amplified using PCR. The Topo I gene expression will then be calculated.

IDENTIFICATION OF CANCER-TESTIS ANTIGENS USING SEREX

Kimberly Hammond and Douglas McNeel (Mentor), Medical Oncology

Prostate cancer is a significant health problem, and one of the possible methods being explored for prevention of it is vaccines. My project is to identify the Cancer-Testis antigens that are present in two individual patients with prostate cancer. To do this I use the SEREX (serological identification of antigens by recombinant expression cloning) method to identify immunologically recognized proteins that can be potential cytolytic T-cell antigens. To date, I have found two potential antigens, on which I will do further work to purify and sequence. These antigens represent possible targets for vaccines or other molecularly targeted therapies for prostate cancer.

DEVELOPING A NEW METHOD OF PARENTAGE IDENTIFICATION IN DAIRY CATTLE

Colin Harrison and Hasan Khatib (Mentor), Dairy Science

In dairy cattle progeny testing is the method of choice for improving productive and reproductive traits. Accurate parentage information is of significant importance for the estimation of the genetic values of the animals. Over the past years, different types of markers were used in paternity testing, but recently the use of DNA markers has provided a more accurate method of identifying individuals. Recent advances in genome sequencing projects and bioinformatics have facilitated the identification of single nucleotide polymorphisms (SNPs). Due to their polymorphism in population, SNPs can be used as genetic markers. The goal of my project is to develop methods for parentage testing in dairy cattle using SNPs. DNA will be extracted from semen samples from Bulls and their sons. By using the polymerase chain reaction (PCR) and sequencing methods, we will be able to develop SNPs in different genes to dramatically cut down the cost of parentage identification tests for the dairy industry.

ACTION RESEARCH AND THE REFORM OF TEACHING AND TEACHER EDUCATION IN NAMIBIA

Aisha Harun and Kenneth Zeichner (Mentor), C&I

This project seeks to observe the effects of teaching reform, which emphasizes a more learner-centered teaching policy, in the recently liberated and post-Apartheid south African country of Namibia. To determine whether or not the Namibian educational systems are indeed more democratic (with the increased participation of students in their own learning process), the project members have reviewed findings provided by both the project team itself and the BETD, a post-independence national teacher education program for educators in grades 1–10. I have sought after relevant research materials to facilitate a comparison between the Namibian educational reforms and those found in other African countries. We hope to notice a transition from a very autocratic educational system to one that is more democratic.

“A MEETING IN THE DARK” AND MIXED MESSAGES

Amy Heckendorf and Akua Sarr (Mentor), African Languages and Literature

The story, “A Meeting in the Dark” by Ngugi wa Thiong’o brought to my attention the topic of interracial and interfaith marriages. In this story, a Christian boy named John ends up killing his pregnant girlfriend because he cannot stand to be shamed by her lack of education and her lack of Christian faith. It is this clash of cultures that is intriguing and it is this historical theme of mixing and cleansing ethnicities through marriage that I wish to explore as a part of the African Literature and Language 201 group. Whether the end result is Mexico, a culture based in mixed children, the United States, a place where nearly 100% of marriages stay along color lines, or Africa, where the condition is still being written, it is important to educate ourselves on the cultures in and around us. They call the United States a melting pot, but perhaps there is not so much melting after all.

THE HMONG WRITING SYSTEMS

Yeng Her and Marlys Macken (Mentor), Linguistic

My research is the Hmong writing systems. The purpose of this research is to develop and understand why the majority of Hmong people prefer to use the Romanized Phonetic Alphabet (RPA) over the Pahawd Writing System. To try to explain this preference, I interviewed three Hmong people who only know the RPA Writing System, three Hmong people who only know the Pahawd Writing System, and three who knows both. I have come to the conclusion that Hmong people prefer the RPA Writing System over the Pahawd Writing System because of two reasons. The first reason is that the RPA Writing System is more convenient to use because of technology (computers and keyboards) and the larger amount of people who know how to use it. The second reason is the RPA is more accepted by the Hmong community to be taught anywhere.

THE COMMEMORATION AND MEMORIALIZATION OF THE AMERICAN REVOLUTION

Benjamin Herman and Jean Lee (Mentor), History

This project involves discovering how the American Revolution was remembered during the nineteenth century. The goal is to show that the American Revolution was memorialized by the actions of the United States government during the 1800s. This has been done by examining events such as the Supreme Court cases of John Marshall and the Nullification Crisis. Upon examination of these events, it becomes clear that John Marshall and John Calhoun (creator of the Doctrine of Nullification) attempted to use the American Revolution to bolster their claims by citing speeches from Founding Fathers. Through showing that the American Revolution lives on in memory, this research highlights the importance of the revolution in shaping the actions of the United States government.

EFFECT OF RAD54 MUTATION ON THE REPAIR OF DNA BREAKS WITHIN 8 OR 168 BASE PAIR REPEATS IN DROSOPHILA

Chu Kwen Ho and Carlos Flores (Mentor), Genetics

My research project studied the effect of rad54 mutation on the choice of repair of DNA double-strand breaks (DSBs) flanked by 8 or 168 base pair (bp) repeats with template on the homolog in *Drosophila melanogaster*. DSBs on the 2nd chromosome were induced by mobilization of P-element transposons marked with the eye-color gene, white (w^*) with the source of transposase. The progeny of rad54 homozygote (okr/okr) and heterozygote (okr/+) carrying the P-element chromosome were screened for the loss of white expression (white versus red eye color), indicating the loss of the P-element. Polymerase chain reaction (PCR) tests and sequencing of DNA were used to analyze the repair products. The results showed that rad54 played a role in the DSB repair pathway of gene conversion, and the length of sequence repeats which flanked the breaks affected the choice of repair pathways.

MONITORING REACTIVE OXYGEN SPECIES LEVELS IN RETINAL GANGLION CELLS AFTER AXOTOMY

Mark Hoegger and Leonard Levin (Mentor), Ophthalmology and Visual Sciences

Retinal ganglion cells are the source of fibers which connect the retina to the brain. The Levin laboratory has shown that there is an increase in the intracellular level of the reactive oxygen species superoxide anion (O_2^-) after their axon is severed. My research involves finding the source of this rise in O_2^- . I use fluorescent imaging techniques to monitor the levels of O_2^- in retinal ganglion cells. One possibility is that the mitochondrial electron transport chain is a source of reactive oxygen species after optic nerve transection, but there are other potential sources. I have been using chemical inhibitors of these sources to determine the source of reactive oxygen species after axotomy.

THE SPINNAKER

Andrea Hofer and Mark Nelson (Mentor), ETD

While the city of Madison has a lot to offer in the area of cuisine, something is missing. Madison could use a delectable, sophisticated seafood restaurant offering only the finest seafood dishes. The Spinnaker, a two level space on Main Street in downtown Madison would cater to both visiting and local seafood connoisseurs in search of fresh fish. This upscale eatery has more than dining to offer its guests. The upper level is not only conducive to dining, but also to entertainment. A stage provides an area for musical entertainment on a nightly basis. Located next to the stage is a full bar made of a ship's hull. The Spinnaker will momentarily draws one out of Madison and place them in a small town off the upper east coast.

URINARY SYSTEM MALFORMATIONS AND THE STILLBORN: A POPULATION-BASED STUDY

Kristi Hoffman and Richard Pauli (Mentor), Medical Genetics

The frequency and character of urinary system anomalies in a large population of stillborns is reported here. Among 1,467 referred stillborns to the Wisconsin Stillbirth Service Program 4% (61/1467) had urinary system malformations. Renal agenesis was the most frequent anomaly, representing 25% of stillbirths with a urinary system malformation. Stillborns with urinary tract abnormalities died primarily (72%) as a result of a syndrome or sequence. Mechanism of death was not easily defined and was most often postulated as cardiac failure secondary to abnormal fluid compartmentalization. Non-random association of urinary tract malformations with anomalies of other organ systems was limited to the reproductive, gastrointestinal/abdomen, and respiratory systems. Urinary tract malformations of roughly 10% of stillborns were found incidentally, reaffirming the utility of postmortem examination in stillborns.

EF4 IS A REPRESSOR OF FLOWERING IN ARABIDOPSIS THALIANA

Lewis Hong and Richard Amasino (Mentor), Biochemistry

The change from vegetative growth to reproductive growth is an important transition in a plant's life cycle. This transition must be tightly regulated to ensure proper timing for maximum seed production. Many of the known flowering time genes can be classified into several groups based on the signals to which they respond. The photoperiod pathway includes genes which are involved in the response to daylength; the vernalization pathway genes respond to cold; and genes in the autonomous pathway respond to signals within a plant. To identify more genes involved in the transition to flowering, a population of Arabidopsis was mutagenized with an activation tagging T-DNA vector and screened for plants with altered flowering times. *ef4* was pulled out of a screen for plants that flower early in short days. *ef4* was found to flower early in both short and long days. In this study, we examined the effect the *ef4* mutation has in combination with other late flowering Arabidopsis mutants.

DICHOTIC WORD LISTENING TEST PILOT STUDY

Noel Howlett and Diane Gooding (Mentor), Psychology

This study seeks to establish local norms of performance on the Dichotic Word Listening Test (DWLT) for future comparison to specialized populations. After completing a questionnaire, participants are exposed to auditory stimuli of two words simultaneously through headphones. They are asked to repeat as many of the words as possible. Scores are recorded based on the number of words participants correctly repeat from each the right and left channel. Participant performance on the DWLT is believed to directly reflect characteristics of brain laterality. This familiarization will serve to show that variations in the scores of members of specialized populations who will later take the DWLT, are in fact due to membership to such populations, not a result of experimenter error. At this stage of the experiment, RA's have run approximately 200 participants on the DWLT, and the data from them has been entered.

JOVENES “CRESCENDO” POR MUSICA (YOUTH GROWING THROUGH MUSIC)

Anne Jaspers and Sandy Magana (Mentor), Social Work

Jovenes Crescendo por Musica, a joint project between Catholic Charities, Professor Magana and myself, created a support group that used music to build the confidence of area Latino children. Through group music lessons, reflective journaling sessions and several performances, we provided the 16 participants with achievable experiences, demonstrated each child's potential and worth, and showed that one can achieve the goals he sets for himself. To evaluate the experience, I used written surveys, conducted a focus group, and based an analysis of the program on group work methodology. With the realization that everyone is an amazingly talented and unique individual, it is our hope that the children will continue to grow as people and artists in the years to come.

EVALUATION OF ITG IN A DIFFUSE MOUSE LIVER MODEL

Amy Jolly and Jamey Weichert (Mentor), Radiology

ITG is a hepatocyte selective CT contrast agent utilized in tumor detection. In our study we are trying to establish if a diffuse liver disease, namely cirrhosis, interferes with the ability of ITG to detect tumors in the liver. We induced liver cirrhosis with several injections of carbon tetrachloride. Our injections lasted for a duration of 4 weeks. The results thus far from the histology reports show an end point of fibrosis however rather than the desired cirrhosis. The CT images obtained thus far were unremarkable relative to normal control mice. We are going to further the study by increasing the duration of the dose so that the results show an end point of cirrhosis. We can then further it along by implanting the tumors into the liver.

INVESTIGATION OF THE EFFECTS OF HYALURONIC ACID ON VOCAL FOLD WOUND HEALING IN A CANINE MODEL

Angela Karls and Bernard Rousseau (Mentor), Communicative Disorders

The purpose of this research is to investigate the effects of Hyaluronic Acid (HA) on vocal fold wound healing. The vocal fold is the vibrating portion in the larynx that creates sound. If injured, the damage can lead to a voice disorder. Decreased HA levels and increased collagen may play a role in the viscoelastic tissue changes of the scarred vocal fold. These tissue changes may lead to impaired vibration and decreased vocal efficiency. The goal of this project is to test the effectiveness of HA in reducing vocal fold scarring and promoting wound healing. This research proposes to use measurements of vocal efficiency, histologic staining, and image analysis to determine the effects of HA on vocal fold wound healing two months after injury in a canine model.

ANAYLSIS OF “GIVE ME A CHANCE” BY M. NHLAPO AND RELATION TO THE SOCIAL STATUS OF WOMEN IN LESOTHO.

Paul Kauders and Akua Sarr (Mentor), Department of African Languages and Literature

“Under African Skies” by Charles Larson presents a collection of short stories. I have chosen to analyze “Give Me a Chance” by Mzamane Nhlapo. During this project, I will first present my claim that the text is predominately non-fiction. To support this, there will be an analysis of the fictional and non-fictional aspects of the story. Throughout this investigation, there will be frequent references to biographical information about Nhlapo to gain insight into the story. In addition, there will be a further analysis of the non-fictional aspects, specifically the representation of women and their social status in the country of Lesotho. This portrayal will be linked to factual accounts and information found in outside sources such as “Beyond Inequalities: Women in Lesotho” by Puleng Letuka and “This Matter of Women Is Getting Very Bad” by Marc Epprecht to further illustrate the accuracy of Nhlapo’s words.

CHARACTERIZATION OF PROTEINS INVOLVED IN TYPE IV SECRETION BY NESSERIA GONORRHOEAE

Megan Kiedrowski and Joseph Dillard (Mentor), Medical Microbiology and Immunology

Nesseria gonorrhoeae is responsible for the sexually transmitted disease gonorrhea, and my research focuses on the role of proteins in DNA secretion by this bacterium. *N. gonorrhoeae* secretes DNA for the purpose of antigenic variation, which allows the cells to change their surface molecules in order to avoid the host immune response. Secreted DNA also results in the spread of antibiotic resistance. I study two specific proteins, TraD and TraI. These proteins are predicted to be part of a Type IV Secretion System which pumps DNA out of the cell. TraI is expected to be involved in DNA processing. Through my research, I will characterize the functions of TraD and TraI in the secretion of DNA by *Nesseria gonorrhoeae*.

SKARE: AN ARCHAEOLOGICAL APPLICATION OF TWO REMOTE SENSING SURVEYS

Lynnette Kleinsasser and Sissel Schroeder (Mentor), Anthropology

Remote sensing surveys are not typically a feature of North American archaeological investigations, but they nevertheless have much to offer to the archaeologist. This poster describes two particular methods of geophysical surveys that were employed at the Skare site (namely Electrical Conductivity and Magnetic Susceptibility), along with an interpretation of those results. The poster also includes a discussion of the usefulness and limitations of geophysical surveys as applied to the archaeological record.

SMALL CHANGES....BIG DIFFERENCES?

Laura Kopplin and Paul Bertics (Mentor), Biomolecular Chemistry

Septic shock is a disease resulting from overwhelming infection followed by organ failure and, in over half of all cases, death. Due to the severity of this disease and a lack of reliable means to prevent septic shock, we are investigating the mechanisms underlying the disorder. Current research identified several common polymorphisms in a macrophage receptor, P2X7, which is activated by bacterial infection and contributes to the immune system's inflammatory response. These polymorphisms may result in a more moderate response by the macrophage and a less severe prognosis with respect to septic shock. I am creating cellular models of the polymorphic receptors and examining the effect the polymorphisms may have on P2X7 pore formation. Further research will also be conducted examining the effect of the polymorphisms on macrophage cytokine secretion.

VIDEO-CASE ANALYSIS OF FREE PLAY IN CHILDREN WITH AUTISM

Julia Kragness and Elizabeth Larson (Mentor), Kinesiology, Occupational Therapy Program

This senior honors thesis examines children with autism's play, specifically studying how different play partners alter the social and physical environment to support the participation of children with autism in free play. Play is an arena for children to develop social skills which are limited in children with autism. Children with autism are often impaired in their social interaction and play skills (Restall and Magill-Evans, 1994) especially in symbolic and functional play (Leslie, 1987). In addition to limits in their limited ability to participate in symbolic play, the environmental supports and the intervention of caregivers may additionally restrict the play in children with autism (Missiuna & Pollock, 1991). A child's performance may be facilitated by a more competent play partner who structures the play environment and provides cuing that facilitates play.

FRANCIS BACON'S UTOPIA OF TECHNOLOGY AND ITS ROOTS IN MODERN SCIENTIFIC VISIONS

Travis Kriplean and Klaus Berghahn (Mentor), German

Technology fuels our modern cultural notion of progress and civilization. While science facilitates the development of advancing technology and potential technology fuels the pursuit of knowledge, the marriage of the two is a relatively recent cultural phenomenon whose seed was planted during the 17th century. Francis Bacon's technocratic utopian vision laid the groundwork for society's relationship with science, where knowledge serves humanity through the manipulation of nature. The emergence of scientific visions provides an opportunity to follow the evolution of society's relationship with science. None of these visions challenges Bacon's fundamental views, yet they substantially revise and elaborate his vision. These scientific visions erupt from the ever-widening gap between knowledge and wisdom, where increasing knowledge doesn't entail greater wisdom in technological applications.

INTERLEUKIN-8 RIBOPROBES FOR IN SITU HYBRIDIZATION OF MASTITIS INFECTED BOVINE MAMMARY TISSUE

Rebecca Krueger and Charles Czuprynski, Dave McClenahan (Mentors),
Pathobiological Sciences

Endothelial cells play a pivotal role in initiating and controlling the movement of cells into tissues during inflammation. One example of endothelial involvement in inflammation is neutrophil movement in response to cytokines, such as interleukin-8 (IL-8) into bovine mammary tissue during the initial stages of *Escherichia coli* (*E. coli*) mastitis. The central hypothesis was that activated endothelial cells produce IL-8 during tissue inflammation. The specific objective of this study is to use in situ hybridization with an IL-8 riboprobe to determine IL-8 expression by mammary gland endothelial cells in response to experimental infection with *E. coli*. The results to date have shown that IL-8 is an early contributor in the inflammation process.

ASSESSMENT OF TASKS GIVEN TO PRETERM INFANTS AT 9 MONTHS OF AGE

Amber Lahti and Julie Poehlmann (Mentor), HDFFS

Jennifer L. Mohr, Teresa M. Caine, Amber M. Lahti We are involved in a longitudinal study focusing on parent-infant interaction, temperament, attachment, and cognitive development in preterm infants under the supervision of Dr. Julie Poehlmann. The study follows preterm infants from their hospital discharge until 2 years of age. As part of the 9 month home visit, a series of novel tasks are presented to infants to assess aspects of their temperament. For this project, we will observe infants' reactions to 4 tasks: (a) colored block, (b) plastic barrier, (c) mechanical dog, and (d) parasol opening. We will record our observations focusing on how different preterm infants react to the tasks. We will present the results and video examples to illustrate our findings.

MAPPING OF ECONOMICALLY IMPORTANT TRAITS IN CUCUMBER AND MELON

Jacob Langness and Jack Staub (Mentor), Horticulture

For the research project, "Mapping of Economically Important Traits in Cucumber and Melon," headed by Sang-Min Chung and Dr. Jack Staub, we are working to sequence the DNA of melons and cucumbers to find morphological markersócommon genesóbetween the two species. Once found, these markers will help us to create a linkage map. From there we can modify the genes to create more favorable crop yields and higher quality cucumbers and melons. I am working with DNA that has been cut by restriction enzymes, adding different primers and amplifying the DNA. Finally, the DNA is separated through gel electrophoresis and the lab works to sequence it. By summer, the lab hopes to find at least ten molecular markers.

NATAL AND PRE-NATAL HEALTH SERVICES IN NYC; BY BOROUGH, EDUCATION, FAMILY CIRCUMSTANCE

Molly Larrison and CHARLES FRANKLIN (Mentor), POLI SCI

The New York City web site offers access to data among different boroughs and neighborhoods of New York City. After scanning the data, I found neighborhoods with lower median income had higher single mothers and higher rates of Medicaid coverage. The insurance aspect could be presumed with the understanding that women on federal and state aid generally fall within poverty standard. Was the health care provided to these women adequate? I scanned the numbers and found an intriguing premise for my oral presentation. During my presentation I explored data amongst and between single mothers living in poverty with or without insurance, levels of education, and income posed to support her child. I also compared levels of late prenatal care for mothers among different level of insurance, and found women with Medicaid more susceptible to prolong their first visit to the obstetrician than those without insurance or with private insurance.

LEAF LITTER AND SOIL RESPIRATION

Katherine Lawson and Rick Lindroth (Mentor), Entomology

Soil respiration and nitrogen cycling is an important aspect of forest ecosystems. Condensed tannins influence microbial growth by binding to nitrogen in the soil and releasing large amounts of carbon into the soil. They are found in leaves and vary chemically in different species of trees. The purpose of this project is to investigate the effects of condensed tannins from various species on soil processes. This study will 1) test how tannins from different species of trees affect respiration and nitrogen cycling and 2) the effects of the amount of condensed tannins on respiration and nitrogen cycling. Condensed tannins are extracted from three species of tree leaves: aspen, white oak, and sugar maple. Microcosms, containing the tannins, will be measured for carbon dioxide and nitrogen cycling. The data collected from the project will give us a better understanding of how secondary chemicals, like tannins, affect ecosystems and could lead to new conservation methods of forests.

TOTAL SYNTHESIS OF INGENOL

Eric Lee and Reagan Miller (Mentor), Chemistry

The highly oxygenated tetracyclic (four rings) natural product ingenol, isolated from *Euphorbia ingens* (plant), is a potent tumor promoter. By mimicking certain chemicals within the body, ingenol activates the enzyme responsible for signaling the brain for cell growth when it is not necessary. The main goal of my research project is to synthesize the natural product ingenol within the chemistry laboratory. Through a series of chemical reactions, such as acid-base, aldol, alkylation, we are able to construct the C-ring of ingenol and install synthetic handles onto it. Model studies are currently underway to test the key bond forming steps before moving on to the actual substrate. I will be available for questions and models will be on display April 12, 2004, from 12:00pm to 3:00pm.

FINDING THE DIFFERENCES IN THE MEASUREMENT OF GDP BETWEEN COUNTRIES

Adedayo Lesi and Ananth Seshadri (Mentor), Economics

On average, the ratio of the Gross Domestic Product (GDP) between the United States and third world countries is about forty. GDP is measured by multiplying productivity by the combination of capital and labor. However, productivity only accounts for a fourth of the difference between the United States and these third world countries. Thus, there is a missing measure. This project seeks to analyze differences in the measurement of GDP between countries, such as in how labor is used. I am currently looking for information on household sizes, family patterns, appliance prices, etc. world-wide. This information would provide the differences between countries, and it can show what GDP cannot measure. Hopefully, this will allow a way to accurately measure differences between countries.

DETERMINING THE EFFECTS OF DEXAMETHASONE ON LEAFY: GLUCOCORTICOID TRANSGENIC PLANTS

Adebanke Lesi and Chris Day (Mentor), Botany

In Arabidopsis, the LEAFY regulatory gene stimulates the plants' switch from the vegetative phase to the reproductive phase of flowering. The artificial 35S::LFY: GR gene is produced all the time but will only become active when it is induced by a steroid, such as Dexamethasone, a strong synthetic glucocorticoid. If a plant with a normal LFY gene and the 35S::LFY:GR gene is treated with DEX an intermediate between a flower and an inflorescence is formed: the stem stops growing, flowers at the center are composed of carpels, fruits at the side of the structure are expanded, and petal-like white material fills the fruit of the plants. In order to further study LFY's roles in these phenotypes, we are studying the effects of varying the concentration of DEX used. To test this hypothesis, we are cultivating 35S::LFY: GR Arabidopsis and non-transgenic controls, and applying various concentrations of DEX. We will observe the plants' stem length, floral arrangement, and internode length.

AN INVESTIGATION OF PLANT BASED MEDICINE FOR WOUND HEALING IN THE VOCAL FOLD

Xinhong Lim and Bernard Rousseau (Mentor), Department of Communicative Disorders

Scarless fetal wound healing has been linked with high levels of hyaluronan (HA), an important glycosaminoglycan found in tissues. Pharmacological manipulation of HA levels in vocal folds using phytochemicals with wound healing properties from medicinal plants may be a novel treatment for benign vocal fold pathologies such as scarring, post surgery. This project utilized in vitro cell cultures to investigate the effects of phytochemical extracts such as Echinacea, Bilberry, Luteolin and Oleanolic Acid on the deposition of HA from vocal fold fibroblasts. After application and incubation, extent of HA production was examined using enzyme-linked immunoabsorbent assay. Results have revealed that medium concentrations of Echinacea stimulated HA production from vocal fold fibroblasts after 24 and 72 hrs of incubation.

COWS AND THEIR IMPACT ON OUR ENVIRONMENT

Lim Lionel and Michel Wattiaux (Mentor), Dairy Science

The agricultural community is seeking to reduce avoidable losses of nitrogen (N) in feed to cows. Limiting excess N will reduce both nitrate leaching in public water supplies and ammonia emissions transformed to greenhouse gases. I have chosen this project because of strong personal environmental concerns and the fact that the dairy industry in Wisconsin has a huge impact on the environment in which I live. Using relatively new methods, the plan is to determine the N content firstly in cow feed, then subsequently urine, manure and milk. Following which, we can then determine how much N exactly is lost to the environment before proceeding on to trying to recover those losses.

IDENTIFICATION OF GENES CORRELATING TO 2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN TOXICITY

Adam Liss and Chris Bradfield (Mentor), Oncology

The environmental pollutant, 2,3,7,8-tetra-chlorodibenzo-p-dioxin, or TCDD, has been shown to lead to many different toxic effects in animals. In particular, TCDD has been shown to be a teratogen in the developing murine kidney. Previous experiments have identified various genes that change expression in response to TCDD in the murine kidney. However, it is shown that the known genes do not correlate to toxicity. The focus of this research was to identify those genes that do correspond to toxicity. In order obtain such unique cDNA clones, a murine kidney library was used to construct kidney-specific microarray chips. Using these microarray chips, changes in murine kidney gene expression were observed, including the gene for solute carrier protein family 12, which correspond to varying doses of TCDD over six different time points. This data was correlated with histological and physiological data to create a comprehensive picture of the role specific genes have on toxicity.

DISTRIBUTION OF ANGIOTENSIN RECEPTOR SUBTYPES IN RAT BRAIN AS REVEALED BY IMMUNOHISTOCHEMISTRY

Yang Liu and Mark Brownfield (Mentor), Department of Comparative
Biosciences

Injection of angiotensin into the brain causes cardiovascular and neuroendocrine responses. Immunocytochemical studies have shown that there are angiotensin containing neurons that project to important cardiovascular and endocrine control sites. Recently, specific antisera against three angiotensin receptor subtypes, AT1a, AT1b, and AT2, have been developed, partly in our laboratory. The purpose of this study is to use immunocytochemistry to determine the distribution of these receptor subtypes in different brain regions to better understand the control mechanisms exerted by the brain angiotensinergic system. Results show differential widespread distribution of these receptors. AT1a receptors are most associated with neuroendocrine sites. Both AT1b and AT2 rich areas were mostly in sites with known fluid and cardiovascular regulatory actions. These results show physiologically selective associations of these receptors.

FUNCTION OF RECEPTOR-LIKE KINASE GENES IN PLANT ARABIDOPSIS

Jenny Liu and Carl-Erik Tornqvist (Mentor), Botany

Proteins of the Receptor-Like Kinase (RLK) Gene Family are crucial in plant growth and development, disease resistance, and hormonal signaling in plants. Therefore, characterizing the RLK family may provide insight to how cells perceive outside stimuli. T-DNA insertion mutagenesis Arabidopsis lines are used to isolate plants with defects in RLK genes. Polymerase Chain Reaction (PCR) helps us isolate TDNA-specific and none gene-specific products. By producing, growing, and analyzing multiple homozygous crosses, we can make multiple gene knockouts. Analyzing and comparing the mutants with wildtype Arabidopsis helps to determine the functions of the RLKs. Currently, one developmental phenotype has been observed in a homozygous mutant for a T-DNA insertion in a single gene, furthering the characterization of this RLK subfamily. By continuing to isolate homozygous mutants and make crosses among mutant plants, we hope to identify the functions of all 600 RLK genes.

CHRONIC INTERMITTENT HYPOXIA IN RATS

Edward Lo and Mark S. Brownfield (Mentor), Comparative Biosciences

Obstructive sleep apnea causes chronic intermittent hypoxia (CIH), which can lead to hypertension. We explored CIH-sensitive brain activity at cardiovascular and respiratory control sites in rats. Expression of cfos protein was employed as an indicator of neuron activation. Rats breathed alternating 5 minutes of hypoxia and normoxia for 0, 30, 60, 90, 120 minutes or overnight in a respiratory chamber. Following anesthesia, brains were fixed, sectioned, and immunocytochemically stained for cfos. Results show widespread nuclear cfos expression in sites indicative of an environmental novelty stress experience in the chamber. Superimposed on this was CIH-induced cfos expression in hippocampus at 30–90 minutes, suggesting that other brain sites may also be sensitive to hypoxia. Cell counts of other brain sites showing cfos expression are currently being analyzed.

SEEING STRAIGHT THROUGH DEPRESSION: THE HMONG VIDEO PROJECT

Ge Lo, Amanda Moua, Youa Xiong and Diane Gooding, Jeanine Mount (Mentors), Psychology

This project is designed to produce an educational video in both Hmong and English to inform the Hmong population about the issue of depression. The video will address the signs and symptoms of depression, how it presents itself in the Hmong culture, the importance of receiving help and/or treatment, and the wide variety of interventions and treatments available. In addition to this information, the video will feature community members and mental health providers who will help serve as a familiar face to their community, building on to the available network of assistance.

MOOD CORRELATIONS OF BRAIN REGIONS ACTIVATED BY AVERSION

Mai Youa Lor and Jack Nitschke (Mentor), Psychiatry

An important human skill is our ability to anticipate a negative event and prepare psychologically for it. This study uses functional magnetic resonance imaging (fMRI) to examine brain substrates. Healthy human subjects viewed warning symbols followed by aversive and neutral pictures. An “x” predicted an aversive picture, a circle predicted a neutral picture, and a question mark predicted either an aversive or neutral picture. Subjects’ mood ratings were correlated with areas of the brain activated in anticipation of and reactivity to the pictures.

“CHANGING ATTITUDES: RURAL EDUCATION ABOUT HIV/AIDS” (CARE ABOUT HIV/AIDS)

Amy Luther and Raymond Kessel (Mentor), Genetics

I am a senior in Genetics and a Wisconsin Idea Undergraduate Fellowship Recipient. I am working with Professor Raymond Kessel—UW–Madison Medical Genetics, Marge Sutinen—director of Midwest AIDS Training and Education Center of Wisconsin (MATEC-WI), and James Wilson—Research specialist at the AIDS Network. Our project will focus on research and education of rural communities on the importance of HIV antibody testing. Written surveys with community members will constitute the research aspect of this project and will determine barriers to being HIV antibody tested in rural communities. Based on the results of this research, I will work to develop strategies to address the issues identified to communities with the help of MATEC-WI. The goal of this educational effort is to help change attitudes towards being tested, refer people to be tested, and raise awareness of the benefits of early intervention for HIV treatment, thus normalizing attitudes towards the treatment of HIV/AIDS.

ANTIGEN IDENTIFICATION IN PATIENTS UNDERGOING HORMONAL THERAPY USING SEREX

David Mai and Douglas McNeel (Mentor), Medicine / Medical Oncology

Vaccines are one treatment strategy being developed for prostate cancer . Androgen deprivation therapy (ADT), a common treatment for prostate cancer, can elicit prostate inflammation. To identify proteins immunologically recognized post ADT for possible future candidates for vaccines, the SEREX (serological identification of antigens by recombinant cDNA expression libraries) methodology was utilized. A prostate cDNA phage expression library was interrogated with serum from a patient undergoing androgen deprivation therapy to identify antibody responses occurring post-treatment versus pre-treatment. 500,000 phage were examined with sera one month following ADT. 37 immunoreactive plaques were identified and 11 were prioritized as not being recognized pre-treatment. Ongoing work will validate these results, and the identity of these recognized proteins will be determined by phage DNA sequencing.

PARKINSONIAN MONKEYS

Amanda Marsh and Ei Terasawa (Mentor), Pediatrics

Parkinson's disease is caused by the death of dopamine neurons in the brain resulting in the degeneration of the motor control system. There is no cure for the disease, only methods of easing the symptoms. We hypothesize that embryonic stem cells may be useful for treatment. Parkinsonian symptoms were induced in monkeys using a neurotoxin. ES cells transformed into neuroprecursor cells and dopamine neurons were transplanted in the brain of Parkinsonian monkeys. I am examining changes in motor skills and clinical rating based on various Parkinsonian symptoms before and after MPTP and ES cell transplantation. I am also analyzing the number of dopamine neurons in the brain tissue of three monkeys that have been through the experiment and sacrificed.

FOLLOW-UP STUDY OF THE DRINKING AND DRIVING PROBLEM IN DANE COUNTY

Michael Mason and Nina Emerson (Mentor), Resource Center on Impaired Driving

The purpose of this research was to evaluate what, if any, changes have occurred in the behavioral patterns and attitudes of those who have been convicted of drinking and driving. Specifically, the resource center surveyed 173 convicted operating while intoxicated (OWI) offenders in the Dane County area, primarily Madison. The Resource Center on Impaired Driving has conducted two previous studies in the same manner in 1981 and 1994. The offenders were given a survey that asked them to reflect on the choices they made the night they were arrested for OWI. The answers were then tallied and put in statistical form, and finally compared with the previous studies. With this firsthand information, the center hopes to recommend public policy countermeasures to combat the ongoing occurrences of drinking and driving behavior.

RUSTY CRAYFISH INVASION OF A NORTHERN TEMPERATE LAKE: LONG-TERM EFFECTS ON BENTHIC COMMUNITIES

Julia McCarthy and Jake Vander Zanden (Mentor), Zoology

Non-indigenous species may alter new ecosystems by displacing native species, changing food web dynamics and modifying physical habitats. Invasive rusty crayfish (*Orconectes rusticus*) have a negative impact on the abundance of macrophytes, benthic invertebrates and fishes in lakes. This omnivorous crayfish has direct and indirect impacts on the benthic community by both feeding on invertebrates and destroying their habitat. The aim of this study is to track the correlation between abundance of *O. rusticus* and invertebrates over two decades. Invertebrate samples were obtained from Sparkling Lake, Vilas Co., WI through Long Term Ecological Research (NTL-LTER) studies and classified to family and genus. Analysis will include calculations of invertebrate species richness and evenness in comparison to crayfish catch rates. *Orconectes rusticus* abundance will likely be negatively correlated with both benthic invertebrate species diversity and the abundance of highly vulnerable species.

CONGRESS, THE NEWS AND THE MEDIA

Garnet McLeod and Paul Schlomer (Mentor), LAFOLLETTE SCHOOL OF PUBLIC AFFAIRS

The purpose of this project is to find out how government decisions are reflected by what the news or media wants them to portray. We will look at newspapers and look back about 3 or 4 months and then see if congress then says something about the issue after it has been in the newspaper.

EMBODIED COGNITION

Sarita Mehta and Arthur Glenberg (Mentor), Psychology

One question investigated by the lab is why some young children have difficulty learning to read. The hypothesis tested is that some children fail to think about the objects the written words refer to. In previous research, comprehension improved by having children manipulate toys corresponding to the sentences they were reading, thereby forcing them to think about the meaning of the words. Current research is being done by Beth Jaworski. She hypothesizes that an underlying reason for poor mathematical problem solving is poor reading comprehension. We will attempt to improve comprehension (and thereby mathematical problem solving) using manipulation. My participation in this experiment has involved creating math story problems, helping to score the results of the math problems completed, and analyzing the results. If the research is successful, it will suggest an effective remediation for math difficulties in children.

DETERMINING THE EFFECTS OF DEXAMETHASONE ON LEAFY: GLUCOCORTICOID TRANSGENIC PLANTS.

Tara Mehta and David A. Baum (Mentor), Botany

In plants, such as *Arabidopsis*, the LEAFY regulatory gene stimulates the plants' switch from the vegetative phase to the reproductive phase, which is characterized by the production of flowers. The artificial 35S::LFY:GR gene is produced all the time but will only become active when it is induced by a steroid, such as Dexamethasone (DEX), a strong synthetic glucocorticoid. If a plant with a normal LFY gene and the 35S::LFY:GR gene is treated with DEX an unusual structure intermediate between a flower and an inflorescence is formed: the stem stops growing, flowers at the center are composed of carpels, fruits at the side of the structure are expanded, and petal-like white material fills the fruit of the plants. In order to further study LFY's roles in these phenotypes, we are studying the effects of varying the concentration of DEX used. In order to further study LFY's roles in these phenotypes, we are studying the effects of varying the concentration of DEX used.

ANALYSIS OF SEMANTIC CHANGE IN THE SPANISH LANGUAGE

Maria Melgoza and Ivy Corfis (Mentor), Spanish and Portuguese

Through the transcription of Old Spanish texts, in particular the Hispanic chivalric romances from 1400–1685, I am finding lexical data that shows the evolution of semantic change in the early Spanish language. For additional data of semantic change, I am also studying a larger corpus of texts, already transcribed in electronic form, using computerized searches and concordances, to identify words that have changed meaning since the sixteenth century. Many historical reasons explain semantic change (e.g., lexical diffusion, social contact, and slang adaptation), and all possible influences will be examined in this research, since all are important when analyzing how particular words change meaning. Through investigation, I have found that although Spanish is derived from Latin, and is, thus a Romance language, other languages spoken in the Iberian Peninsula affected the lexicon through foreign borrowings and new meanings. I will show that language keeps changing through time.

COHESION AND COHERENCE IN THE NARRATIVE DISCOURSE OF TEMPORAL LOBE EPILEPSY PATIENTS

Ayswarya Menon and Brian Bell (Mentor), Neurology

It is well established that some individuals with temporal lobe epilepsy (TLE) demonstrate language deficits at the single word level. However, discourse production rarely has been examined quantitatively within this group. In a previous study, we examined performance on structured tasks of narrative (describing a six-panel cartoon) and procedural (describing grocery shopping procedures) discourse. Mild discourse dysfunction was present in a significant minority of TLE patients, but this deficit was not closely associated with other language measures. The goal of the present study is to further study discourse ability and its neuropsychological and neuroanatomical correlates in TLE patients. This study compares adult TLE patients and controls on two unstructured narrative discourse tasks (descriptions of family and work) and examines two aspects of language, cohesion and coherence, not previously studied in TLE patients.

GENERATION OF ADENOVIRUS THROUGH CRE-LOX RECOMBINATION

Dejan Micic and Eugene Kaji (Mentor), Medicine

Cardiac hypertrophy is a major cardiac risk factor that results from stimuli like hypertension, myocardial infarctions, and valve disease. The objective of my research is to generate adenoviruses that will be used in analyzing specific genes related to calcineurin-mediated cardiac hypertrophy. One of the needs for adenoviruses in cardiovascular research stems from the difficulty of introducing exogenous DNA into cardiac cells. We will generate genetically altered adenoviruses by combining a shuttle plasmid containing a gene of interest and a viral DNA backbone using the Cre-lox recombination technique. The altered adenovirus is used to infect primary neonatal myocardial cells and will over express the genes of interest. We can then assess the particular gene's role in cardiac hypertrophy without having to generate transgenic mice.

DETERMINATION OF EXTRA-HEPATIC TISSUE VITAMIN A CONCENTRATIONS IN CAPTIVE RHESUS & MARMOSET MONKEYS

Jordan Mills and Sherry Tanumihardjo (Mentor), Nutritional Science

Recent work in the determination of vitamin A requirements of rhesus monkeys used for biomedical research has revealed subtoxic to toxic hepatic vitamin A concentrations. Histological examination of liver showed hepatic stellate cell hypertrophy and hyperplasia, which in conjunction with findings of high serum retinyl esters in both the liver tissue and serum, provide sufficient justification for further study in this area. Meanwhile, the livers of marmoset monkeys, another common experimental animal, were also high in vitamin A, as was serum retinyl ester concentrations, although no evidence of stellate cell irregularities was apparent. Both species had consumed commonly used research diets containing excess preformed vitamin A. In an effort to further define the effects of chronically high dietary vitamin A, we analyzed lung and kidney tissues and found elevated concentrations of retinol and several retinyl esters, further demonstrating the consequences of excess vitamin A intake.

AMERICAN INDIANS AND CRIME

Faun Moses and Gary Sandefur (Mentor), Sociology

This project takes a further look at American Indians and crime, specifically looking at their involvement in the United States Criminal Justice System both as offenders and victims. By analyzing and comparing Census data from 1990 and 2000, I will observe how American Indian families have changed over this time period, specifically single female headed households, poverty rates and educational attainment. I will also be evaluating the Department of Justice's National Crime Victimization Surveys, hoping to make a correlation between increased American Indian involvement in crime and the above changing family structures.

PCR FOR CSP1KO MICE

Beau Nguyen and Eugene Kaji (Mentor), Medicine

Calcipressin-1 (CSP1) is an endogenous inhibitor of calcineurin, a signaling molecule involved in cardiac hypertrophy. The CSP1KO mouse has had its CSP1 gene deleted through transgenic means. Our laboratory uses this model to test for cardiac hypertrophy involving calcineurin. As of present, genotyping these CSP1KO mice requires Southern analysis that takes 4 days. As an alternative, I am developing a PCR based genotyping assay which will require only one day. The objective of my research is to find primers and develop a protocol for this PCR based genotyping of CSP1KO mice. This will save substantial time and effort for our laboratory.

THE EFFECTS OF GROWTH FACTORS ON THE CELL FATE OF E15 RAT NEURAL STEM CELLS

Wendy Nguyen and Ronald Kalil (Mentor), Ophthalmology and Visual Sciences

Fibroblast factor-2 (FGF-2) and epidermal growth factor (EGF) are types of mitogens that are effective in promoting neural stem cell (NSC) proliferation. However, these growth factors may affect cell fate. To investigate this, we cultured NSC from the subventricular zone of the E15 embryonic rat in media that contained either FGF-2, EGF, or both. Then we characterized the cells by staining for cell-specific markers. To do this, we used antibodies for specific proteins that are associated with undifferentiated cells, neurons, or glial cells. Then we determined if there were significant differences among the types of cells present after exposure to FGF-2, EGF, or both. By doing this, we have been able to determine how FGF-2 and EGF influence the lineage of rat NSC in vitro.

HIGH RESOLUTION NUMERICAL SIMULATIONS OF HIGH WIND EVENTS DURING THE SUMMERTIME AT PUGET SOUND

Emily Niebuhr and Matthew Hitchman (Mentor), Atmospheric and Oceanic Sciences

The goal of this experiment is to figure out why there were two very intense wind events within the three day period of August 13th, 14th and 15th of 2002. We studied this event through the UWNMS on a computer and used Vis5d to look at the data for the dates of Tuesday, August 13th — Friday 16th. Through this program we hope to better understand the impact of a high pressure system on local winds and therefore be able to more accurately predict the behavior of local winds in the future.

EFFECT OF PH ON THE DISSOLUTION RATE OF ARSENOPYRITE AND CONCENTRATION OF SPECIES

Kira Novakofski and Pamela Doolittle (Mentor), Chemistry

The oxidation of naturally occurring sulfide minerals, such as arsenopyrite (FeAsS), leads to the production of sulfuric acid, which has a significant negative impact on the environment and humans and animals. The exact mechanism by which arsenopyrite is oxidized is still not completely understood. By observing the quantities of species released during a nine day oxidation of arsenopyrite in perchloric acid (HClO₄) at various acidic pH values, the experimentally derived mole ratio was compared with the mole ratio found in the currently accepted reaction mechanism. Preliminary results demonstrate the theoretical 1:1:1 Fe:As:S stoichiometry.

AUDITORY FUNCION IN ADULTS AND CHILDREN

Megan O'Brien and Gary Jones (Mentor), Communicative Disorders

The scene is a loud, crowded restaurant, and you are trying to concentrate on your friend's voice. The accessory noises present are pulling your concentration from his/her words, but you are still able to extract his/her message through the noises. This type of setting is very common, and this research of auditory functions looks at how our brains segregate these noises. In testing of subjects, this acoustically complex environment is simulated. Subjects concentrate on one voice while accessory noises compete with it. These competitors vary in number and in position relative to the target speech source. Previous testing showed this ability to ignore irrelevant information improves with age, so current testing is exploring what variations create a more difficult listening environment. The end goal of this project is to have a greater understanding of the ideal listening environment, which will help with the production of more effective hearing aids and cochlear implants in the future.

IS PHARMACY THE ANSWER TO THE IMMUNIZATION DELIVERY AND EMERGENCY PREPAREDNESS AND RESPONSE DILEMA?

Chiemeka Offor and Jeanine Mount (Mentor), Social & Administrative Sciences

This study seeks to determine what factors, such as state laws, influence the extent at which pharmacists are involved in immunization and emergency-response activities. We began the first stage reviewing state laws and pharmacy board regulations in relation to immunization delivery to begin categorizing states. I am currently searching state association websites to determine whether or not immunizations or emergency-preparedness is a topic they have deemed worthy of being mentioned. Next, key state contacts will be contacted to verify our findings and validate our results. The next step takes a sample of 15 states where pharmacy managers will be interviewed, to determine individual attitudes regarding immunization-emergency activities. The final stage will consist of conferences of key stakeholders to discuss the findings and of this study, hopefully to promote higher future pharmacy involvement.

ACCURACY AND PRECISION OF PIXIMUS DENSITOMETRY FOR EX VIVO MOUSE LONG BONES

Tyriina O'Neil and Robert Blank (Mentor), Medicine

Many densitometric studies in mice assess bone mineral density at specified regions of interest, often using ex vivo specimens. Presently, we sought to determine the precision and accuracy of ex vivo densitometry of mouse bones, comparing 2 software versions and 2 data acquisition techniques. The newer software allows adjustment of the threshold value for bone, improving the ability to analyze bone edges correctly. We found that our instrument has a position artifact, dependent on the specimen's coordinates in the scanned field. Our findings establish the limitations of ex vivo densitometry with the PIXImus and support recommendation that investigators seek position artifacts in their instruments.

DAY TREATMENT, RESIDENTIAL AND JUVENILE CORRECTIONAL SCHOOLS PROJECT.

Natalie Orosco and Kimber Malmgren (Mentor), Rehab Psych & Special Education

More than 147, 00 students with emotional and behavioral disorders and learning disabilities are educated in day treatments and residential schools for youth with EBD and committed to juvenile corrections. Serious concerns exist that these students are not benefiting from current educational reform efforts. As a result, my research mentor, and two other professors, is assessing the curriculum, students learning instruction and accountability. The assessment process is done by way of a survey that can be filled out on line or though the mail. The assessment is a three-year long period. The first year principals, math teachers, and reading teachers are surveyed. The second year we will be surveying school district level and state-level Directors of Special Education about the issues they see affecting the alignment of instructional practices in those alternative settings with state and federal policies. Also case studies begin and the third year will continue with case stud

EVALUATING CELL TRAFFICKING CHARACTERISTIC OF CT-26 CELL WITH LABELED NM404

Angelina Orozco and Jamey Weichert (Mentor), Radiology

The primary objective of this project is to demonstrate whether it is possible to use I125 —labeled NM404 CT-26 cells to monitor tumor cell trafficking in mice using gamma camera imaging. Following intravenous (tail vein) or subcutaneous injection of NM404 labeled CT-26 cells, the mouse will be scanned for radioactivity with a Bioscan AR2000 scanner and by micro CT to confirm tumor location, size, and radioactivity. After 7–14 days, various tissues will be dissected, scanned ex vivo and counted for biodistribution. Preliminary results indicate that it is possible to radiolabel CT-26 cells with NM404 in culture, however external visualization has been difficult due to low sequestration of NM404 by tumor the cells. This research can further our understanding of how tumor cells migrate in a living host.

THE HEALING PROCESS OF DAMAGED VOCAL FOLDS AND THE EFFECTS OF HYALURONIC ACID ON THE SCARRED AREA

Rujuta Parikh and Bernard Rousseau (Mentor), Communicative Disorders

Our laboratory has been researching the effects of hyaluronic acid (HA) on damaged vocal folds to determine if it improves the rate of healing. Functional vocal folds are crucial in many professions, and we want to provide the most effective therapy to those people. The lab uses research animals to look at how HA affects the vocal folds by scarring one side of the vocal fold. Then, after harvesting the larynx the vocal folds are examined on a cellular level. We hope to introduce a treatment that will greatly improve the recovery of scarred vocal folds.

GUIDE COMPARISON PROJECT

Chen Paul and Wei-Yin Loh (Mentor), Statistics

The purpose of the GUIDE comparison project is to assess the accuracy of GUIDE — a comprehensive regression tree algorithm developed by Wei-Yin Loh at the University of Wisconsin–Madison. The purpose of GUIDE is to determine the factors that affect the dependent Y variable. For example, we can determine to what extent a baseball player's statistics (homeruns, batting average, runs batted in, etc) contribute to this player's salary. For this research, we will use data from previous STAT 421 class projects and use GUIDE to get results from these data. The accuracy of these results will then be compared to the accuracy that the students got from their projects using XLISPSTAT, another statistical program. Later this semester, Professor Loh is planning on having his students run both XLISPSTAT and GUIDE. Based on their experience, and my URS research results, Professor Loh may decide that he will teach the GUIDE method instead.

EFFECTIVENESS OF EMBRYONIC STEM CELL TRANSPLANTATION AS A TREATMENT FOR PARKINSON'S DISEASE

Ben Paulson and Ei Terasawa (Mentor), Primate Center

Parkinson's disease affects as many as one million Americans, or 1 in every 5,000 people. One future treatment may be transplanting embryonic stem cells differentiated into dopamine neurons or neuronal precursor cells into a patient with Parkinson's disease. We are investigating the effectiveness of embryonic stem cell transplantation in a Parkinsonian monkey model. The effectiveness of this treatment will be quantified through a variety of methods, including weekly motor skill tests and behavioral observations rated according to an established scale of symptoms. Also, microPET imaging scans taken before and after are analyzed using imaging software to determine dopamine levels in the monkeys. This research may lead to more effective treatment of Parkinson's disease, or other neurodegenerative disorders like Alzheimer's or Huntington's.

IMPACT OF LOW-DOSE METHYL PHENIDATE ON DOPAMINE EFFLUX IN NUCLEUS ACCUMBENS AND PREFRONTAL CORTEX

Kyle Pfister and Craig Berridge (Mentor), Psychology

This project examines the impact of low-dose methylphenidate (Ritalin) on dopamine (DA) efflux in the nucleus accumbens (Acc) and prefrontal cortex (PFC), two brain regions critical for higher cognitive function and implicated in Attention Deficit and Hyperactivity Disorder (ADHD). It is hypothesized that low, clinically-relevant doses of methylphenidate preferentially increase dopamine release within the PFC. To test the hypothesis, rats were given methylphenidate via intraperitoneal injection or oral gavage and extracellular dopamine release was assessed by in vivo microdialysis. Current results reveal dose-dependent increases in dopamine efflux in both the nucleus accumbens and prefrontal cortex, and indicate a greater sensitivity of PFC DA than Acc DA to methylphenidate. Future data analysis will compare the effects of varying modes of methylphenidate administration (injection vs. oral gavage).

BALLERS AND SHOT CALLERS

Andrew Pineda and Carole Hsiao (Mentor), Education

“Nobody says you have to be gangsters, read more learn more change the globe, ghetto children do your thing, hold your head up lil man you’re a king.” -Rap Superstar Nas This study “Ballers and Shot Callers,” uses hip-hop culture to connect with low-income African American teenagers. Hip-hop culture has helped me see the boys’ ideas and views about society and education. Through participant observation and one-on-one interviews I have been collecting my data. This is a population that is at risk of dropping out of school, getting involved in criminal activities and landing in prison. I am working with Carole Hsiao who is using the arts and popular culture to understand what these young people know and how they don’t have the opportunity to express themselves in school.

REPRESENTATION OF MOTION AND DEPTH IN THE BRAIN

Rachael Pius and Alexander Grunewald (Mentor), Psychology and Physiology

The purpose of this experiment is to isolate the effects of binocular disparity and direction on the activity of motion sensitive neurons in the visual cortex of the Rhesus Macaque. It is known that humans use visual cues to infer 3D depth, but it is not yet clear how this perception occurs in the brain. Our preliminary findings indicate that more than half of the neurons in both the V1 and MT (portions of the brain) are activated by both directional and disparity cues. Although direction and disparity act separately of each other, if their individually produced activity is known, an accurate 3D representation of how they play off each other can be constructed (joint tuning map). Additionally, if a non-preferred disparity or direction is chosen to activate a particular cell, it will not be stimulated. In the future, this gathered data will be used to develop prosthesis for the blind to help them regain sight.

ARSENIC CONTAMINATION IN THE DRINKING WATER IN SOUTHEASTERN WISCONSIN

Jennifer Pletz and Tara Root (Mentor), Geology and Geophysics

This project focuses on arsenic contamination from natural sources in residential wells in southeastern Wisconsin. Recently, the Environmental Protection Agency lowered the maximum contaminant level for arsenic from 50 ug/L to 10 ug/L. Wells in southeastern Wisconsin commonly have higher levels than 10ug/L of arsenic. Arsenic contamination can lead to several health effects including various cancers. My research mentor collected a 300-foot core from an arsenic- impacted area in Lake Geneva, Wisconsin. We hope to identify potential minerals associated with arsenic through leaching experiments and x-ray diffractions. The goal is to discover what is causing the release of arsenic into the drinking water wells. This information will help individuals seeking to maintain safe drinking water supplies.

OVARIAN HORMONE EFFECTS ON SKELETAL MUSCLE INJURY AND RECOVERY

Fawnah Price and Barbara St. Pierre Schneider (Mentor), Nursing

Professor Barbara St. Pierre Schneider would like to determine the effects of estrogen and progesterone on eccentrically (lengthening) contracted plantarflexor (calf) muscles. The hypothesis formed by Professor Schneider is that estrogen, with or without the presence of progesterone, delays the recovery of eccentrically contracted muscles. Ovariectomized mice will be treated with estrogen and/or progesterone pellets, undergo eccentric contractions, and then allowed to recover for one to two days. Muscle fatigue will be the focus of analysis. Through this research, Professor St. Pierre Schneider hopes to determine key factors that affect recovery from eccentrically contracted muscle injuries.

GLOW RESTAURANT & THE 12-BAR LOUNGE

Keriann Prokop and Mark Nelson (Mentor), ETD

Glow Restaurant & The 12-Bar Lounge is a place where adults of all kinds come for dinner with music and end up merging with their environment. This real-life hospitality design project was to create a new environment for a vacant space at 111 W. Main St., in downtown Madison. After researching and analyzing two restaurants and a famous designer, I developed my concept. Glow was to be a place where jazz music filled the air and frosted backlit panels of glass offered a radiating light. Just like ordering a Blues-tini from the adjoining 12-Bar Lounge, you could order your favorite jazz standard to be played by live musicians. With Computer Aided Drawings enhanced with hand rendering giving you a visualization and jazz music giving you the beat, the essence of Glow comes alive right before your eyes.

IN THE MIND OF A CRAB: A LOOK AT PEPTIDE EXTRACTION METHODS

Amara Pulver and Lingjun Li (Mentor), Pharmaceutical Sciences

Understanding the neuropeptides of simple crab nervous systems will help scientists better understand cell signaling in more complicated organisms such as humans. Extracting the neuropeptides is the first step in researching the nervous system of a crab. Peptides (the transmitters that carry nerve impulses) are extracted from the crustacean organs using different solutions and a small grinder. The goal of my project is to optimize the peptide extraction method to give the best results for instrumental analysis. Mass analysis determines which peptides (which may not be known) are present in the crustacean nervous system and possibly their composition. I am testing three different extraction solutions and various post-extraction techniques, hoping to find which combination gives the best results for peptide mass analysis.

THE ROLE OF ORGANIC COMPOUNDS IN KAOLINITE PRECIPITATION RATE

Sonja Raaum and Nita Sahai (Mentor), Geology & Geophysics

In nature, aluminosilicate clay minerals such as kaolinite are the product of chemical weathering of feldspars, the most abundant minerals on earth's surface. Naturally occurring organic acids in soils affect the rate of kaolinite formation. Our focus is to determine the effect of two structurally similar but chemically distinct organic acids, containing phosphate and carboxylate functional groups. Aqueous solutions of the acids, aluminum and silicon are "aged", sampled at intervals, and filtered for precipitates. Aqueous ion concentrations are measured, and precipitates are characterized using Transmission Electron Microscopy (TEM). Precursor minerals (aluminum oxyhydroxides) are formed before kaolinite. Interconversion between precursors controls overall kaolinite formation rate. Our results help determine the sequence of precursors in the presence of each organic acid, thus, their effect on kaolinite precipitation.

BLOOD-STREAM INFECTIONS IN CHILDREN WITH CANCER

Jenelle Rademacher and Carolyn Aradine (Mentor), Nursing

Children with cancer are commonly treated using indwelling venous catheters to deliver their medications over days/weeks. Blood stream infections are a life-threatening complication of this treatment. This retrospective chart review research seeks to identify whether subgroups of these children (by type of cancer or time period in treatment) are at increased risk of developing bloodstream infections. If some groups are at higher risk, it may become possible to institute proactive treatment to improve their health outcomes. The presentation will review relevant literature and data collection methods; results are not expected to be available by mid-April.

SOURCE CONTRIBUTION TO PRESS COVERAGE OF AN ENVIRONMENTAL CONTROVERSY IN WISCONSIN

Lucy Rahn and Sharon Dunwoody (Mentor), Journalism

This project seeks to understand the influence of grassroots organizations on what becomes news in newspapers.† Several studies have investigated newsroom influences in affecting news content but far fewer have sought to understand the complex relationship between source, journalist, and what makes news. In early 2000, the Perrier Group of America proposed to move into Big Spring, Wisconsin to drill and bottle large amounts of water.† The citizens and grassroots groups succeeded in persuading Perrier to leave, largely on grounds of environmental concern expressed through resolutions, boycotts and lawsuits.† I conducted an analysis of Perrier stories in regional and local papers and interviewed people from the pivotal grassroots organizations and journalists †who covered the issue.† I found that grassroots groups were most successful at being covered when they framed their message using traditional media frames (related to government, industry or citizen concern).

THE BATTLE BETWEEN CONGRESS AND THE PRESIDENT OVER THE USE OF MILITARY FORCE.

Greg Ramaswamy and Jon Pevehouse (Mentor), Political Science

When the President of the United States intends to use military force and does so, it is widely assumed that Congress does not hinder the President's goals. It is argued that Congressional support for the use of military force is due to a belief that the President would only use force for legitimate reasons and when the troops are abroad, Congress will naturally rally behind the Commander in Chief. However, the actions of Congress since 1945 do not completely support this theory. Congress has tried to limit the President's foreign policy goals through various methods including amendments to legislation and blunt criticism on the House/Senate Floor. The hypothesis is that when the President's party does not control Congress, the President is faced with more opposition and is less likely to use military force abroad than when the President's party is in control of Congress. This research will attempt to prove that hypothesis.

COMPARISON OF PC-VIPR WITH 3D TIME OF FLIGHT ANGIOGRAPHY IN THE DETECTION OF CEREBRAL ANEURYSMS

Prakash Rao and Charles Mistretta (Mentor), Medical Physics, Radiology and Biomedical engineeri

3D Time of Flight (3D TOF) and Phase Contrast (PC) are two MRI techniques currently used for magnetic resonance angiography (MRA). However, several limitations make PC difficult to implement in clinical practice, making 3D TOF preferred for anatomical MRA. Recently developed is a PC imaging technique using VIPR (Vastly undersampled Isotropic PROjection imaging) called PC-VIPR. While PC-VIPR has achieved acquisition speeds faster than current techniques, it is hypothesized to also provide anatomical information competitive with 3D TOF. To show this, a time-resolved sequence (ECG-gated) will be used with PC-VIPR to image certain vessels in subjects with cerebral aneurysms. Optimization of parameters associated with PC-VIPR data acquisition will be done so that the anatomical information it provides can be compared to the corresponding 3D TOF examinations.

A BRIEF LOOK INTO BIOPOLYMERS

Mathew Reddick and Tim Osswald (Mentor), Mechanical Engineering

Abstract: I am researching several topics related to biopolymers. These topics include (i) general information about biopolymers such as polylactic acid and soy polymers, (ii) the molecular structure and chemical synthesis of PLA, which is a biodegradable, aliphatic polyester synthesized from corn and sugar beets, and (iv) a look into the future of processing these materials to maintain the necessary properties. The reason that I have chosen to research these materials is that in my opinion there is a need to develop renewable alternatives to the use of petroleum to preserve the quality on Earth and our future. The research being done is focused on the engineering of the materials to attain the desired properties for the proposed uses.

DOES HUMAN MILK PASTEURIZATION INACTIVATE BIOACTIVE FACTORS OF POTENTIAL BENEFIT FOR INFANT GROWTH?

Hima Reddy and Pam Kling (Mentor), Pediatrics

Human breast milk contains bioactive factors, proteins of potential importance for infant development. Concerns about infections passed to the baby are often countered by pasteurization that kills pathogens but can inactivate proteins. We set out to examine whether pasteurization decreases bioactive factor concentrations of potential benefit for gut integrity and maturation. We are testing pasteurization effects using 60 human breast milk samples. Each sample is divided to provide a control and experimental sample. Selected bioactive factor concentrations are determined by ELISA and RIA, and compared in pasteurized and non-pasteurized milk. The study is powered to find a differential of 25% or more on the $p=0.05$ level. This experiment will provide more insight into the effects and potential risks of pasteurization to infant nutrition.

TESTING RECOMBINANT BCG CONSTRUCTS FOR EXPRESSION OF T CELL EPITOPES

Sasha Rihter and Matyas Sandor, Dominic Co (Mentors), Pathology and
Laboratory Medicine

Millions of T cell specificities participate in an immune response to Mycobacterium bovis strain bacille Calmette-Guerin (BCG), a model for human tuberculosis. In previous studies, mice with only two types of T cells specific for pigeon cytochrome C (PCC) and hen egg lysozyme (HEL), respectively, were infected with PCC-expressing BCG and HEL-expressing influenza. In this context, these two T cells did not interact. We hypothesize that no interaction was observed, because PCC and HEL were expressed in different pathogens. To test this hypothesis, recombinant BCG were made that express both PCC and HEL. Extracts from this construct, GFP-PCC-HEL in BCG, were tested for their ability to activate HEL-specific and PCC-specific T cells by measuring upregulation of activation markers by flow cytometry.

THE ROLE OF TALIN IN CALPAIN MEDIATED CELL MIGRATION

Mary Rodgers and Anna Huttenlocher (Mentor), Pharmacology

It has been shown that calpain, a calcium dependent protease, mediates cell migration. The pathway by which calpain accomplishes this is unknown. Talin, a focal adhesion protein, is a calpain substrate. To determine if talin is involved in calpain mediated cell migration, a noncleavable form of GFP tagged talin was created. A point mutation was made in the cleavage site and western blot analysis confirmed that this prevented calpain mediated cleavage. Cell staining showed that the noncleavable form of talin localizes to focal adhesions like wildtype talin. Preliminary live imaging studies show altered focal adhesion disassembly rates in cells expressing noncleavable talin, supporting a role of talin cleavage during cell migration.

THE HEART MUST GO ON

Bradley Rose and Richard Moss (Mentor), Physiology

My research is a pursuit of knowledge about heart failure by regulating the contraction of striated cardiac muscle cells. Knowledge about the human heart, or more importantly why it fails, will lead to many discoveries on how to prevent such failures and keep a heart “going on”. This knowledge is obtained through enzymatic digestion of the muscle cells from the hearts of mice. Through enzymatic digestion of hearts we obtain living ventricular myocyte (single) cells. With these cells we are able to assess the functions of normal and diseased hearts; these functions being the extent of shortening (contraction) and the time course of those contractions. With this knowledge, the possibility of counteracting the deficits in function of a diseased heart will increase.

NM404 AND TUMOR RESPONSE TO RF ABLATION

Sarah Savengseuksa and Jamey Weichert (Mentor), Radiology

NM404 is a radioactive and diagnostic tumor targeting agent that is selectively retained by cancer cells. Due to the selective retention, NM404 affords potential as both a diagnostic and therapeutic agent. . The aim of my project is to evaluate its potential to monitor tumor response to RF ablation therapy. RF ablation involves placing a probe onto a tumor and heating it up to approximately fifty degrees Celsius, resulting in neighboring cell death. Following ablation, NM404 will be injected intravenously and the tumor subsequently imaged to evaluate uptake. With this experiment we intend to find how effective RF ablation is and to determine whether necrotic cancer cells are able to sequester NM404. Histology tests on the tumor will be performed in order to confirm imaging results. Results may lead to other hypotheses about treatments, cancer biology, and the mechanism which by NM404 is taken up by cancer cells.

AN AFRICAN PERSPECTIVE TO THE AIDS EPIDEMIC IN AFRICA

Kristen Scherkenbach and Akua Sarr (Mentor), African Languages and Literature

Only about 20 years ago, AIDS was unknown in Africa. Now, AIDS is the number one killer disease in Sub-Saharan Africa, surpassing malaria. In 2002, 2.4 million people died of AIDS-related illness in Africa and it is estimated that 29.4 million people are currently living with HIV/AIDS in Sub-Saharan Africa. That is two-thirds of HIV/AIDS cases reported globally. Because it kills so many adults it decimates the workforce, fractures and impoverishes families, orphans millions and shreds the fabric of communities. The research that I will present will tell the story of the impact that AIDS has on the African people and how they perceive the crisis in their own communities. This research is inspired by the short story “Effortless Tears” by Alexander Kanengoni. Themes stemming from this story will be presented as well as further research into the topic.

DISTINCTIVE FEATURES OF REACTIVE OXYGEN SPECIES SCAVENGING IN AXOTOMIZED RETINAL GANGLION CELLS

Christopher Schlieve and Leonard Levin (Mentor), Ophthalmology and Visual Science

Reactive oxygen species (ROS) are candidates for signaling molecules transducing the effects of axotomy in retinal ganglion cells (RGCs). However, only a subset of ROS scavengers can delay death in axotomized RGCs. To explore how ROS scavengers interact with specific ROS, we combined ROS generating systems and scavengers and assessed RGC survival. Postnatal 2–4 Long Evans rat RGCs were retrogradely labeled. At postnatal days 11–13, retinas were cultured in ROS-generating systems and scavengers. ROS generating systems tested were: hydroxyl radical (2 μM CuSO_4 , 2 μM phenanthroline, and 100 μM ascorbic acid; CPA), O_2^- (30 μM paraquat), nitric oxide (250 μM SNAP), and H_2O_2 (30 μM). Scavengers tested were catalase, PEG-SOD, MnTMPyP, Trolox, deferoxamine, and U-74389G. RGC viability was determined with calcein-AM 24 hours after plating. Our results concluded that the effects of ROS scavengers on axotomized RGCs are not comparable to what would be expected from their chemical properties.

KERATINOCYTE CELLS USED AS A NON-INVASIVE TISSUE SOURCE FOR ASSAYING A DRUG DETOXIFICATION PATHWAY.

Jessica Scott and Lauren Trepanier (Mentor), Medical Sciences

Sulfamethoxazole (SMX) is a clinically useful antimicrobial/antiprotozoal agent that is used to treat opportunistic infections in HIV-infected patients. However, the use of SMX is significantly limited by the development of hypersensitivity reactions, which are thought to be related to an SMX hydroxylamine metabolite. We have shown that SMX hydroxylamine is detoxified via enzymatic reduction by NADH cytochrome b5 reductase (b5R) and cytochrome b5 (cyt b5). Measuring the expression of these two proteins in individuals would allow us to determine the relationship between variability in b5R and cyt b5 and the outcome of SMX hypersensitivity. Liver and leukocytes express b5R; however, liver sampling is invasive, and leukocyte yields are sometimes low. The purpose of this project is to develop a method of culturing keratinocytes from human hair follicles, as a non-invasive tissue source for comparing individual variability in this pathway of hydroxylamine detoxification.

PURIFICATION AND CHARACTERIZATION OF CPB-1

Yiqi Seow and Marvin Wickens (Mentor), Biochemistry

Cytoplasmic Polyadenylation Element Binding (CPEB) proteins are found in higher organisms including humans. CPEBs have been shown to regulate the rate of protein synthesis in embryo development in *Caenorhabditis elegans* worms and are suspected of playing major regulatory roles within neurons. This has wide-ranging implications in the understanding of developmental biology and disease progression. They regulate mainly by binding to the mRNA, a messenger molecule that 'encrypts' the protein, and preventing it from working. This project hopes to purify and characterize a CPEB protein, CPB-1, to determine the nature of the interaction that limits protein synthesis. The protein will be artificially produced in *Escherichia coli* and purified using affinity chromatography. Methods to be used in characterization will depend largely on the properties of the purified protein.

THE NAPOLEON NEXUS: FRANCE AND HAITI IN THE POST/COLONIAL NINETEENTH CENTURY

Neha Sheth and Deborah Jenson (Mentor), French and Italian

This study seeks to determine the impact of the Haitian Revolution on the French people. The loss of the colony of Saint Domingue (now Haiti) ended France's hopes for an empire in the Western hemisphere. The Revolution also gave rise to a plethora of Francophone and Creolophone literature. This study explores that literature. The literature is examined to determine the political and societal issues of France at the time. French opinions on colonization, slavery, Napoleon, and Toussaint Louverture are particularly important. This study is finding that the Haitian Revolution had a large impact on the mentality of the French people. The Revolution turned the French against slavery, Napoleon, and his imperial designs.

TIMING OF MENARCHE AND BODY SATISFACTION AMONG COLLEGE FRESHMAN

Rebecca Schlafer and Julie Poehlmann (Mentor), HDFS

This study was conducted as part of a senior honors thesis through the School of Human Ecology. The study explores the relationship between menarche (timing of first menstrual period) and body satisfaction. Previous research has found a relationship between paternal involvement and timing of menarche; therefore, father's involvement in the subjects' lives was also measured. It was hypothesized that women who experienced menarche at a younger age will have lower body satisfaction when father involvement is controlled for. Approximately 100 women in their freshman year of college were recruited through the university housing system to participate in the study.

THE TONY HAWK LEARNING PROJECT

Lauren Silberman and Elisabeth (Betty) Hayes (Mentor), Curriculum & Instruction

The study is to show how even a “sport” video game can incorporate many types of learning, to call attention to what might be overlooked as significant forms of learning, and to understand and take advantage of the opportunities video games afford as more deliberate learning environments. The aspects explored are the skills and techniques required to be successful in the game, the semiotic domain of skateboarding (within) the game, the environment that skaters skate in, the personal vs. group identity that is shown through the general appearance of the skater, and the values and icons that the game teaches players. We are finding that sport video games support learning; we hope to find how one learns about oneself as a learner from playing.

HUMAN RIGHTS - IN SEARCH OF THE KILLING FIELD

Kannitha Sith and Macken Marlys (Mentor), Linguistics

I am working with Marlys Macken doing research on the history of the Killing Field through library work, reading and writing several reports. I am also collecting visual media and photographs as part of the documentary. My research will be linked with the history of Cambodia during the Pol Pot regime and transition in government to present day human rights in South East Asia. Through my research, I will be inviting Dith Pran who is a well renowned Cambodian hero, author, a survivor of the Killing Field and photographer for New York Times, to the University of Wisconsin, Madison. During the week of his visit, the movie The Killing Field will be showing at Union Theater the day before he arrives. The movie is the life and history of Dith Pran. I will also be doing a Bascom display of photographs and facts about the Killing Field, the impact and present day Cambodia. Through this project, I hope to educate and increase aware

ALCOHOL AND EMOTION REGULATION: EXAMINING VOLUNTARY EMOTIONAL RESPONSE

Jennifer Sloan and John Curtin (Mentor), Psychology

Previous studies have examined the relationship between alcohol intoxication and emotional response, in particular, stress response. However, this research has yielded equivocal results. One explanation for this inconsistency in findings may be the failure to distinguish between initial emotional response and subsequent voluntary regulation of this emotional response. In the current project, we examined the effects of alcohol on both initial emotional response and subsequent voluntary regulation of this emotional response. Sober and intoxicated participants viewed negatively valent and neutral images. Participants were instructed to suppress, maintain, or enhance their emotional reaction to the images; emotional reaction was measured through the fear potentiated startle (eye blink). Initial results have shown that sober participants were able to regulate their emotion better than intoxicated participants.

THE SURFACE CHEMISTRY OF SILICON LIBBY SMITH, WENSHA YANG, AND ROBERT HAMERS DEPT. OF CHEMISTRY

Elisabeth Smith and Robert Hamers (Mentor), Chemistry

Electrochemical impedance spectroscopy provides information concerning the hybridization of complementary DNA strands on a silicon surface. To make accurate measurements, I have been working on new methods for stabilizing Si surfaces in contact with aqueous fluids. t-butyloxy-carbonyl protected amines are attached first, as the alkene group on the amine reacts with the hydrogen terminated silicon surface to form a Si-C bond. However, the large size of the protecting group prevents the molecules from packing together closely, which in turn allows water down the interface and makes the layers unstable after long periods of time. My goal is to force the small iodomethane molecule down to the surface to react with any remaining Si-H bonds. This will prevent water from reacting and destabilizing the surface, allowing multiple cycles of hybridization and denaturation over time that will give stable electrochemical impedance readings.

BLACK MUSIC W/ AN EMPHASIS ON JAZZ STYLE, HISTORY, AND TECHNIQUE

Ingrid Smith and Richard Davis (Mentor), Jazz

The spectrum of Jazz Ingrid Smith My research is on Black Music with an emphasis on Jazz history, style and technique. The purpose of my research is to identify the stylistic differences between mainstream Jazz vocalists of the 20's-present. I have chosen to pursue this research because many Jazz vocalists are generically clumped together under one genre when their individual talents, contributions, and styles should be identified and appreciated. I am doing my research by reading autobiographies, biographies, and audio analysis/comparison which include listening to one song that has been recorded by several Jazz vocalists and comparing the different styles they used. I hope to be able to identify the stylistic differences of the vocalists and through that offer each vocalist a moment when there individual talent can be appreciated and acknowledged.

CHANGES IN LITTLE VILLAGE

Vanessa Solis and Gary Sandefur (Mentor), Sociology

Every neighborhood undergoes cultural changes Changes that shape our lives beyond our control. Here I have examined a neighborhood called Little Village that has changed drastically from being a Polish and Czech neighborhood to a primarily Mexican American neighborhood. I have studied why these changes occurred, and how it has shaped individuals. With the use of the census, newspapers, scholarly books, pictures as well as interviews, I have been able to show how neighborhoods change and the effects they have on us. It is important to note that as much as neighborhoods change us we build them occurring to our culture, by drawing ourselves to areas that we can relate to, as well as a place that we can have a sense of feeling welcome and at home.

UNDERSTANDING CELL-MEDIATED IMMUNE RESPONSES AGAINST SIMIAN IMMUNODEFICIENCY VIRUS (SIV)

Sean Spencer and John Loffredo, David Watkins (Mentors), Primate Research Center

Each day 14,000 people become infected with HIV/AIDS, making the development of an effective vaccine one of the world's top public health priorities. David Watkins' laboratory is attempting to develop HIV vaccines that elicit cellular immune responses utilizing the simian immunodeficiency virus (SIV) - infected rhesus macaque animal model. A major component of the cell-mediated immune response are cytotoxic T-lymphocytes (CTL). It is thought that CTL play an important role in controlling HIV and SIV. Most standard immunological assays do not measure antiviral activity directly, limiting our understanding of CTL effectiveness. To address this, the Watkins laboratory developed a novel neutralization assay that quantifies the ability of virus-specific CTL populations to control viral growth. Evaluating the antiviral activity of CTL of different specificities will identify those CTL most effective against SIV. This information will likely impact the design of future HIV vaccines.

ANALYSIS OF THIN LIQUID FILM BEHAVIOR IN TWO-PHASE LIQUID-VAPOR FLOW

Benjamin Spike and Timothy Shedd (Mentor), Mechanical Engineering

The process of heat transfer through the interaction of liquid and vapor in a tube is frequently applied in modern-day heating and cooling systems. However, not enough is known about the basic mechanics of this process to create an accurate model. This study seeks to model how the behavior and thickness of liquid films are affected by liquid and vapor flow rates, which are both determining factors in the efficiency and affordability of modern heat transfer systems. A non-intrusive optical apparatus will be used to measure film thickness within a clear tube as air and liquid flow rates are varied. These values will be plotted and analyzed for mathematical trends that could serve as a model for both mechanical research and industrial design.

SATELLITE CLIMATOLOGICAL STUDIES IN ANTARCTICA

Jessica Staude and Steve Ackerman (Mentor), Atmospheric and Oceanic Sciences

Brutal storms and harsh winds are common in Antarctica. Because of their impact on operations, scientists have been conducting research to better understand the weather and climate of this harsh continent; however, the collection of weather observations has occurred at only sparsely scattered locations, mostly on the coast of the continent. Composite satellite observations have shown cloud masses advecting onto the Antarctic continent in preferred regions. These events have been labeled as Cloud Mass Transport (CMT) events. This study investigates temporal and spatial correlations between the satellite observations of the CMT events with model simulations, and observed climate indices. Evidence of a correlation suggests links between Antarctic weather and climate and may lead to improved forecasting around the continent.

BATCH PRODUCTION OF POLYSTYRENE CANTILEVERS FOR FORCE MICROSCOPY

Andrew Stevens and Daniel van der Weide, Charles Paulson (Mentors),
Electrical and Computer Engineering

To our knowledge, there are only a few reports on polymer-based Atomic Force Microscopy (AFM) cantilevers. Polymeric cantilevers present several advantages as compared to silicon; polymers can be chemically doped or functionalized, allowing new areas of research in force microscopy to be explored. The polystyrene cantilevers are cheaply and quickly produced in a non-cleanroom environment. They are more durable and more compliant (and thus more sensitive to force) than traditional silicon cantilevers and are electromagnetically insulating. A process for the batch fabrication of polystyrene cantilevers for use in atomic and magnetic force microscopy is described. The resonant properties and imaging capabilities of the cantilevers are also presented.

CHILDREN'S DEVELOPMENTAL UNDERSTANDING OF ETHNICITY AND RACE

Mary Streubel and Stephen Quintana (Mentor), Counseling Psycholog

Contributions to the Qualitative Research Team will include the interpretations and conclusions from multiple transcripts of Korean children and their developmental understanding of ethnicity and race. By investigating societal versus personal connotations toward culture and race, one has the ability to understand the influences caused by their respective environments. The differences can be seen according to each age group, ranging from preschool to adolescence.

THE TRANSLATION OF "OH"

Visar Sutaj and Larry Edgerton (Mentor), AAP

I am dedicating my research to a translation of Anton's novel "OH" from Albanian into English, and looking forward to accomplishing the whole project by the end of the spring. I have looked at his first pages and concluded a clear translation of complicated and sophisticated writing; Anton composes moderate sentences with details eloquent with reality, viewing with alacrity and morality in one absurd society. And the style motivates the reader to become a voice himself. Compared with other works of the 20th century, "OH" excludes the traditional convention of the novel. This classical novel permeates the history and reality and at the end the reader creates symbolic preferences related to his/her reality and life in general.

COMPARISON OF POTENTIAL CANCER CHEMOPREVENTIVE ACTIVITY BETWEEN CORN PRODUCTS

Tammy Tam and Kirk Parkin (Mentor), Fiday Chair of Vegetable Processing Research

Corn, comprised of a rich, diverse germplasm, is one of the most extensively grown, consumed and used vegetable/grain in many countries. Some preliminary studies have shown that corn isolates may confer anti-cancer benefits by its inducing effects on Phase II detoxification enzymes. Soxhlet Extraction is performed on milled corn products and the crude extract obtained is then separated into oily and aqueous phases by Solvent Partitioning. Then, Rotary Vacuum Evaporation is used to obtain completely dried extracts. Finally, a bioassay is done using Quinone-Reductase activator as a color indicator. After the results are recorded using a Spectrophometer, graphs will be plotted and quantitative comparisons will be made between the different corn product extracts studied. Hopefully, specific health-promoting corn components will be found in the long run. This could result in increased corn consumption, improvement in public health and agricultural sustainability.

BEHAVIORAL EFFECTS IN CHRONICALLY EXPOSED NORTHERN LEOPARD FROGS (RANA PIPIENS) TO HEAVY METALS

Michelle Tamez and Jackson Gross (Mentor), Wildlife Ecology

This study is the first to address the effects of environmentally relevant concentrations of heavy metals on predator avoidance in chronically dosed northern leopard frog tadpoles. We are testing the hypothesis that tadpoles exposed to cadmium chloride, lead nitrate, chromium trioxide and sodium arsenate will exhibit compromised refuge seeking behavior in the presence of a predator. Five animals were randomly selected from each treatment and control tank and total time spent in refugia in the presence and absence of a predator (crayfish) was tabulated. Though the results were not statistically significant ($P > 0.05$), we found that all treated animals except those dosed with cadmium, spent less time in refugia when compared to the control.

THE CULTURAL HISTORY OF THE HMONG PEOPLE IN ASIA AND THE U.S.

Kati Tehan and Marlys Macken (Mentor), Linguistics

This research project is designed to collect information that will help “Heritage Learners” of the Hmong language grow in knowledge about their culture’s history in Asia and in the U.S. “Heritage Learners” are second-generation Hmong-Americans who have not received formal education about the Hmong language or culture, but grew up in a Hmong household. Since their immigration to the U.S. after the Vietnam War, the Hmong have become a prominent ethnic group in Minnesota and Wisconsin. Their agricultural contributions were a driving force of the increased popularity of ginseng products in the 1980s and 1990s. We are collecting information from personal interviews, internet research, and library research. Ultimately, we will create a college-level curriculum in the Hmong language that will help “Heritage Learners” become better acquainted with their history, language, and culture.

LANDSCAPE CHANGE IN THE UPPER MINERAL POINT BRANCH WATERSHED, IOWA COUNTY, WISCONSIN, 1832–2004

Travis Tennesen and James Knox (Mentor), Geography

After the arrival of white settlers in the 1830’s, the Driftless Area of southwestern Wisconsin experienced waves of lead miners and farmers who dug up, bought, sold, fenced, and plowed the former prairie and oak savanna and fundamentally changed the character of the land. Today, as agriculture wanes and suburban houses begin to dot the landscape, it is important to reflect of the changes in hydrology, soils, and land-use that have occurred in the last 170 years. This paper closely examines the post-settlement history of the Upper Mineral Point Branch, a Driftless Area watershed just north of the 3rd oldest city in Wisconsin. Beginning with an analysis of the pre-settlement landscape using the 1832 land survey records, I focus on the impacts of agriculture on the streams, soils, and vegetation in the watershed and the recent trend of decreasing agricultural use and increased forest cover, conservation reserve land, and non-farming homes.

MAMMARY TUMOR AND HYPERPLASIA DEVELOPMENT AND PROGRESSION IN FVBxB6 MIN/+ AND B6 MIN/+ MICE

Rebecca Terlizzi and Amy Moser (Mentor), Human Oncology

Previous studies demonstrated that a mutant allele of adenomatous polyposis coli (Apc) gene (ApcMin), predisposes mice to develop hyperplasias and tumors of the mammary gland. The number and type of lesion induced by ethylnitrosourea (ENU), a chemical carcinogen, was dependent on genetic background. I studied the timing of development and progression of hyperplasias and tumors in two strains of mice, FVBxB6 Min/+ and B6 Min/+. Mammary glands were collected at various time points after ENU treatment and the number and types of lesions were enumerated. Knowing how genes affect the timing of development and progression of mammary tumors is a step towards developing future treatments against cancer.

HMONG PARENTS' AND CHILDREN'S PERCEPTION OF SCHOOL EXPERIENCES: A COMPARATIVE STUDY

Chai Thao and Jeffrey Lewis (Mentor), Human Development and Family Studies

The purpose of this study is to look at how Hmong parents and children perceive the child's educational experience. Three research questions will be posed: how do Hmong parents perceive their child's educational experience; how does the child perceived his or her own educational experience; and how do these two perceptions compare? This study will involve ten Hmong families living in the Kennedy Heights community, which is located in a mid-sized midwestern city. One-on-one interviews will be conducted with one parent and one child within each family. A content analysis will be conducted in order to identify salient themes and categories related to school experiences. The information provided from the results will be used by the Kennedy Heights Community Center to provide better services for their resident Hmong families.

FEMTOSECOND LASER

Say Thao and Marshall Onellion (Mentor), Physics

This research involves the use of a femtosecond laser system. This femtosecond laser is used to measure the carrier and spin dynamics in correlated electron materials. The femtosecond laser method used to start with a short pump pulse that put some energy into the electrons. At a controllably later time, a weaker probe pulse is used to measure the optical reflectivity, optical transmissivity, or the magneto-optic Kerr rotation angle or ellipticity. For the future, Professor Onellion hoped to find funding for the project which will be including the support for undergraduate research participation.

“JOURNEY TO SELMA” VIDEO AND ARCHIVAL RESEARCH

Laura Tollgaard, Stephanie Whiteaker and Tyina Steptoe (Mentor), History

Over the last four years, students and faculty from the University of Wisconsin have organized many service/learning trips to Alabama. Our research is an effort to produce a documentary relating the 1960's Civil Rights Movement to these several trips. Our research includes two different methods: archival research and the interviewing of trip participants. In creating the documentary, archival research must be conducted to gather information on the time period and locate media images from the Movement which may be utilized in the documentary. Relevant newspaper headlines were gathered from cities visited by trip participants. The next step in the process will be interviewing the students and faculty who have been involved with the trips. Once this portion of the project has been completed, the newspaper headlines and the interviews will be superimposed to create a visual and audio history to reveal how the trips themselves compose an element of Civil Rights Movement history.

THE SYNTHESIS OF THE GUANACASTEPENE SKELETON

Michael Tran and Daesung Lee (Mentor), Chemistry

This project seeks to synthesize the carbon skeleton of the Guanacastepene family of natural products. Of the fifteen members of the Guanacastepenes, A through O, two members, Guanacastepene A and I, have shown antibiotic activity against the drug resistant pathogens, methicillin-resistant *S. aureus* and vancomycin-resistant *E. faecalis*. Thus, the Guanacastepenes have potential as lead compounds for the development of new antibiotics to treat drug resistant pathogens. Our synthetic strategy to this previously unreported 5–7–6 tricyclic framework utilizes a Chiron approach where an oxygenated derivative of (-) — Verbenone as a key building block to set not only the required stereochemistry but also the connectivity of half of the natural product.

FINANCING ELECTIONS: THE CONSEQUENCES OF RECENT REFORM

Mary Triick and David Parker (Mentor), Political Science

My research explores the implications the new Bipartisan Campaign Finance Reform Act of 2002 (BCRA) and the ensuing Supreme Court decision (*McConnell v. FEC*) will have on the campaign strategies employed by political parties, candidates, and interest groups. Understanding these effects should aid policymakers in constructing future campaign finance regulations while avoiding unanticipated consequences. I employ qualitative research methods, which include examining both the law and the decision, reading editorial opinion pieces written by leading political actors, and analyzing current campaign advertisements, in order to postulate on the potential for change inherent in the new electoral rules.

THE ENTERIC NERVOUS SYSTEM: NEURONAL DIFFERENTIATION WITH RESPECT TO DEVELOPMENT IN THE CHICK EMBRYO

Lynn VanderWielen and Miles Epstein (Mentor), Anatomy

We are studying the development of the enteric nervous system of the chick embryo trying to understand the progression of the neural precursor cells and the time frame necessary before they commit to becoming neurons. Early in development, the enteric neural crest cells enter the pharynx, migrate, proliferate, and differentiate into neurons and glia. Our objective is to understand the conditions for the differentiation of these precursors and determine whether the neurons arise along a strand or at the convergence of strands. We will accomplish this by fixing the embryonic gut at various states of development, immunostaining them with the antibodies for the precursors (HNK-1) and the neurons (Hu), and viewing them with a fluorescence microscope.

EXOTIC GALAXIES: BARRED MAGELLANIC SPIRALS

Alex Viana and Eric Wilcots (Mentor), Astronomy

Barred Magellanic Spiral (SBm) type galaxies are classified by their unique and interesting physical appearance. Instead of the familiar “Pinwheel” shape, SBm galaxies have a prominent asymmetric bar of bright gas through their central axis. The complex phenomena that result SBm formation are not fully understood. Our research assesses the latest proposed theories behind this puzzling class of galaxies with such varied methods as ground based observation, image analysis and database searches.

POLITICAL DISSIDENTS IN CUBA TODAY

Kelsey Vidaillet and Humberto Vidaillet (Mentor), Volunteer Staff -
Cardiology

The purpose of this project is to analyze the most recent repression of human rights in Cuba with the imprisonment of 75 dissidents in March 2003. The rationale behind this project lies in the researcher's interests in learning about and exposing the oppression of Fidel Castro's regime. The methods for this research will be to review specific Amnesty International articles and other relevant sources to create a database in which to divide the dissidents by sex, race, age, profession, prison sentence, conviction, hometown, and location of imprisonment. The hope of this research will not only be to further examine this recent violation of human rights in Cuba, but to use this information to help other organizations and individuals dedicated to defending such basic freedoms.

THE GENETICS OF BONE STRENGTH IN MICE

Jonathan Vu and Robert Blank (Mentor), Endocrinology

The purpose of this study is to identify relationships between the physical and genetic characteristics of bones in mice. The physical characteristics include size, density, and the force required to break the bone, while the genetic ones are the genes of the marker loci associated with the genes that affect these qualities. This study uses strains of mice with reduced genetic variation. The two strains of mice that are the most phenotypically extreme, meaning those with the strongest and weakest bones, are crossed. The F2 generation from that cross is then analyzed. The results of this analysis can be used to find which genotypes correlate with specific bone properties like size, density, and failure load. The anticipated outcome of this lab is the identification of the genotypes that affect bone strength in mice. The findings may be useful in treating medical conditions that are related to bone strength.

HMONG JOURNEY TO AMERICA IN STORY CLOTH

Khou Vue and Marlys Macken (Mentor), Linguistics

The reason of this project is to teach other nationalities about the history of the Hmong people during the Vietnam War and their journey to America through the Hmong Story Cloth. The major components of the Hmong Story Cloth includes the Vietnam War, their journey from Laos to Thailand, life in the refugee camp of Thailand, journey to America, and background ethnicity. The goal of this project is to inform other nationalities what the Hmong people had to go through to get to America. The research is done by using the internet, book resources, and through personal interviews of Hmong elderly. Hopefully, other nationalities will learn the truth about the journeys of the Hmong people through the art of the Hmong Story Cloth.

QUANTIFYING THE ADHESION OF WILD-TYPE AND MUTANT CANDIDA ALBICANS TO COMMONLY USED BIOMATERIALS

Joel Wagner and Sean Palecek, Fang Li (Mentors), Chemical and Biological Engineering

This research project focuses on the role of cell-substrate adhesion during biofilm formation by the pathogenic fungus *Candida albicans*. Biofilms are structured microbial communities that are attached to a surface. Most microorganisms exist as biofilms rather than as free-floating cells. It has been estimated that 65% of all microbial infections involve biofilms, resulting in a 35% mortality rate for *Candida* infections. This project's goal is to characterize the binding of *C. albicans* to common biomaterials. If we can reduce adhesion, we can reduce virulence. Research includes both wild-type *C. albicans* and *C. albicans* mutants lacking adhesion receptors or signaling molecules involved in adhesion receptor regulation. The biomaterials studied include polymethylmethacrylate, polytetrafluoroethylene, silicone elastomer, and polyurethane. This study will lead to an understanding of both the cellular mechanisms and the material properties that best minimize biofilm formation.

HIGH RESOLUTION MAPPING OF THE CORNGRASS1 MUTANT IN MAIZE

Meghan Walters and Shawn Kaeppler (Mentor), Dep of Agronomy

The goal of this project is to conduct high resolution mapping to facilitate map-based cloning of the Corngrass 1 (Cg1) gene. Cg1 is a gene that plays a fundamental role in maize development. Approximately 900 individual plants have been scored for the Cg1 phenotype. Eighty samples are being used in the initial mapping, and the remaining samples will be used to resolve genetic markers tightly linked to the gene. Rice and maize have similar sequences so we are able predict other possible genes. The position has been limited to an area within a few markers. Once a region containing five or less genes is defined by recombination, sequencing, expression analysis, and transgenic studies will be used to confirm the Cg1 gene. The goal of my project is to map Cg1 to a location containing five or less genes.

REGULATION OF BZLF1- PROMOTER IN THE EPSTEIN BARR VIRUS BY ZEB PROTEINS

Zhenxun Wang and Xianming Yu (Mentor), Oncology

The Epstein-Barr virus is estimated to infect up to 90 percent of the world population. Primary infection occurs in the oropharyngeal epithelium, but EBV can also infect B-lymphocytes. The life cycle of EBV in B-lymphocytes is characterized by a latent and lytic phase. There has been correlation between EBV infection and a number of cancers. The switch from latent phase to lytic phase is initiated by the transcription of BZLF1 gene and the subsequent translation of the gene product, which acts as an activator of viral genes required for lytic replication. ZEB-1, previously thought to only play a role in muscle differentiation, was recently found to inhibit the transcription of BZLF-1 gene. The project is to determine whether ZEB-2, a related protein with high sequence homology to certain regions of ZEB-1, plays the same role as ZEB-1 in the regulation of the BZLF-1 gene.

ACTIVATION OF KENNER'S N-ACYLSULFONAMIDE "SAFETY-CATCH" LINKER USING Pd(0) CATALYZED ALLYLATION

Jesse Wilkins and Laura Kiessling (Mentor), Chemistry

Many peptides and their derivatives have important biological functions such as hormones, growth factors, and toxins. The synthesis of peptides and their derivatives plays a crucial role in answering many biological questions. The N-acylsulfonamide "safety catch" linker is commonly used for the synthesis of small peptides and peptide derivatives. However, it is currently activated under harsh, basic conditions which limit the range of compatible compounds. This study investigates a novel activation method for the N-acylsulfonamide "safety catch" linker under mild, neutral conditions which will greatly increase the range of compatible compounds for this particular linker. We believe a palladium(0) catalyzed allylation will selectively activate the N-acylsulfonamide linker, allowing compounds to be easily and stoichiometrically cleaved from the solid support.

THE PERCEPTUAL AND BEHAVIORAL OF DAVIDSON'S THIRD PERSON PERCEPTION HYPOTHESIS

Bonnie Williams and Doug McLeod (Mentor), journalism

Concern about potential harmful effects of violent videogames has recently led some critics to call for censorship to protect the public. As such, this situation lends itself to the study of the perceptual and behavioral components of Davidson's third-person effect hypothesis. This hypothesis states that people perceives violence in video games to have a greater impact on others than on themselves (perceptual component), and that these perceptions lead people to take actions, such as censorship, to prevent the impact (behavioral component. An Internet-based survey was conducted on Journalism and Communication Arts students to examine the antecedents and consequences of the perceived effects of playing videogames. Our analysis focuses on the impact of gender, political orientation and paternalistic lineage between these factors and support for government action regarding such videogames.

THE EFFECT OF EARLY EXPERIENCE ON CORTICAL BRAIN DEVELOPMENT: THE CASE OF INSTITUTIONAL CARE GIVING

Kiyana Williams and Seth Pollak (Mentor), Psychology

Researchers examined associations among early institutional caregiving, aspects of brain organization, and internalizing and externalizing symptoms. Adolescents who experienced institutional care giving prior to adoption in the United States (PI children) were compared with demographically matched controls. The Edinburgh Handedness Inventory indexed lateral dominance; language evoked brain activity was quantified by the P300 event related potential (ERP) and frontal negativities were recorded during a working memory task. PI children demonstrated elevated incidence of eye-hand cross dominance, increased anxiety, and behavioral problems. Eye-hand cross-dominant PI children demonstrated an aberrant ERP topography, more social and physical neglect, depression, and cognitive delay. These findings suggest left hemisphere dysfunction may be an important correlate of extreme neglect, and will guide future research into the vulnerability of the developing brain.

EYE GAZE AVERSION IN FRAGILE X SYNDROME AND DOWN SYNDROME

Steven Wong and Melissa Murphy (Mentor), Communications Processes Unit

Eye gaze is an important part of social interaction. It can show emotion and display interest. Avoidance of direct eye contact has social and educational implications. For example, lack of eye contact at certain points can signal disinterest and make entry into social interaction hard. Individuals with fragile X syndrome (FXS), the leading inherited cause of mental retardation, have difficulty establishing and maintaining eye contact. Gaze aversion in FXS is considered to be a maladaptive behavioral result of social anxiety. A different theory suggests that gaze aversion may serve a functional purpose. The goal of this project is to examine factors that contribute to gaze aversion. Three groups will participate: adolescents with FXS, adolescents with Down syndrome, and typically developing children. Each participant completes a computerized labeling and synonym task to assess the effect of social demands and task difficulty on eye gaze. Implications for intervention will be discussed.

HOPE LOST

Mai Phia Xiong and Marlys Macken (Mentor), Linguistics

This research involves the Hmong people of the jungle of Laos that are known as the “resistance fighters” or “freedom fighters”. From a prior research done under Dr. Marlys Macken showed that these people helped the United States fight the Vietnam War. Unfortunately, these freedom fighters were left behind when the United States withdrawal from Vietnam. For safety, they have to hide in jungles in escape from the Laotian Government. These people have been hiding for twenty-eight years and now the truth of their existence is finally being revealed to the world. This research focuses on the freedom fighter to the position in which they are in today. The research was done by using several resources including the internet, Fact Finding Commissions, National Amnesty, Vientiane Time, and through personal interviews. Hopefully, this research will allow us to learn more about these people and to inform the world of their sufferings.

CONFLICT OVER APPEARANCE: PEERS VS. PARENTS

Panhia Yang and Laurie Ellis McLeod (Mentor), Human Development and Family Studies

This project is the third wave of a larger study conducted by Dr. Laurie McLeod, which looks at the competing pressures from parents and peers regarding appearance and how it affects the adolescent. The purpose of this specific project is to examine whether racial ethnicity and socioeconomic status are related to an adolescent’s satisfaction with his or her appearance. The findings from this self-reported survey of 6th, 7th and 8th graders will contribute to the growing knowledge about the clothed and physical body image from the perspectives of early adolescents.

NETWORK TOMOGRAPHY FROM ROUND TRIP TIME MEASUREMENTS

Mehmet Yildiz and Robert Nowak (Mentor), Electrical Engineering

The decentralized nature of the Internet's administration and control make several tasks including network mapping, congestion control, and early attack and worm detections extremely challenging. Network tomography is an exciting new field of research that allows one to reconstruct the internal structure and workings of the Internet based on simple probing and measurement schemes using personal computers. In this project, we aim to develop a new technique for network tomography based on the time it takes to send a message from one computer to another and back again (round-trip time). This will greatly simplify the process and make it much more practical, since it allows one to perform network tomography with a single personal computer connected to the Internet. Furthermore, we will investigate the potential of our new approach for detecting network congestion.

CHILDREN'S SOCIAL COGNITIVE DEVELOPMENT

Selamawit Zewdie and CHRISTOPHER LAWSON (Mentor), WAISMAN CENTER

A major goal of studies in social cognition has been to understand how children develop concepts about other people. A central element in reasoning about other people is thinking about their rights and responsibilities. This study explores children's (4- and 8- year olds) understanding of different kinds of social categories (e.g. Mother, Doctor, Bully). In particular what makes someone a member of a social category? Are certain properties more central to being a member of a category? We are investigating three kinds of properties: Deontic (obligations/rights), Psychological (likes/preferences), and Behavioral (actions). Do children think a person is a doctor because they have to, they like to, or just because they usually do help sick people? We expect that younger children will categorize individuals based on preferences while older children will categorize individuals based on obligation.

MATRIX OPTIMIZATION FOR MALDI FTMS FOR PEPTIDE IDENTIFICATION

Mingzi Zhang and Lingjun Li (Mentor), Pharmacy

In the nervous systems, neuropeptides are very important for the initiation, modulation and regulation of many physiological processes in the nervous system. For this study of neuropeptides, a matrix-assisted laser desorption/ionization (MALDI) Fourier transform mass spectrometer (FTMS) was used, enabling rapid detection and identification of neuropeptides. To identify an analyte, a sample must be cocrystallized with a matrix that absorbs laser energy and transfers that energy to the analyte molecules, ionizing and desorbing them. Depending on the type of matrix used, the fragmentation and ionization efficiency of the analyte ion may differ. My objective is to experiment with different matrices to find a matrix that will optimize the ionization process and improve efficiency in identifying and sequencing neuropeptides using MALDI FTMS.



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