

Undergraduate Symposium 2006

Celebrating Research, Creative Endeavor and Service-Learning

University of Wisconsin–Madison Memorial Union

April 11, 2006

- 9:45 a.m. Welcome to Student Participants,
by Associate Vice Chancellor Virginia Sapiro,
Great Hall
- 10:00 a.m.–4:00 p.m. Posters and Art/Research displays, Great Hall
- 10:00 a.m.–11:30 a.m. Oral Presentations, Session I
(see signs or registration table on 4th floor
for specific student presentation times and
locations)
- 12:00 p.m.–1:30 p.m. Oral Presentation, Session II
- 2:00 p.m.–3:30 p.m. Oral Presentations, Session III

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

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Celebrating Research, Creative Endeavor and Service-Learning

*University of Wisconsin – Madison
April 11, 2006*

The eighth annual Undergraduate Symposium is a celebration of undergraduate students' accomplishments across the many Schools and Colleges at UW–Madison. The Symposium includes oral and poster presentations by groups and individuals representing the arts and humanities, biological sciences, physical sciences, and social sciences. These original works showcase the vast range of talent and creativity within the University's undergraduate population.

The eighth 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, the Writing Center, and The Wisconsin Union.

A Special Thanks!

We would like to thank the Undergraduate Research Scholars Program for giving the 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 thanks is also extended to Ruthi Duval and Jennifer Fannuci of The Wisconsin Union; Andrea Benton and Melissa Tedrowe of the Writing Center; Nancy Brower, Tricia Dickinson, Linda Kietzer, Nancy Rinehart, and Nick Weaver, at University Communications; and Mike Tessmer of the Division of Information Technology.

2006 Undergraduate Symposium Organizing Committee:

Andrea Benton, Jane Harris Cramer, Tricia Dickinson, Laurie Mayberry, Emilie Hofacker, Virginia Sapiro, Akua Sarr, Randy Wallar, Maya Holtzman, Melissa Tedrowe, Janice Rice, Svetlana Karpe.

Cover photos by Michael Forster Rothbart and Jeff Miller, Office of University Communications

Student	Major	Mentor(s); Department
Algiers, Timothy	Biochemistry	Jeff Hardin; Zoology
Allen, Ashley	English	Lorrie Moore; English
Ang, SiangYun	Biochemistry	Wei Xu; Oncology
Antone, Whitney	Sociology	Daniel Long; Sociology
Armena, Ketchum	English/Philosophy	Melissa Tedrowe; English
Bartula, Renata	Mechanical	Scott Sanders; Mechanical Engineering
Baus, Anne	Mechanical Engineering	Heidi Ploeg; Mechanical Engineering
Beers, Donnie	Biochemistry	Jayne Squirrel; Molecular Biology
Bergquist, Rachael	Medical Microbiology and Immunology	Julia Wilbarger; Kinesiology, Occupational Therapy Program
Biaggio, Brittany	Biology	Steven Lindheim; Obstetrics and Gynecology
Bienkowska, Dominika	Molecular Biology	Jayne Squirrel; Molecular Biology
Bjork, Kevin	Nursing	Linda Denise Oakley; Nursing
<i>Team project</i>		
Blomker, Jonathan	Physics, Math, and Astronomy	Julien Clinton Sprott; Physics
Maus, Adam	Computer Science	
Bowman, Anne	Political Science	Clark Miller; LaFollette School of Public Affairs
Brazgel, Zachary	Pre-Pharmacy	Betty Chewning; Pharmacy
Broz, Carrie	Biology	Toni Ziegler; Psychology
Carbonell, Maria	Communication Arts	Karen P. Goebel;
Cayemberg, Crystal	Business	Loren Kuzuhara; Management and Human Resources
<i>Team project</i>		
Cerf, Catherine	Nursing	Susan Heidrich; Nursing
Lehman, Krista	Nursing	
Chang, Shee	Nursing	Linda Denise Oakley; School of Nursing
Chokdee, Darin	Pharmacy	Stefanie Halverson; Management and Human Resources
Chokdee, Darin	Pharmacy	Stefanie Halverson; Management and Human Resources
Christensen, Karina	Nursing	Linda Baumann; nursing
Cohen, Jamie	Communication Arts	Raymond Kessel; Medical Genetics and Professional Development
Condon, Emma	International Studies	Aili Tripp; Political Science and Women's Studies
Cornale, Samuel	Undecided	Robert Blank; Endocrinology
Cottrell, Courtney	Anthropology	Kathryn Sanchez; Spanish and Portuguese Women's Studies Program
Crenshaw, Erica	Pre-medicine and Journalism	Susan Pastor; Women's Studies
<i>Team project</i>		
Crone, Melissa	Human Development and Family Studies, Psychology	Julie Poehlmann; Human Development and Family Studies
Diercks, Laura	Human Development and Family Studies, Psychology	
Hahn, Emily	Human Development and Family Studies, Music	
Curry, Samantha	Pre-pharmacy	Harold Scheub; African Languages and Literature
Czarny, Matthew	Molecular Biology	Henry Pitot; Oncology

Student	Major	Mentor(s); Department
<i>Team project</i>		
Delgado, Cassie	Spanish	Mark Brownfield; Comparative Biosciences
Mellenthin, Ashley	Nutritional Sciences	
Demmer, Tara	Medical Microbiology and Immunology	Vladimir Spiegelman; Dermatology
<i>Team project</i>		
Diem, Bridget	Astrophysics	Peter Timbie; Physics
Jones, Kristen	Physics	
Noble, Allison	Physics	
Drilias, Elizabeth	Economics	Amir Assadi; Mathematics
<i>Team project</i>		
Duckert, Kaitlyn	Nursing	John Ferrick; International Programs
Klink, Jenna	Biology	
O'Neil, Callie	Zoology	
Stepaniak, Abby	Rehabilitation Psychology	
Dwyer, Kelly	Political Science	Richard Brooks; Professional Development and Applied Studies
Ellis, Shanequa	Political Science	Stefanie Halverson; Management
<i>Team project</i>		
Enters, Lindsay	Social Work	Gerry Campbell; Agricultural and Applied Economics
Mergen, Rebecca	Economics	
Eshete, Alula	Psychology	Daniel Long; Sociology
Fahrenholtz, Cale	Pharmacology and Toxicology	Darin Furgeson; Pharmaceutical Sciences
Flores, Katrina	Chinese	YongPing Zhu; East Asian Languages and Literature
Fortin, Sarah	Undecided	Susan Paddock; Professional Development and Applied Studies
Friant, Sagan	Anthropology and Biological Aspects of Conservation	Charles Snowdon; Psychology/ Zoology
Gonzalez, Jason	Legal Studies	Irene Katele; Legal Studies
Griffing, Sheridan	Undecided	Marlys Macken; Linguistics
<i>Team project</i>		
Haertel, Andrew	Zoology	Marina Emborg; Anatomy
Loerch, Stacy	Undecided	
<i>Team project</i>		
Hahn, Emily	Human Development and Family Studies	Julie Poehlmann; Human Development and Family Studies
Palomino, Vanessa	Human Development and Family Studies	
Hall, Kayla	Marketing	Stephanie Halverson; Social Sciences: Business/Psychology
Harvey, Christopher	Genetics	Maria Christina Suarez-Rodriguez; Horticulture

Student	Major	Mentor(s); Department
Hasan, Ayesha	Biology	Nathan Welham ; Surgery
Hau, Hannah	Nursing	Kristine Kwekkeboom, PhD RN; Academic and Student Services
Heeren, Alexander	Zoology	Michelle Harris; Biocore
Her, Yeng	Chemistry	Ben Shen; Pharmaceutical Sciences
Hirschtritt, Zachary	Biological Aspects of Conservation	Rebecca Kagle; Land Resources
Hoegger, Mark J.	Biochemistry	Leonard A. Levin; Ophthalmology and Visual Science
Hoffmann, Sarah	Biology	David Abbott; Department of Obstetrics and Gynecology
<i>Team project</i>		
Holmes, Sarah	Vocal Education	Amir Assadi; Mathematics
Jensen, Richard	Biochemistry	
Homer, Jennifer	Biology	Geraldine Loughnon; Agronomy
Hudson, Dan	History	Christopher Day; Botany
Hussain, Muzammil	Journalism and Mass Communication	Douglas McLeod; Journalism and Mass Communication
Ikanih, Atherine	Pre-Nursing	Paul Van Ginkel; Ophthalmology and Visual Sciences
Ingham, Anika	Psychology	Charles Kalish; Educational Psychology
<i>Team project</i>		
Ishida, Keiko	Biochemistry	Quentin Carpenter; Institute For Environmental Studies
Ishida, Tomotsugu	Biology	
Jacoby, Jason	Biochemistry	Paul Bertics; Biomolecular Chemistry
Jennifer, Bernstein	Women's Studies	Leann Tigges; Rural Sociology
Johnsen, Erik	Environmental Studies,	Stuart Wooley; Entomology
Johnson, Carey	Nursing	Dorothy Lanuza; Nursing
Jubert, Nicholas	Biology	Ei Terasawa; Primate Research Center
Kaiser, Eric	Molecular Biology	Janet Batzli; Interdisciplinary Instruction Program - Natural Science
Kang, David	Psychology and Chemistry	Chris Lawson; Educational Psychology
Kenner, Sarah	Undecided	Kathryn Sanchez; Spanish and Portuguese
Kohn, Craig	Agricultural and Biological Education	Gary Lake; Life Sciences Communication
Konrad, Annika	English	Kathryn Sanchez; Spanish & Portuguese
Kothari, Anai	Molecular Biology	Robert Landick; Bacteriology
Krause, Melanie	Nursing	Barbara Bowers; School of Nursing
<i>Team project</i>		
Kressel, Lucas	Biology	Eugene Kaji; Medicine
Kuehn, Carly	Undecided	
Kroes, Desiree	Psychology and Pre-Med	Laura Fillingame; Counseling Psychology
Krohn, Weston	Nursing	Sandra Ward; Nursing
Kuehl, Adrienne	Civil and Environmental	Peter Bosscher; Civil & Environmental Engineering
Kumar, Ashok	Languages and Cultures of Asia	Joseph Elder; Sociology, LCA
Kurt, Prins	Kinesiology	James Ervasti; Physiology
Lee, Jae	Biochemistry	John Rudolph; Curriculum and Instruction

Student	Major	Mentor(s); Department
LeGault, Laura	Mathematics	Amir Assadi; Mathematics
Levene, Katelyn	undecided	Jean-Michel Ane; Agronomy
Lewien, Elijah	Political Science	David Canon; Political Science
Lezama, Marty	Business	Stefanie Halverson; Business
Lopez, Erika	Political Science; Economics; International Studies	Clark Miller; LaFollette School Of Public Affairs
Luchsinger, Robert	Biochemistry	Stefanie Halverson ; Women's Studies
Ludeman, Lindsay	Genetics	Audrey Trainor; Rehabilitative Psychology
Lund, Peder	Medical Microbiology and Immunology	Pieter Johnson; Zoology
Maas, Kelly	Nursing	Mary Ellen Murray; Nursing
<i>Team project</i>		
Maki, Abby	Mathematics	Amir Assadi; Mathematics
Wanchoo, Sheshali	Biology	
Marg-Patton, Carmen	Political Science, Philosophy	Scott Straus; Political Science
Martin, Chelsea	Biology	Geraldine Loughon; Agronomy
Martinez, Kevin	Biomedical Engineering	Aquilla Turk; Neurological Surgery
Martinez, Carlos	Pharm. M.D.	Craig Werner; Liberal Studies and the Arts
Mason, Michael	Political Science	Nina Emerson; Law
McChesney, Shannon	Spanish	Gurwattan Miranpuri; Neurological Surgery
Merrick, Melissa	Nursing	Susan Riesch; Nursing
Mess, Timothy	Undecided	Mike Madritch; Entomology
Meyer, Matthew	Wildlife Ecology	Jason Gross; Wildlife Ecology
Mogahed, Mona	Communication Arts (Rhetoric)	Christine Garlough; Communication Arts
Mueller, Samantha	Pre-Pharmacy	Jason Gross; Wildlife Ecology
Nagy, Samantha	Wildlife Ecology	Jason Gross; Wildlife Ecology
Nakanishi-Stanis, Erica	Anthropology	Sarah Atis; Languages and Cultures of Asia
<i>Team project</i>		
Nault, Rebecca	Child Development	Julie Poehlmann; Human Development and Family Studies
Sheridan, Laura	Child Development	
Nelson, Joseph	Math	Amir Assadi; Math
Nick, Zaban	Biochemistry	Xiaofeng Wang; Institute for Molecular Virology
Niebuhr, Emily	AOS	Matthew Hitchman; AOS
North, Melanie	Undecided	Audret Tluczek; School of Nursing
O'Brien, Karen	Interior Design	Suzanne Scott; Environment, Textiles, and Design
Oldenburg, Joseph	Mathematics	Amir Assadi; Mathematics
O'Leary, Claire	Molecular Biology	Brad Binder; Botany
Olsen, Amy	Undecided	James Ferris; Communication Arts
Olson, Brittney	Genetics	Marilyn Essex; Psychiatry
Orozco, Angelina	Genetics	Jamey Weichert ; Radiology
Patel, Ami	Pre-Medicine	Gurwattan Miranpuri; Neurological Surgery
Patel, Poonam	Political Science	Shana Lavin; Wildlife Ecology
Pelsue, Danielle	Psychology	Erik Carter; Rehabilitation Psychology and Special Education

Student	Major	Mentor(s); Department
Pendley, Chad	Biochemistry	Mark Richards; Animal Science
Pérez-Reyes, Nadya	International Studies; and - Latin American, Caribbean, and Iberian Studies (LACIS)	Francisco Scarano; History
Pesa, Stephanie	Communicative Disorders	Ruth Litovsky; Communicative Disorders, Psychology
Pesko, Matt	Special Education	Erik Carter; Rehabilitation Psychology and Special
Pierce, David	Biology	Vladimir Spiegelman; Dermatology
Pittner, Christa	Biochemistry	Pamela Kling; Pediatrics
Prahl, Lili	Wildlife Ecology	Jackson Gross; Wildlife Ecology
Prasad, Vijay	Neurobiology	Paul Laeseke; Radiology Research
Pritzl, Bridget	Human Development and Family Studies	Amy Jo Miller Schwichtenberg; Human Development and Family Studies
Pyatskowitz, Andrew	Economics	Eliot Mason; School of Business
Rasmussen, Adam	Undecided	Michelle Harris; Biocore
Remshak, Nicholas	Management & Human Resources	Loren Kuzuhara; Management and Human Resources
Rivera, Nathan	General Business	Amy Ellis; of Education
Roberts, Katie	Nursing	Mary Hayney; Pharmacy
Rodgers, Rodney	Wildlife Ecology	Jackson Gross ; Wildlife Ecology
Rosario, Jade	Undecided	Audrey Tluczek; Psychiatry
Roth, Aleeza	Chemistry	Lauren Trepanier; Medical Sciences
Ruiz, Alma	Undecided	Sherrill Sellers; Social Work
Saeed, Sarah	Biology	Mark Brownfield; Department of Comparative Biosciences
Sanchez, Vanessa	Microbiology	Sherrill Sellers; Social Work
Sanchez, Sarah	Biology	Chuck Kalish; Educational Psychology
Sanford, Theo	Genetics	Aseem Ansari; Biochemistry
Sapiro, Jessica	Nutritional Sciences	Roger A Sunde; Nutritional Sciences
Savengseuksa, Vorada	Genetics	Carol Fassbinder-Orth; Zoology
Schairer, Taya	Biology	Edd Taylor; Curriculum and Instruction
Schimek, Ariel	Medical Microbiology and Immunology	Nick Balster; Soil Science
Schmitt, Patrick	Anthropology and Spanish	Jonathan Kenoyer; Anthropology
Segal, Aliza	Botany	Don Waller; Botany
<i>Team project</i>		
Setala, Ashley	French	Eugene Kaji; Cardiology
Umnus, Amy	nursing	
Shapiro, Tamara	International Studies	Mary Layoun; Comparative Literature
Shapiro, Rebecca	Physics	Daniel Den Hartog; Physics
<i>Team project</i>		
Sharma, Shefaali	Psychology	Don Porter; Statistics
Zitzer, Nina	Biology	
Shaver, Alesha	Kinesiology	Mari Palta; Population Health Sciences

Student	Major	Mentor(s); Department
Sheth, Neha	International Studies	Kathy Cramer Walsh; Political Science
Skirnyk, Kateryna	Nursing	Rebecca Muehrer; Nursing
Sona, Son	Biochemistry	Huifang Xu; Geology and Geophysics
Soundarrajan, Malini	Biomedical Engineering	Curtis Olson; Office of Continuing Professional Development
Spencer, Sean	Medical Microbiology and Immunology	David Watkins; Pathology and Laboratory Medicine
Steingraber, Maggie	Nursing	Linda Baumann; Nursing
Stern, Emily	Communication Arts and Sociology	Fred Bradley; MS & E
Stong, Nicholas	Molecular Biology	Amir Assadi; Mathematics
Strauss, Rebecca	Psychology	Stefanie Halverson; Business
Strock, Bradley	Computer Science	Kurt Squire; Curriculum and Instruction
Tamez, Michelle	Wildlife Ecology	Te-Hao Chen; Wildlife Ecology
Thaker, Preeti	Undecided	Nasia Safdar; Infectious Diseases
Theama, Anita	Nerubiology	Nasia Safdar; Infectious Diseases
Thornton, Andrew	Biology	Ellen Batchelder; Anatomy
Thy, Vo	Women's Studies	Alfonso Morales; Sociology
Tilghman, Jessica	Biology	Gurwattan Miranpuri; Neurosurgery
Truong, Jonathan	Southeast Asian Studies/ Biochemistry	Michitake Aso; History of Science
VanderWielen, Beth	Medical Microbiology and Immunology/ Japanese	Lauren Trepanier; Medical Science
Velez, Aixa	Journalism and Mass Communication	Douglas McLeod; Journalism and Mass Communication
Vest, Lance	History	Craig Werner; Afro-American Studies
Vidaillet, Kelsey	Spanish and Latin American, Caribbean & Iberian Studies (LACIS), and Global Cultures Certificate	Greg Downey; Journalism and Mass Communication
Vo, Connie	Pre-Pharmacy	Jean-Michel Ane; Agronomy
Wagner, Joel	Chemical Engineering	Sean Palecek; Chemical and Biological Engineering
Wagner, Ryan	Biochemistry and Chemistry	James Dahlberg; Biomolecular Chemistry
Watanabe, Lisa	Bacteriology	Jorge Escalante-Semerena; Bacteriology
Weber, Rose	BSN	Kristine Kwekkeboom; School of Nursing
Wesley, Jessica	Communication Arts	Stefanie Halverson; Department of Management
White, Christopher	Undecided	Alfonso Morales; Sociology
Wong, Charles	History	Mary Roberts; History
Wysocki, Calvin	Chemistry	Steven Burke; Chemistry
Xaypharath, Joe	Pharmacy	Laura Saunders; Professional Develop & Applied Studies Family Studies
Xiong, Lee	Actuarial Science	David Noyce; Civil and Environmental Engineering
Yale, Rebecca	Math	Amir Assadi; Mathematics
Yang, Nhiale	Psychology	Mark Nelson; Environment Textile and Design
Yucebay, Filiz	Biology	Stefanie K. Halverson; Women's Studies Program

A STUDY OF WEST NILE VIRUS IN AVIAN GUT PHYSIOLOGY AND MUSOCAL IMMUNOLOGY

Vorada Savengseuksa, and Carol Fassbinder-Orth (Mentor),
Zoology

In 1999, the spread of the West Nile (WN) virus in the U.S. caused large populations of wildlife and people to be infected. A non-infectious envelope protein of the West Nile (WN) virus is used for our assays on white leghorn chickens. The use of oral and intramuscular adjuvants will increase antigenic response. Weekly blood and excreta samples will be collected from four different groups. These samples will be assayed for specific humoral and cell-mediated immune responses. At 10 weeks, the chicks will be euthanized and intestinal tissue will be examined for enzyme kinetics and immunological tests. Our hypothesis affirms the chickens' immune responses will increase in effect to the WN protein. A better understanding of the immune responses of the birds to WN virus may lead to improved methods of prevention in birds and possibly other vertebrates.

ACOUSTIC RECOGNITION

Sarah Holmes, Richard Jensen, and Amir Assadi (Mentor), Mathematics

The goal of this project is to devise an algorithm that correctly matches a bit of recorded melody, possibly sung, hummed, or played instrumentally, to a song or other audio data. The recorded bit need not be of any certain length, but the longer the sample of data, the more accurate the results should be. This will be accomplished using a combination of methods based in differential geometry, probability, and artificial intelligence. The knowledge gleaned from this research could potentially be extensible to other types of sound recognition such as identifying bird and other animal calls, and human speech recognition. Possible applications for such an algorithm include studying whale calls, identifying birds by their call, and searching a song database based on the melody.

ADOLESCENTS' PERCEPTIONS OF PEER INFLUENCE ON ROMANTIC RELATIONSHIPS

Catherine Cerf, Krista Lehman, and Susan HEIDRICH (Mentor), Nursing

Perceptions of peer group members greatly affect romantic relationships during adolescence, yet little is known about how adolescents think about this peer influence. To explore this notion, a descriptive design was employed. Fifty-seven eighth graders in an urban, public middle school responded to an anonymous questionnaire containing open- and closed-ended questions about eighth grade romantic relationships. Descriptive statistical and content analysis results indicated that $\frac{2}{3}$ of participants perceived that "some" of their friends were in a romantic relationship. Nearly $\frac{1}{3}$ perceived that their peers encourage relationship involvement and report concern for friend's happiness as the greatest motivation for this encouragement. Peer influence greatly shapes romantic relationships and should be considered in interventions aimed to promote healthy relationships.

AMATEURISM LEVELS IN THE UNITED STATES CONGRESS POST-1988

Elijah Lewien, and David Canon (Mentor), Political Science

Amateurism, defined as a lack of prior political experience, was first fully addressed as an integral component of Ambition Theory, the theory that asserts why a politician runs for office, by Professor David Canon, in his 1990 "Actors, Athletes, and Astronauts: Political Amateurs in the United States Congress." The purpose of this research is to specifically retest conclusions reached during Canon's pre-1988 empirical analysis of amateurism in the U.S. Congress. Methods generated in the pre-1988 study will be reused to examine post-1988 U.S. Congress data. If results affirm previously drawn conclusions, political science will be closer to understanding how amateurism affects Ambition Theory. Concurrently, efforts may shift to studying amateurism in United States governorships, and other political paradigms.

AN APPLICATION OF COMPLEX DYNAMICAL SYSTEM THEORY TO FOREIGN CURRENCY EXCHANGE RATES

Elizabeth Drilias, and Amir Assadi (Mentor), Mathematics

Our goal for this project is to take exchange rate data and, using the tools of statistics and dynamical system theory, find a set of equations or rules that govern the system. We used statistical smoothing to approximate daily data into a function with suitable analytic properties. We introduced a new concept of “catastrophe” for complex dynamical systems, and used it to find lengths over which predictions of behavior can correctly be made. We examined Japanese/U.S. exchange rates before and after a tumultuous week in the market. We found regular behavior before the “catastrophe” and great uncertainty afterward. Our research provides a new scheme for evaluating the behavior of international currency markets and the significance of “catastrophic” events.

AN EMPIRICAL STUDY OF THE CAREER PATHS AND DEVELOPMENT OF EXECUTIVES IN THE HEALTH CARE INDUSTRY

Crystal Cayemberg, and Loren Kuzuhara (Mentor), Management and Human Resources

The objectives of this study were to identify and understand the career paths of current healthcare executives from college to their current positions as department heads, administrators, and CEOs, and to determine what it takes to become a successful healthcare executive. Data were collected using a combination of structured interviews and surveys. Results will provide a basis for developing successful academic, job, and career strategies for an aspiring healthcare executive. Specifically, results will identify projected career avenues, tips, practical implications for schooling options, and personality traits beneficial for individuals interested in this field.

AN INVESTIGATION OF REAL WORLD CHALLENGES EXPERIENCED BY RECENT BUSINESS SCHOOL GRADUATES

Nicholas Remshak, and Loren Kuzuhara (Mentor),
Management and Human Resources

The primary objective of this research study was to identify the various challenges that recent graduates of the UW–Madison School of Business have encountered while working in their current jobs in real world organizations. A secondary objective was to utilize these real-world challenges as the basis for developing teaching tools and curricula to better prepare current business students for their future careers. A further comparison was made between challenges current students expected to encounter in the real-world and what was actually experienced by recent graduates. This was accomplished through the use of in-depth surveys as well as telephone interviews. Key results will be presented along with practical implications for the academic training of future business students and their professional and career development.

ANALYSIS OF FEMALE SEXUALITY IN TEENAGE WOMEN’S MAGAZINES

Erica Crenshaw, and Susan Pastor (Mentor), Women’s Studies

The current research critiques content related to feminine sexuality found within teenage women’s magazines (specifically Seventeen magazine and urban-targeted magazines). Some of the prevalent messages and topics that were open-coded included themes on homosexuality, dating, sexual pleasure, pregnancy, and contraception. In critiquing the constructs and messages within these magazines (including but not limited to race-related themes and trends) it is necessary to compare the content found within Seventeen magazine, a magazine targeted to a white middle-class young female audience with the content found within black female urban-targeted magazines such as Essence and Ebony. It is also necessary to include literature from other authors who have concentrated on some of the themes and trends used in this research. I expect to find more race and class related to the undesirable aspects of pregnancy, promiscuity, and motherhood within Seventeen magazine.

ANALYZING THE ROLE OF TWO NOVEL GENES IN ER AND MITOTIC SPINDLE ORGANIZATION IN NEMATODE EMBRYOS.

Dominika Bienkowska, and Jayne Squirrell (Mentor),
Molecular Biology

The mitotic spindle plays a key role in cell division. I am proposing to assess the role of two genes, Y57G11C.37 and F56A8.1, in early nematode embryo development. I will use multiphoton microscopy to assess the effects of depleting these gene products by RNAi on ER morphology and microtubule organization. Disruption of these genes may affect embryo viability, ER morphology and spindle organization since their homologue in flies, *Axs*, plays a role in ER organization on the spindle. The goal of this study is to understand the role of ER dynamics in cell cleavage.

APOPTOSIS IN RESPONSE TO BETA-LAPACHONE TREATMENT

Autherine Ikanih, and Paul Van Ginkel (Mentor),
Ophthalmology and Visual Sciences

Beta-Lapachone is a tricyclic pyrano-orthonaphthoquinone compound. Beta-Lapachone induces cell death, however, the mechanism of cell death is not well understood. In this study, I will determine the number of apoptotic cultured cancer cells, in response to the drug Beta-Lapachone. Calpain plays a role in cell death and functions as a calcium dependent protease and can be used to measure cleavage of target proteins. MCF-7 breast cancer cells are used to study involvement of calpain. SK-N-AS and NGP cell lines will be treated with different concentrations of Beta-Lapachone. As the concentration of Beta-Lapachone increases, so does the number (percentage) of apoptotic cells. The findings may be useful as a foundation for developing future experimental designs for the mechanism of Beta-Lapachone as a chemopreventive agent.

ARE YOU AN EXPERT? THE ROLE EXPERTS PLAYED IN THE HISTORY OF THE INTERNATIONAL MONETARY FUND

Erika Lopez, and Clark Miller (Mentor),
LaFollette School of Public Affairs

Expertise and knowledge has allowed experts in different disciplines to successfully establish various Intergovernmental Institutions. One of them is the International Monetary Fund, and as part of an ongoing project which seeks to analyze the role experts played in the creation of these institutions I have made the IMF my area of concentration. Focusing on the history of the IMF it can be concluded that experts' knowledge was the ground of its creation, which makes the IMF a knowledge-based institution. Although involvement of non-experts was important, their participation seemed to have complicated the finalization of the IMF. The results of this project will shed light on the origin and functioning of these knowledge-based institutions; why did these institutions arise as opposed to power-based institutions?

ARTIFICIAL TRANSCRIPTION FACTORS: SERUM RESPONSE FACTOR

Theo Sanford, and Aseem Ansari (Mentor), Biochemistry

Many cells have identical information, yet only a subset of that information can be expressed in each cell. As a result, regulated expression of specific genes, instruct cells to adopt defined fates in an organism. Such expressions of genes can give rise to diseases such as cancer and diabetes. Artificial transcription factors can be designed to regulate a specific gene of interest. These regulators could potentially develop into a new class of 'transcription-based' therapeutics. Specifically, I research Serum Response factors; this phosphoprotein regulates skeletal and cardiac -actin gene transcription. Currently, I am purifying the phosphoprotein by using affinity chromatography. Preliminary results indicate that serum response factor could be an excellent model of artificial transcription factors.

BANANAS IS MY BUSINESS

Courtney Cottrell, and Kathryn Sanchez (Mentor),
Spanish and Portuguese Women's Studies Program

Carmen Miranda, the Brazilian singer/actress, has had a huge impact on American culture. She can be seen on bananas, in movies, on the radio, and her trade mark clothes have made a huge impact on fashion. The goals of this project are to understand the representation of Brazil and Carmen Miranda in the United States. My tasks are to review Newsweek articles (years 1939–1955) that mention Carmen Miranda, Brazil, or the Good Neighbor Policy. Other tasks are to search eBay for any memorabilia of Carmen Miranda and research what sort of memorabilia was popular in the 1940s. The end results of all this research will be published in a book and used for Latin American studies, Cultural studies and film/performing audiences.

BELIEFS ABOUT DIABETES IN UGANDAN ADULTS WITH TYPE II DIABETES

Maggie Steingraber, and Linda Baumann (Mentor), Nursing

Different cultural contexts influence what people believe and do in response to an illness. The purpose of this study is to describe beliefs and self-care behaviors in Ugandan adults who have type 2 diabetes. Data will be collected by interviewing 300 adult patients about their beliefs, self-care behaviors that include exercise/physical activity, eating, medication, blood sugar monitoring, risk factor reduction, problem solving for high/low blood sugars, and living with diabetes; and measuring height, weight, and waist/hip circumference. Participants will be recruited from the Kampala Diabetes Center (KADIAC) located in Mulago Hospital in Kampala, Uganda. Information from this study will be used to develop health education and culturally responsive interventions for the prevention and management of diabetes in Uganda.

BIOCORE PEER MENTORING IMPROVES STUDENT ACCLIMATION AND PERFORMANCE WHILE ENCOURAGING GROUP STUDY

Eric Kaiser, and Janet Batzli (Mentor),
Interdisciplinary Instruction Program - Natural Science

Biocore 301 is the first semester course of the four-semester Biology Core Curriculum. In an effort to assist students adjusting to the new learning environment, we initiated a peer-mentoring program with the goal of increasing student performance, reducing course-related stress, improving study habits, and encouraging the formation of autonomous study groups. Peer mentors are previous Biocore 301 students who facilitate small study groups each week for 2 hours. We present data analyzing achievement for students who participated in a peer mentor group compared to non-participants. Initial analysis suggests regular attendance in study groups correlates with higher student performance with students in the lowest entering GPA quartile making the greatest advancements. Further analysis will allow us to establish concrete benefits to peer-mentoring, and identify best practices.

BOMIMETIC GROWTH OF CRYSTALS: INCORPORATION OF CA AND MG IN THE CARBONATE

Son Sona, and Huifang Xu (Mentor), Geology and Geophysics

Nature produces extraordinary shapes of crystals that completely different from inorganic form of same compound. Scientist are try to find mechanism behind growth of crystal in nature which is process called biomimetic growth of crystal. Mg and Ca give an example of role of organic compound in the nature. Incorporation of Ca and Mg in the carbonate requires high temperature at least 700 Celsius in inorganic environment, but room temperature in organic environment by lowering its activation barriers. By using transition metal and organic matters, incorporation of Ca and Mg in the carbonate can be controlled and obtained in room temperature.

CANCER PATIENT'S PERCEPTIONS OF PAIN RELIEF WITH GUIDED IMAGERY AND PROGRESSIVE MUSCLE RELAXATION

Hannah Hau, and Kristine Kwekkeboom, PhD RN (Mentor),
Academic and Student Services

Cancer pain management is a challenge for patients and healthcare providers alike. Practice guidelines recommend using adjuvant nondrug interventions, however, current research indicates individual differences in their effectiveness. These findings may be related to how individual patients perceive specific nondrug treatments. Twenty hospitalized patients with cancer-related pain participated in a study of two nondrug interventions, guided imagery and progressive muscle relaxation (PMR). Pain intensity and pain-related distress were measured before and after each intervention. Subjects were then interviewed to ascertain their perceptions regarding (1) whether or not either treatment improved their pain experience, and (2) why the treatments did or did not work for them. Findings will be presented with respect to observed pain outcomes and patient's perceptions of effectiveness of guided imagery and PMR.

CARDIOVASCULAR DISEASE RISK AS IT RELATES TO DEPRESSION AND COPING IN DANE COUNTY AFRICAN AMERICANS

Kevin Bjork, and L.D. Oakley (Mentor), Nursing

In previous research, psychological factors including depression symptoms were found to have an effect on cardiovascular health. We plan to find out if this phenomenon is shown in African Americans in Dane County. To collect data, we plan to hold five sessions at a clinic in Madison. A depression questionnaire will ask about symptoms and positive/negative coping strategies. We will measure cardiovascular disease risk with a questionnaire on lifestyle and exercise habits, blood tests for A1C and cholesterol levels, height, weight, pulse and blood pressure. We expect that there will be a correlation between depression and cardiovascular risk. By participating in this project, we learned that there is a real connection between the body and the mind.

CARMEN MIRANDA

Annika Konrad, and Kathryn Sanchez (Mentor), Spanish and Portugese

The objective of this study is to determine if a relationship exists between the success of Brazilian pop star Carmen Miranda and the politics of the 1940's. The research involves studying issues of Time magazine dating from 1939 to 1945. There are three key topics on which the study is focused: Carmen Miranda, Brazil, other female Latin American musicians, and any other issues related to U.S. foreign policy in Latin America. While investigating these sources, a significant increase in coverage of Latin American politics becomes apparent. Little coverage of Carmen Miranda or other female Latin American artists is evident. By looking at Carmen Miranda in relation to US and Latin American politics, we become aware of the struggle Latin America has experienced in entering world politics.

CAUSES OF EDUCATIONAL INEQUALITIES

Whitney Antone, and Daniel Long (Mentor), Sociology

The purpose of our research is to show the causes of inequalities in educational attainment for groups with various ethnic backgrounds. There are inequalities in higher education among minority groups, and it is important to know what the causes are so attainment can be more equalized. We are currently working on descriptive statistics and regression analysis using questionnaires to find correlations between different variables. We are then using these correlations to support theories proposed in the book *The Source of the River*. We have not been able to make any conclusions yet, but we intend to shortly, as we finish our analysis.

CHARACTERIZATION OF MIR-427 AND ITS ROLE IN XENOPUS LAEVIS GENE REGULATION

Ryan Wagner, and James Dahlberg (Mentor), Biomolecular Chemistry

MicroRNAs (miRNAs) are a class of short (~22-nt) noncoding RNA molecules that down-regulate expression of their mRNA targets. Though their existence has only very recently been discovered, hundreds of miRNAs have been identified in a variety of multicellular, eukaryotic species such as *Xenopus* (*tropicalis* and *laevis*), *C. elegans*, *Drosophila melanogaster*, and *Homo sapiens*. It has become clear that miRNAs have emerged as regulators of gene expression. Despite their significance, miRNA, and in particular, miR-427 gene targets, are unknown at this point. Microinjection of plasmid constructs into *X. laevis* embryos has allowed for the determination of miR-427 gene expression levels at certain stages of embryonic development. Quantification of these levels was achieved through Renilla luciferase assays and has presently shown that miR-427 effectively represses gene expression in *X. laevis*.

CHEMOSELECTIVE REDUCTION OF LACTIMIDOMYCIN VIA STRYKER'S REAGENT

Yeng Her, and Ben Shen (Mentor), Pharmaceutical Sciences

In this research, more SAR information was needed on the inhibition of cell proliferation brought by lactimidomycin. The problem with lactimidomycin is that it undergoes rapid water-mediated rearrangement, which only provides a half-hour window to get the biochemistry done with the material. For this reason, this research is intended to test the hypothesis proposed by Dr. Shridhar Bhat as an attempt to solve the stability problem of lactimidomycin. Dr. Bhat hypothesized that the Stryker's reagent would reduce the lactone group of lactimidomycin without affecting other parts of the lactimidomycin chemical structure. As a result of the chemoselective reduction of lactimidomycin, the reduced product would be stable and SAR could be obtained.

CHILDREN'S MATHEMATICAL UNDERSTANDING IN RELATION TO THEIR OUT-OF-SCHOOL "CURRICULUM"

Taya Schairer, and Edd Taylor (Mentor), Curriculum and Instruction

The goal of the research is to determine children's rational number understanding developed through out-of-school practices. A component that will be studied is shopping practices in both mock stores and local liquor stores to determine how children's money interactions relate to mathematical competencies. The successes and strategies used to solve purchasing scenarios during mock stores were recorded. Also recorded were how children learned these skills (parents, self, etc.) and what kinds of practices they were previously engaged in that involved money (e.g. ice cream truck, allowance, etc.). To analyze the results, patterns in out of school practices will be looked at, which will give insight into how experience relates to children's success or failure in performing rational and money calculations.

CHILDREN'S EMOTIONS IN AUTISM

Rachael Bergquist, and Julia Wilbarger (Mentor),
Kinesiology, Occupational Therapy Program

The Affective Processes in Autism study will investigate how children with autism spectrum disorders (ASD), respond to social and emotional information using different measurements. The current study will compare the response of a small group of children with ASD to children matched for gender, verbal intelligence, and age using startle modification. Participants will view a series of pictures that vary on emotional content. During some of the pictures, they will hear a moderately loud (90db) tone that causes an eye blink startle. During these tasks, physiological measures will be taken, such as facial electromyography (EMG), electrodermal response (EDR), and heart rate (HR). Typical individuals will have a greater startle response when viewing negative images compared to viewing positive images. We hypothesize that the ASD group will demonstrate increased physiological arousal and aversive responses to both positive and negative affective stimuli compared to typical groups.

CHILDREN'S USE OF INDUCTIVE REASONING IN MATHEMATICAL CONTEXTS

Sarah Sanchez, and Chuck Kalish (Mentor), Educational Psychology

Children's primary way of collecting information is through inductive inferences, making generalizations based on past experiences. However, in the study of math, children are encouraged to go against their natural tendency and are instead taught to methods of deductive reasoning. Using already proven components of category-based induction (CBI), we designed an experiment connecting math concepts to elements of CBI such as generalizations, number of examples, etc. Our goal is to determine if children will transfer induction skills into the mathematics domain. Our method involves developing a mathematical program which determines how children's use of CBI varies from adults'. We hope to gain new insight into a more effective method of teaching children math and improving comprehension and retention rates.

CLONING OF GLI1 INTO PTRE-TIGHT FOR THE STUDY OF ITS POST-TRANSCRIPTIONAL REGULATION

David Pierce, and Vladimir Spiegelman (Mentor), Dermatology

Gli1 is a key component of the Hedgehog signaling pathway, involved in the development of many human cancers. We have sub-cloned the full length Gli1 cDNA into the pTRE-Tight vector, downstream of the Tet-inducible promoter, to study the post-transcriptional regulation of Gli1 expression. We amplified Gli1 cDNA from pOTB7 by the polymerase chain reaction (PCR) using specific primers. The pTRE-Tight vector was linearized with the restriction enzyme SmaI and ligated with our PCR product. DH5-alpha competent cells were transformed with the ligated product. Positive clones were verified by PCR, restriction digestion using KpnI restriction enzyme, and by sequencing using appropriate primers. These clones will be used to study the post-transcriptional regulation of Gli1 expression.

COMPLEXITY OF OFFSHORE FLOW IN THE PACIFIC NORTHWEST DURING SUMMER

Emily Niebuhr, and Matthew Hitchman (Mentor), AOS

Weather in the Pacific Northwest during summer is usually dominated by a high pressure system in the Northeast Pacific that typically brings mild and dry weather to the Pacific Northwest and northerly flow. However, the interaction of synoptic events with the coastal mountains and the diurnal cycle of land heating and cooling on the Olympic, Cascade and Vancouver Island mountains can contribute to the formation of disturbances in this fair weather pattern and different wind patterns. Few studies have focused on the case of flow patterns resulting from large-scale offshore flow in this region during the summer. The University of Wisconsin Nonhydrostatic Modelling System (UWNMS) was used to examine a case study of the formation of vortices that occurred as a result of offshore flow on August 14–15 2002. In this presentation, the complex factors that contribute to the formation of mesoscale vortices off of the Washington coast will be explored.

CULTURAL AND SOCIETAL FACTORS CAUSING HIGH RATES OF CERVICAL CANCER AMONG VIETNAMESE WOMEN

Jonathan Truong, and Michitake Aso (Mentor), History of Science

Cervical Cancer, a detrimental disease affecting many women today, is five times greater among Vietnamese American Women than Caucasian Women. Many V.A. Women today may have lower socioeconomic status and cultural stigmas (e.g. reproduction), which could be the cause of the high occurrence of cervical cancer among V.A. The purpose of this research is to conduct a survey for V.A. Women in the Madison community that would ask of socioeconomic status, cultural stigmas, and one's prevalence and knowledge of cervical cancer. With this information, socioeconomic status and cultural stigmas could be compared with other similar studies. This data could direct more studies toward cultural practices of V.A. Women. And concurrently, draw science closer into fully understanding this health disparity.

**CYPRUS: EFFECTS OF BICOMMUNAL YOUTH
ACTIVITIES ON EMPOWERMENT IN THE
ETHNICALLY DIVIDED ISLAND**

Tamara Shapiro, and Mary Layoun (Mentor), Comparative Literature

Using a framework of psychological and organizational empowerment, processes that led to individual and group empowerment were investigated in two bicommunal youth organizations and three bicommunal youth summer camps on the ethnically divided island of Cyprus. The research showed that youth who organized bicommunal activities prior to a referendum on a proposed solution to the prolonged conflict had become disempowered after the referendum failed to pass in both the Turkish Cypriot and Greek Cypriot communities. However, an emerging movement of bicommunal activities centered around shared social concerns is possibly reinvigorating bicommunal activities and youth empowerment on the island.

**CYTOKINESIS IN CAENORHABDITIS ELEGANS;
SEARCHING FOR A KINASE REDUNDANT TO RHO-
DEPENDENT KINASE**

Andrew Thornton, and Ellen Batchelder (Mentor), Anatomy

Rho-Dependent kinase (ROCK) is a protein kinase that, in many organisms, mediates cytokinesis. When ROCK is inactivated in *C. elegans* embryos, cytokinesis fails only occasionally, suggesting that other kinases may also be involved. We have designed an experiment to screen all proteins with kinase domains from the *C. elegans* genome for kinases that act redundantly with ROCK. Each kinase is being depleted by RNA-mediated interference in a worm strain, WH218, where ROCK is inactive. Kinases that are redundant with ROCK will be apparent because they will increase cytokinesis defects, and thus embryo lethality, compared to embryos with inactive ROCK alone. Results of this experiment have implications for science and healthcare, as many cancers result from cells that are defective in cytokinesis.

DANCING THROUGH LIFE: A GEOMETRIC ANALYSIS OF BIOLOGICAL MOVEMENT AND DYNAMIC GENE EXPRESSION

Laura LeGault, and Amir Assadi (Mentor), Mathematics

Perception of biological motion has long been studied in psychology - humans can identify the activity and identity of moving objects from a few reference points. Similarly, from a crowd of reference points, one can determine which points describe an individual. With the assistance of the Dance Department, utilizing motion capture technology, I will investigate the mathematical implications of this phenomenon, discover an analytic description of curves traced by human perambulation, and develop an algorithm (and computational implementation) to recognize patterns of motion in a group of points and classify the data into coherent subgroups. I hope to generalize the underlying mathematics to model dynamics in complex systems, such as patterns of dynamics in gene expression, and discover constraints on the architecture of gene networks.

DEEP ECOLOGY

Bradley Strock, and Kurt Squire (Mentor), Curriculum and Instruction

The project “Deep Ecology” is completely on the production side of research. We are creating a tool via an interactive world that will allow users to not only learn different data about a “mock” sea world, but also to learn different techniques in the world of research itself. I, along with a well-versed team, am creating the virtual world of “Deep Ecology” and although we are nowhere near completion, considerable progress has been made. I have focused on the aspect of AI, or Artificial Intelligence, to create a realistic ecosystem that the user will be able to interact with. Working with Professor Squire, we will also examine users’ experience of “Deep Ecology” as a simulated ecological system, and begin to measure how they perceive the space as a realistic, authentic, and intriguing study. The goal of all of this is to supply a medium for classrooms to not only enhance and invigorate education, but also to make it fun.

DETERMINING GENES OF INTEREST WITH ROLES IN BONE STRENGTH THROUGH A RECOMBINANT INBRED MOUSE SYSTEM.

Samuel Cornale, and Robert Blank (Mentor), Endocrinology

After age 25, the human body loses the ability to increase bone mass. With an aging baby boomer population and a continuously climbing life expectancy, bone deterioration is a growing problem. Sharing 99% of our genome (Rogers 2002), mice have proven to be a useful scientific model in the research of this field. Crossing strains of recombinant congenic mice having identical parents decreases the number of segregating loci, thus allowing more statistical power in finding genes of specific interest with potential roles in bone integrity and strength.

DETERMINING LOCALIZATION DOMAINS IN CAR-1; A PROTEIN ESSENTIAL FOR CYTOKINESIS.

Donnie Beers, and Jayne Squirrel (Mentor), Molecular Biology

CAR-1 is a protein essential for completion of cytokinesis in nematodes. The goal of this study is to determine the role of the domains of this protein as they pertain to localization and function. The study involves the use of DNA constructs consisting of portions of CAR-1 tagged with GFP. These constructs are then expressed in worm embryos that can be imaged live. I expect that different pieces of CAR-1 will result in differential GFP localization. Those that do not localize properly will indicate which domains are vital for localization. This study will ultimately increase our understanding of CAR-1 and its role in Cytokinesis.

DEVELOPING RESTORATION GUIDELINES FOR THE HOWARD TEMIN LAKESHORE PATH SHORELINE

Zachary Hirschtritt, and Rebecca Kagle (Mentor), Land Resources

This research project is focused on creating a set of restoration procedures for the historic private boat launches along Howard Temin Lakeshore Path, located on the UW Madison campus. The goal is to create individual restoration plans for approximately six sites of heavy human use and erosion. In addition, I will have hopefully completed the restoration and a detailed maintenance protocol for at least one of these sites. Creating such a protocol requires my study of the area's local limnology and vegetation, as well as architectural techniques designed to prevent soil erosion. This project represents a piece of a much larger plan to restore all of our campus's natural areas - an effort to keep our campus ecologically healthy and aesthetically beautiful.

DEVELOPMENT OF GDNF SECRETING HUMAN NEURAL STEM CELLS FOR THE TREATMENT OF PARKINSON'S DISEASE

Andrew Haertel, Stacy Loerch, and Marina Emborg (Mentor), Anatomy

“Development of GDNF secreting human neural stem cells for the treatment of Parkinson's disease” Stacy Loerch and Marina E. Emborg (Mentor) Primate Research Center Past experiments have shown that glial cell line-derived neurotrophic factor (GDNF) can stop degeneration, protect and sustain dopaminergic cells in Parkinson models. We are testing the delivery of GDNF using human neural progenitor stem cells. In this experiment human neural stem cells genetically modified to produce GDNF are injected into the striatum and substantia nigra of Cynomologous monkeys that have experimentally induced parkinsonism. This study will provide results regarding the effectiveness of this delivery method as well as potential complications. The monkeys are currently being trained to perform various behavioral tasks in preparation for baseline measurements. Our future results may be helpful in treating patients with Parkinson's

DO DIFFERENCES IN TEMPORAL PROCESSING DIFFER WITH LANGUAGE ABILITIES IN CHILDREN WITH SLI?

Stephanie Pesa, and Ruth Litovsky (Mentor),
Communicative Disorders, Psychology

A significant number of children have Specific Language Impairment (SLI), whereby language abilities are delayed compared with typically developing (TD) children, possibly due to temporal processing. Little is known about whether speed of processing delay is generalized to non-language measures. In this study, a robust measure of auditory processing was used. Children's ability to discriminate between source-echo locations was measured as a function of temporal delay (milliseconds). This ability is known to follow a robust developmental trajectory between birth and 10 years of age in TD children. Results will compare temporal thresholds for children with SLI and TD children. The anticipated outcome is that thresholds will be greater (slower processing) in the SLI group, suggesting the role of generalized temporal auditory processing mechanisms in SLI.

EFFECT OF CYTOKININS ON THE SYMBIOTIC AND NON-SYMBIOTIC ROOT DEVELOPMENT OF MEDICAGO TRUNCATULA

Jennifer Homer, and Geraldine Loughon (Mentor), Agronomy

The establishment of a nitrogen-fixing symbiosis between rhizobia and the model legume *Medicago truncatula* involves modifications in hormone balance that lead to nodule organogenesis. Our goal is to determine if the symbiotic gene *DMI2* plays a role in the cytokinin homeostasis. BAP (Benzylaminopurine, a cytokinin hormone) was added exogenously to wild-type plants and to two *dmi2* mutants (R38 and TR25) in presence or not of symbiotic bacteria. Primary and lateral root lengths were measured daily for 10 days. The number of lateral roots was also recorded to provide a more precise description of the root architecture. This work should allow us understanding better how *DMI2* plays a role in these developmental processes. This knowledge should participate in making farming practices more efficient and environmentally friendly.

EFFECT OF DIETARY SELENIUM ON GROWTH AND SELENOENZYME ACTIVITY IN WILD TYPE AND GPX1 KNOCKOUT MICE

Jessica Sapiro, and Roger A Sunde (Mentor), Nutritional Sciences

A mouse study was conducted in male wild type (WT) and Glutathione Peroxidase-1 (GPX1) knockout (KO) mice to better understand the slower growth rates of KO mice in previous studies. Growth and GPX1 and GPX4 activity levels in liver, kidney, and testis were determined. Twenty-one day old mice were fed either -Se or +Se (0.2 μ g Se/g diet) diets. In both treatment groups, GPX1 KO mice grew slower than WT mice. As expected, GPX1 activity was virtually absent in liver and kidney of KO mice, but activity in testis remained 50% of WT levels. GPX4 activity was not significantly affected by dietary Se or genotype in these tissues. These results suggest that current genetics is the cause of the slower growth in GPX1 KO mice.

EFFECT OF EGF ON THE EXPRESSION AND ACTIVITY OF LIGAND-BINDING IN MAMMALIAN CELLS

Jason Jacoby, and Paul Bertics (Mentor), Biomolecular Chemistry

Epidermal growth factor receptors (EGFRs) are membrane bound proteins that lead to cell activation following hormone (EGF) treatment, and are commonly involved in multiple cancers. In cancer cells, EGFR over-activation can lead to uncontrolled replication. Experiments were designed to determine if, after activation, EGFRs in mammalian cells become internalized and degrade, and if EGFR-induced cellular activation decreases over time. In these studies, mammalian cells were treated with EGF and analyzed for receptor expression and activation using various electrophoretic and immunological techniques. Results indicated the responsiveness of the EGFR was initiated within minutes and continued to increase over a two hour period, contradicting current literature. To support these findings, additional immunodetection experiments will be conducted. Understanding EGFR turnover and associated intracellular signals in cancer cells could open doors for new therapeutics.

EFFECTIVENESS OF NO CHILD LEFT BEHIND

Alula Eshete, and Daniel Long (Mentor), Sociology

This research examines the controversial NCLB Act, passed in 2001 aiming to minimize the achievement gap in schools nationwide. NCLB's goal is to raise the achievement level of less prestigious schools by giving students annual tests and tracking the scores. NCLB also entitles the government to step in and replace faculty, principals and even take control over the school if they are not meeting the guidelines. This topic is of such interest to me because the effectiveness of NCLB is questionable. This research entailed comparing Nationally Assessment of Educational Progress (NAEP) scores that have been around for over 30 years, to those recorded by the states, then measuring the discrepancies. These statistics allow us to draw a conclusion on whether or not NCLB is effective.

EFFECTS OF CHRONIC ARSENIC EXPOSURE ON NOTHERN LEOPARD FROG (RANA PIPIENS) TADPOLES

Michelle Tamez, and Te-Hao Chen (Mentor), Wildlife Ecology

We conducted a preliminary study on the effects of chronic arsenic exposure to *Rana pipiens* tadpoles, and found unexpected results, e.g., that animals in the low dose group (20ug/L) experienced significantly higher mortality during both tadpole and tail resorption periods than in all other treatments including the high dose (500ug/L). The U-shaped dose-response indicates that tadpoles exposed to low doses of arsenic may be more vulnerable than those exposed to higher concentrations. This study aims to provide further information regarding the effects of environmentally relevant levels of arsenic on survival, growth, development, swimming performance, and metamorphosis of *R. pipiens* tadpoles. We also seek to test whether the current Environmental Protection Agency (EPA) freshwater-quality chronic arsenic criterion, set at 150 ug/L, is adequate to protect this species.

EFFECTS OF CYTOKINES ON ECM GENE EXPRESSION VIA IN VIVO & IN VITRO MODELS OF RAT VOCAL FOLD CELLS

Ayesha Hasan, and Nathan Welham (Mentor), Surgery

Vocal fold scarring is one of the greatest causes of poor voice quality. Scarring causes a disruption of the viscoelastic layered structure of the lamina propria and an increase in stiffness of the vibratory structure. Cytokine TGF-beta works to increase the production of structural proteins, like collagen and elastin. The absence of another cytokine, COX-2, has been found to produce scar-less healing, while its presence leads to scarring. In vivo models will confirm the prevalence of these cytokines after vocal fold injury, as well as their stipulated effects on the ECM. In vitro studies will then try to replicate these results. This model can then be used to determine the effectiveness of treatments like HGF or other novel therapies on vocal fold fibroblast inflammation.

EFFECTS OF GALLING ON GOLDENROD REPRODUCTION

Alexander Heeren, and Michelle Harris (Mentor), Biocore

We are investigating the effects of the parasitic fly *E. Solidiginis* on goldenrod reproduction. The eggs of *E. Solidiginis* are laid on goldenrod in summer. The larvae hatch, then burrow into the stem. Larvae induce the plant to produce a protective structure, a gall, where larvae remain until maturation. Gall formation usurps plant resources, but it is unclear if this affects the plant's reproductive success. We hypothesize that infected goldenrods will produce seeds with lower germination success and slower growing seedlings compared to unaffected plants. To test this hypothesis we are measuring germination of seeds collected from galled and ungalled goldenrods during fall 2005. We will measure these growth rates and compare them with other forms of goldenrod growth.

EFFECTS OF HOST DIVERSITY ON SCHISTOSOMA MANSONI TRANSMISSION

Peder Lund, and Pieter Johnson (Mentor), Zoology

Host diversity has been hypothesized to affect the epidemiology of parasitic infections. This phenomenon, known as the “dilution effect,” occurs when ill-suited hosts divert parasites away from their most viable hosts, thereby reducing infection rates. Our study investigates the effect of snail diversity on infection rates of the trematode *S. mansoni* on their preferred snail host *Biomphalaria glabrata*. Snail hosts (*B. glabrata*) will be exposed to *S. mansoni* miracidia in the presence of none, one, or two additional snail species. Because *S. mansoni* is pathogenic to humans, the results of our study could have implications in the control of schistosomiasis, a disease afflicting 200 million people globally.

EFFECTS OF PASTEURIZATION ON BIOLOGICALLY- ACTIVE FACTORS IN HUMAN MILK

Christa Pittner, and Pamela Kling (Mentor), Pediatrics

Human milk contains biologically-active factors important in the development of premature infants, but also transmits infectious pathogens. Heat pasteurization kills pathogens and limited information suggests no major structural breakdown of biologically-active factors, but it is unknown whether limited breakdown removes biologic effects. We hypothesized that milk would retain its biologic effects following pasteurization. To test this hypothesis two measures of cell growth were performed on an in vitro fetal gastrointestinal cell model, after incubation at 37°C for 24 hours. Cell proliferation and protein concentrations were measured with mitochondrial activity (MTT) and protein (BCA) assays. We anticipate little difference in growth between cells treated with pasteurized and unpasteurized samples. If our hypothesis is supported pasteurized milk banks will provide premature infants with an optimal food source.

ELASTIN-LIKE POLYPEPTIDE FUSION PROTEINS FOR PURIFICATION AND THERMAL THERAPEUTIC DELIVERY

Cale Fahrenholtz, and Darin Furgeson (Mentor), Pharmaceutical Sciences

Elastin-like polypeptides (ELPs) consist of pentapeptide repeats (Val-Pro-Gly-Xxx-Gly), where Xxx may be any amino acid other than proline. ELPs reversibly transition about an inverse transition temperature (T_t). At temperatures below T_t ($T < T_t$), the ELP hydrophobically collapses into an insoluble aggregate. We may exploit this phase transitive behavior for the purification of proteins by constructing ELP fusion proteins for expression in *E. coli* systems. Following expression of the ELP fusion protein, this thermo-transitive behavior may be exploited as an efficient means of purification as the protein can be easily separated from the ELP. Also, this phase transition behavior is useful for systemic and local drug delivery, wherein an external hyperthermic source at a $T > T_t$ will localize the ELP therapeutic or ELP fusion protein near the tumor site.

EMERGING LATINO ORGANIZATIONS IN MADISON

Alma Ruiz, Vanessa Sanchez, and Sherrill Sellers (Mentor), Social Work

The “Emerging Latino Organizations” research project explores emerging Latino organizations in the city of Madison. The Latino community in Madison is relatively new and growing. Along with this growth comes the birth of many developing Latino organizations. Although there are various types of Latino organizations, this research includes restaurants, grocery stores, and social services. These specific organizations were selected under selective criteria. The organizations are native to Madison, of Latino origin, and not part of a franchise. Through interviewing these organizations we saw how they went from being informal to formal organizations, the challenges they confronted, and their future expectations. It is important that we explore these organizations as they serve the largest, and one of the fastest growing, ethnic populations in the US.

EMOTIONAL CONTAGION AND TRAINING OUTCOMES

Darin Chokdee, and Stefanie Halverson (Mentor),
Management and Human Resources

The understanding and importance of social involvement in our community originates from our interactions with other people through our emotions. The goal of this research is to examine the effects of trainer emotions on trainee outcomes. This experiment was conducted using an actor displaying positive and negative emotions on video-tape. The training video was shown to a group of students informing them about conflict management. After viewing the tape, the students completed questionnaires and a learning test. It was hypothesized that students would catch their trainer's emotions through emotional contagion, such that trainees in the positive affect condition would experience positive affect and trainees in the negative affect condition would experience negative affect. Trainees in the positive affect condition were also expected to rate their trainer higher, report greater levels of motivation and self-efficacy, and perform better than trainees in the negative affect condition.

EPICS SERVICE-LEARNING COURSE: PROJECTS WITH REAL-WORLD NON-PROFITS

Emily Stern, and Fred Bradley (Mentor), MS & E

The objective of ePICS is to allow students to work on a professional level with a non-profit organization. To implement this project, students were placed on teams typically consisting of eight members. A project charter was created such that the client and team were clear on what deliverables that were to be expected at the end of the semester. Independent Living's project team created a new website for the organization, created new flyers for marketing, created a volunteer and marketing directory, added an online volunteer application, and completed two volunteer projects with the organization. The ePICS course truly gives students the opportunity to learn outside the box. ePICS allows students to take on leadership roles unlike any roles in the typical classroom.

EVALUATION OF ANTIOXIDANT LEVELS IN CRITICALLY ILL DOGS AND CATS

Beth VanderWielen, and Lauren Trepanier (Mentor), Medical Science

Antioxidants scavenge free radicals that damage the cell membrane, nucleic acids, and proteins, leading to cell dysfunction, carcinogenic mutation or cell death. Antioxidant deficiency in ill human patients has been established; however, similar data is not known for ill small animals. Therefore, our project aims to evaluate the levels of antioxidants, specifically ascorbic acid (AA) and cysteine (CYS) in plasma, and glutathione (GSH) in red blood cells, in healthy and sick dogs and cats. Our aim is to determine whether there is a correlation between disease type, stage of progression, and these specific antioxidant levels. AA, CYS, and GSH levels are measured utilizing High Performance Liquid Chromatography. This research will provide valuable information to determine whether antioxidant supplementation will improve the outcome of veterinary hospitalization.

EXPECTATIONS OF HOW DIABETES WILL BE DIFFERENT IN PATIENTS WITH POST KIDNEY TRANSPLANTATION

Karina Christensen, and Linda Baumann (Mentor), Nursing

The purpose of this project is to investigate expectations of patients with a kidney transplant about how having diabetes is different post-transplant. Diabetes is the number one cause of chronic kidney (or renal) failure in the U.S. and kidney disease among people with diabetes has more than doubled in the past decade. I plan to interview 10 patients from the UW Hospital Transplant Unit after kidney transplantation who have diabetes. The interview focuses on asking open-ended questions about coping mechanisms and self-care behaviors before and after kidney transplantation. The data will be coded using content analysis. Results will provide information to healthcare providers on coping processes used in patients with kidney transplant and diabetes.

EXPLORING COMMUNITY AND FUNDAMENTALISM: RHETORIC AND INDIAN AMERICAN POLITICAL PERFORMANCE

Mona Mogahed, and Christine Garlough (Mentor), Communication Arts

This project rhetorically analyzes a political performance piece entitled “Rise”, written and enacted by Indian American artist Shyamala Moorthy. In “Rise” Moorthy critically reflects upon two historical moments: (1) the Hindu-Muslim communal violence in India, particularly the 2002 Gujarati riots resulting in the deaths of over 2,000 Muslims and (2) the patriotic fundamentalism, stereotyping, and hate crimes in the United States following the September 11th attacks. Moorthy’s piece considers the damaging social effects of religious and political fundamentalism and asks how one might conceive of difference without opposition. We find the eclectic style suggests a dynamic way of being and belonging that maintains a sense of community and yet does not imply uniformity or timelessness; thereby it interrupts the fiction of a unified Indian subject.

EXPLORING THE BOUNDARIES BETWEEN DIGITAL AND NON-DIGITAL ART

Nhialee Yang, and Mark Nelson (Mentor),
Environment Textile and Design

This project explores the boundaries between digital art and non-digital art through the printing process. By printing a large scale canvas, people perceive the digital image as a traditional painting. In order to produce such an effect on people’s perception, the printing process plays a crucial role in this. For example, deciding the print media to use, such as canvas or photo-paper, affects the quality and feel of the print finish. While canvas absorbs more colors producing a duller look, it gives the image a certain degree of realism; as compared to a highly saturated and bright image that photo-paper produces. Within the printing process, I work with print media and color settings, looking for the best combinations of material to produce an image of desired effect.

FAILURE RATES OF PROJECTILE POINTS DURING EARLY STAGES OF MANUFACTURE AND ITS RELEVENCE TO FLUTING

Patrick Schmitt, and Jonathan Kenoyer (Mentor), Anthropology

The fluted projectile point burst onto the North American scene circa 12,000 years ago with the famous Clovis culture and virtually disappeared after the Folsom period circa 10,000 years ago. The purpose of fluting points remains a mystery, as no functional benefits over non-fluted points are known. Experimental archaeology has shown the difficulty in fluting a projectile point. Combining the high failure rates associated with fluting and those from early-stage manufacture results in very high failure rates and, therefore, production costs, and perhaps played a role in the flute's disappearance. This project examines failure rates, especially those due to end thinning, and production costs of early-stage manufacturing to assess overall failure rates and production costs of the entire production process of a fluted projectile point.

FETAL ANDROGEN EXCESS EXAGGERATES LUTEINIZING HORMONE RELEASE IN POLYCYSTIC OVARY SYNDROME MONKEYS

Sarah Hoffmann, and David Abbott (Mentor),
Department of Obstetrics and Gynecology

Excess androgen exposure to the developing female hypothalamus produces alterations to gonadotropin-releasing hormone (GnRH) release, which may cause excess luteinizing hormone (LH) secretion. Thus, LH hypersecretion found in polycystic ovary syndrome (PCOS) women may be a consequence of excess androgens in utero. To test this hypothesis, 7 adult females (3 exposed to androgens during early (EPA) gestation and 4 exposed to androgens during late (LPA) gestation) and 3 control females were studied. LH levels were determined from blood samples obtained through an indwelling catheter at 10-min intervals for 10 hours. Our findings demonstrate an increase in LH pulse frequency in EPA, but not LPA, females. The acceleration of LH pulse frequency in EPA females alone implies that early prenatal androgen exposure programs for accelerated GnRH pulsatility.

FRAMING THE STEM CELL DEBATE: RELIGION AS A MODERATING FACTOR

Muzammil Hussain, and Douglas McLeod (Mentor),
Journalism and Mass Communication

In Mass Communication, framing research posits that exposure to certain message frames, or ways of presenting an issue, may make certain cognitive schema more accessible, and thereby shape audience interpretations and evaluations. This experimental study looks at how participants' judgments and attitudes towards stem cell research were shaped when viewers were exposed to the stem cell controversy through the lens of an ethical frame or a strategic frame. This framing effect may be moderated by religiosity, which may influence audience susceptibility to the effects of ethical or strategic frames. Moreover, other related attitudes, such as opinions on abortion, may mediate these framing effects. Data for this study were generated by an online experiment conducted by UW's Mass Communications Research Center researchers, including the author.

FRESHMEN INTERVENTION SURVEY ON HEALTH HABITS (FISHH)

Joe Xaypharath, and Laura Saunders (Mentor),
Professional Development & Applied Studies; Family Studies

This project examines the efficiency of a peer-administered alcohol education, screening, and intervention program for college freshmen women of UW–Madison. We employ a peer-to-peer counseling strategy with upper class students for freshmen participants. Data is obtained through online and paper surveys. My responsibilities include administering the results, preparing a table, and listing students who exceeded drinking limits. They will be offered two sessions of telephone based counseling to reduce their drinking. We have completed the online survey, and organized the results in a data table, which will decide who requires extra assistance. I prepared letters that have been sent to the students with personal feedback. After their interventions session are completed, the students will be invited to complete a post-intervention online survey.

FUNCTIONAL NEUROANATOMY OF ANGIOTENSIN RECEPTOR SUBTYPES IN RAT BRAIN

Sarah Saeed, and Mark Brownfield (Mentor),
Department of Comparative Biosciences

Angiotensin II (ANG) is an octapeptide hormone and neurotransmitter that is important in fluid and electrolyte metabolism and cardiovascular homeostasis. In the rat, ANG acts on three different receptor subtypes (ATRs): AT1a, AT1b, and AT2. Microneuroanatomical studies of ANG distribution show that there are specific ANG neural circuits. It remains to be determined where ATRs reside. In this project we will complete microscopic immunocytochemical mapping of AT1a, AT1b and AT2 receptors and study levels of their expression. Preliminary results show that ATR's receptors are differentially distributed in ANG circuits. To determine relative levels of expression of the ATR's we subjected protein homogenates of regional rat brain areas to gel electrophoresis and immunoblot analysis. Results provide better understanding of ANG circuits and targets for drug development.

GENDER DIFFERENCES IN OUTCOMES OF INFECTION CAUSED BY RESISTANT BACTERIA

Anita Theama, and Nasia Safdar (Mentor), Infectious Disease

Research was conducted to determine if the outcome of infections by bacteria resistant to antibiotics such as methicillin-resistant *Staphylococcus aureus* (MRSA), vancomycin-resistant *Enterococcus* (VRE), *Clostridium difficile* (CD), and gram-negative bacteria differ according to gender. To verify if one gender is more susceptible to harsh outcomes from infection by the bacteria, medical articles were reviewed for the occurrence and length of hospitalization and mortality rate. Results indicated that majority of the articles reviewed found women are more likely to endure worse symptoms from infection. The goal of the research is that if there are gender differences affecting the outcomes from the bacteria, then medical professionals will be able to explore the reasons why there are gender differences and prevent infection.

GENDER DIFFERENCES IN PEER RELATIONSHIPS ACROSS THE TRANSITION TO MIDDLE SCHOOL

Brittney Olson, and Marilyn Essex (Mentor), Psychiatry

Three hundred seventy Wisconsin families with children were surveyed in grades 5 and 7. The initial objective was to determine if there were significant gender differences in behaviors toward peers, including asocial and prosocial behaviors, overt and relational aggression, and social inhibition. In both grades, there were significant gender differences in prosocial behavior, overt aggression, and social inhibition, but there were no significant differences in changes in these behaviors from 5th to 7th grade. The secondary objective was to determine if these behaviors toward peers influenced children's perceptions of peer acceptance. Overall, in both grades, negative behaviors toward peers were associated with less peer acceptance. And especially for males, increases in negative behaviors were associated with decreased peer acceptance from 5th to 7th grade.

GENERATION OF PULSED ULTRA-VIOLET AND MID-INFRARED SUPER-CONTINUA IN STANDARD SINGLE-MODE FIBER

Renata Bartula, and Scott Sanders (Mentor), Mechanical Engineering

Super-continua were generated in single-mode fibers in the ultraviolet and the mid-infrared, 337–405 nm and $\sim 1.5\text{--}3.4 \text{ }\mu\text{m}$, respectively. In the ultraviolet, pulses of 4 ns duration at 337 nm were coupled into a 50-m-long UV-grade fiber. Significant spectral broadening was achieved with pulses of only $\sim 10 \text{ W}$ peak power. Our experiments demonstrated the potential for a source with $\sim 10^4$ times the spectral radiance of a QTH lamp. In the mid-infrared, pulses from an erbium-doped fiber laser are coupled into a silica fiber and a fluoride fiber connected in series. By cascaded Raman soliton self-shifting, a continuum extending to a wavelength of $\sim 3 \text{ }\mu\text{m}$ was generated. At 2.9 μm , the spectral radiance was approximately 4600 times that of a 3000 K blackbody.

GLOBAL FRESHWATER FISH DIVERSITY AND THE DISTRIBUTION OF EXOTIC SPECIES

Asshley Swanson, Professor Julian D. Olden (Mentor), Natural Science

Introduction of exotic species of fish into native populations adversely affects the current ecosystems as the native populations must compete for resources and space in their natural habitat. This research focuses on categorizing known exotic freshwater species of fish and tracking which countries throughout the world donated and received the particular species. By tracking migration and movement patterns throughout the world, we hope to discover new ways to limit this widespread distribution. Using various fish databases and research papers, we have documented the movement of over 1200 species of fish, and are currently in the process of determining the causes of these movements while paying particular attention to pet trade, Gross National Product (GNP), and human-mediated invasions.

GLUCAGON-LIKE PEPTIDE 2 INDUCED FOS NEURONAL CIRCUITS IN RAT BRAIN

Cassie Delgado, Ashley Mellenthin, and Mark Brownfield (Mentor), Comparative Biosciences

The purpose of this research is to learn more about neuronal circuits employed by glucagon-like peptide 2 (GLP-2) to inhibit feeding. This peptide binds to its receptor to specifically activate neurons that then respond with neurotransmitter release to activate a neural circuit that would limit feeding. Rats are injected with GLP2, then ninety minutes later, anesthetized, perfused with histological fixative, and their hindbrains are removed, sectioned, and stained immunocytochemically for GLP2-induced nuclear fos protein (black color) and neurotransmitter (brown color). So far, we have seen positive results with the staining. We saw that the double staining for C-Fos and GLP2 show two areas of the brain, nucleus of the solitary tract and area postrema, that are known sites in the brain to deal with feeding.

HAIRY ROOT TRANSFORMATION SYSTEM IN MEDICAGO TRUNCATULA AND SOYBEAN

Katelyn Levene, and Jean-Michel Ane (Mentor), Agronomy

Transformation is the change in a cell or organism do to integration of new DNA. A popular transformation technique uses *Agrobacterium tumefaciens* bacteria to produce calli, unorganized tissue capable of regenerating an entire plant. A faster approach uses *A. rhizogenes* to produce transgenic, or “hairy,” roots opposed to regenerating an entire transgenic plant. My goal is to optimize “in vitro” and “ex-vitro” hairy root transformations for the introduction of various DNA constructs in *M. truncatula* and soybean. Constructs include GFP (Green Fluorescent Protein) fusions to localize proteins of interest within cells, and RNAi (RNA interference) to decrease the expression of genes for determining their biological role.

HEAVY METALS IN BLACK BEARS (URSUS AMERICANUS) AND RIVER OTTERS (LUTRA CANADENSIS) IN WISCONSIN

Lili Prah, and Jackson Gross (Mentor), Wildlife Ecology

Heavy metals are known to have adverse effects on the health of organisms when they exceed threshold concentrations in tissues. Black bears and river otters provide exceptionally good study organisms to assess the distribution of heavy metal pollution across a landscape. Bears, as omnivores, feed both on aquatic and terrestrial species while river otters exist at the interface between terrestrial and aquatic ecosystems and feed primarily on aquatic organisms. Both species have large home ranges and are long lived which, along with their varied diet, makes them good bio-indicators. In this study we have examined concentrations of various heavy metals in the blood and tissues of black bears and river otters generating a map of metal contamination across northern Wisconsin.

HELPING ONE'S FRIENDS: FRENCH POLICY IN RWANDA (1990–1994)

Neha Sheth, and Kathy Cramer Walsh (Mentor), Political Science

This study seeks to determine the reasons behind France's foreign policy toward Rwanda before and during the Rwandan genocide. During the Rwandan civil war and the genocide, France strongly supported the Rwandan government. My hypothesis is that French policy in Rwanda prior to the genocide was no different than French policy in the rest of Francophone Africa. France did not intentionally support a genocidal government; rather, its policy of blind support for its ally left it trapped in Rwanda. To evaluate French policy, I examine scholarly writings, the Assemble Nationale's inquiry on the genocide, and *Le Monde's* coverage of Rwanda. I conclude by discussing the broader implications of these findings for Western foreign policy, arguing that great powers must exercise caution when supporting foreign governments.

HELPING STUDENTS OVERCOME ACADEMIC CHALLENGES THROUGH IDENTIFYING THE OBSTACLES THEY FACE

Desiree Kroes, and Laura Fillingame (Mentor), Counseling Psychology

This program is attempting to examine the individual factors that may enable students who have been placed on academic probation to remove themselves from probationary status. UW students in the College of Letters and Sciences and in the College of Agriculture and Life Sciences who have been placed on academic probation are given a series of questionnaires designed to assess their general self-efficacy, academic self-efficacy, and implicit theories of academic probation. It is our hope that by better understanding how self-efficacy and implicit theories play into academic achievement that we will be able not only to improve the interventions available at the UW but also to extend extant theories of academic probation. Recently the project has extended variations of the original survey to high school and middle school students. We are also trying to make the survey available online, so the information is reported directly and more efficiently.

HERB COMMUNITY CHANGES IN THE APOSTLE ISLANDS NATIONAL PARK SINCE 1958

Aliza Segal, and Don Waller (Mentor), Botany

Recent studies show a correlation between deer browse and decreases in plant species richness and increased homogenization across Wisconsin forest communities. The Apostle Islands provide a unique setting to examine effects of deer browse on understory plant communities due to variation over islands in deer presence. In summer 2005, we resampled herb species in 32 Apostle Island sites previously sampled in 1958. We are tracking trends in species richness and community changes to connect herb composition changes to shifts in deer abundance. We expect to find decreased richness correlated to higher deer abundance in across temporal changes and islands. Our analyses provide important insights of use to the Park Service in managing these diverse forest communities.

HOMICIDE BY INTOXICATED USE OF A VEHICLE SENTENCE RANGES UNDER INDETERMINATE, TIS I AND TIS II.

Michael Mason, and Nina Emerson (Mentor), Law

This project is being conducted for the UW Law School's Resource Center on Impaired Driving. Presently, there is no known "standard" sentence for homicide by intoxicated use of a vehicle and the sentences given vary in length. This research aims to calculate the standard sentence for this offense and provide a quantitative analysis to determine an accurate description of what sentences are being given and document the ranges for the phases of legislation Wisconsin has implemented: indeterminate and Truth in Sentencing I and II. The Wisconsin Department of Transportation provided names of every individual convicted of this crime in Wisconsin from 2000 to 2002. Using the Wisconsin Circuit Court database, the cases were examined based on four elements of the sentence: license revocation, prison time, extended supervision, and probation.

HOW CHILDREN UNDERSTAND EMOTIONAL INTENSITY: ALL-OR-NONE OR A MATTER OF DEGREE?

Anika Ingham, and Charles Kalish (Mentor), Educational Psychology

This project is a study of children's understanding of emotional terms. It is building off of past work which studied children's understanding of spatial terms (big, tall) and showed that children first understand these terms categorically and only later appreciate relative magnitude. This study is looking to see if two-year-old children can differentiate between degrees of emotion and appreciate that emotions vary in intensity. The children are shown a set of pictures and are asked to pick the extreme in each case. The purpose of the study is to see if emotional intensity is more or less difficult than other dimensional adjectives for two-year-olds to think of on a continuous scale. The results of this study will aid in our understanding of cognitive development.

HOW DOES IT STICK: CHARACTERIZING THE CANDIDA ALBICANS EAP1 ADHESION DOMAIN

Joel Wagner, and Sean Palecek (Mentor),
Chemical and Biological Engineering

Candida albicans is an opportunistic fungal pathogen. It presents a severe, and often lethal, threat to individuals who have a compromised immune system, such as HIV/AIDS patients and those undergoing treatment for cancer. *C. albicans* infections are characterized by the formation of a biofilm, a community of *C. albicans* cells that cluster together through cell-cell and cell-substrate adhesion. The *C. albicans* gene EAP1 has been shown to be responsible for biofilm formation in vitro and in vivo. Within EAP1, an adhesion domain has been identified as being responsible for cell adhesion. The goal of this project is to determine what this adhesion domain specifically binds during biofilm formation. Green fluorescent protein has been fused to the adhesion domain to visualize binding in vitro.

HYDROXYLAMINE REDUCTION IN HUMAN LIVER INDIVIDUAL VARIABILITY

Aleeza Roth, and Lauren Trepanier (Mentor), Medical Sciences

Sulfamethoxazole (SMX) is the drug of choice for secondary infections in immuno-compromised patients. However, hypersensitivity reactions to SMX limit the usefulness of this inexpensive and effective antimicrobial. A hydroxylamine metabolite of SMX (SMX-HA) is thought to lead to SMX hypersensitivity. SMX-HA is metabolized in humans by an NADH-dependent microsomal reductase system, consisting of NADH cytochrome b5 reductase and cytochrome b5. Dr. Lauren Trepanier's laboratory has found a genetic polymorphism in cytochrome b5 that markedly affects hydroxylamine metabolism. My project will be to measure variability in hydroxylamine reduction activity in 100 human liver samples, and determine the prevalence of genetic changes that alter the activity of this important detoxification pathway.

IDENTIFICATION OF NON WATER SOLUBLE COMPOUNDS IN CROCUS SATIVUS L. (SAFFRON)

Dan Hudson, and Christopher Day (Mentor), Botany

Currently there is very little proof as to the type of Crocus used during Hellenistic and Roman periods in ancient history. The purpose of this project is to locate a non water soluble component within saffron's three main compounds, Crocin, Picrocrocin and Safranal. Five distinct samples of *C. sativus* stemming from different regions of the Mediterranean will be used. Mass Spectrometry Analysis test and DNA sequencing will be performed upon each sample. Knowing which compounds to test for, will permit me to determine what type of Crocus was being used. Following this research I will be conducting archaeological digs in North Africa, Europe and the Middle East to verify my data.

IDENTIFYING CLASSROOM FEATURES SUPPORTING STUDENTS' MATHEMATICAL GENERALIZATIONS.

Nathan Rivera, and Amy Ellis (Mentor), Education

My research project is the observations of different high school students and how they learn and grasp the information giving to them about quadratic formulas. We will be visiting and observing classroom behaviors of high school students as a class and one on one. In efforts to understand how students generalize the information giving to them a particular setting. With a better understanding of how the students generalize the information we will be able to improve and alter the way we teach math today. So that it will help more students to grasp and understand more comfortably the concept of quadric formulas.

IGF2 EXPRESSION IN FETAL, ADULT, AND MALIGNANT RAT LIVER

Matthew Czarny, and Henry Pitot (Mentor), Oncology

Work in the Pitot Lab is directed towards understanding the process of cancer development in the rat liver, and one current investigation concerns the role played by the imprinted *Igf2* gene in this process. Imprinting restricts expression of a gene to only one of two copies in most cell types, and it has been suggested that loss of such regulation is an early event in cancer development. The Pitot Lab has employed a method by which one copy of the *Igf2* gene can be distinguished from the other in F1 rats of a Sprague-Dawley/Brown Norway cross. Using this method, this study aims to demonstrate loss of regulation of *Igf2* in malignant liver as compared to fetal and adult liver.

IMPACT OF NEWBORN SCREENING ON PARENT-INFANT RELATIONSHIP

Jade Rosario, and Audrey Tluczek (Mentor), Psychiatry

The purpose of the Parent-Infant Study is to determine how the results of newborn screening affect the relationship between parents and infants. Another goal of the study is to assess the parents' emotional distress due to the results. The groups of families that we study are families with children who have CF, hypothyroidism, are CF carriers, and a healthy control group. We conduct observations, interviews, and tests when the infant is six weeks, six months, and twelve months old. The main hypothesis is that parents of children with CF will show more disturbances in their attachment with their infants than the other groups. There has been some evidence indicating the hypothesis may be true but the project is still in the data collection stage.

INCREASING ACCESS TO HEALTHCARE

Vo Thy, and Alfonso Morales (Mentor), Sociology

For Hispanics language differences cause barriers to healthcare access and information. The goals of our study are to 1) examine the disparities in access to cancer screening services by language among Hispanic Texas residents and 2) study the reasons for these disparities within group healthcare practices by residence in border and non-border counties. The study is conducted in English and Spanish on the non-institutionalized state population ages 18 and older using both 2000–2004 surveys from Texas Behavioral Risk Factor Surveillance (TBRF). The data found suggested that Spanish-speakers' disparities in the utilization of healthcare services are associated with their limited access to health care and precarious health status. Our research reveals the need to understand the cultural perspectives in which people understand and use healthcare services.

INFANT-PARENT INTERACTION LAB NEWSLETTER

Rebecca Nault, Laura Sheridan, and Julie Poehlmann (Mentor),
Human Development and Family Studies

The Infant-Parent Interaction Lab Newsletter was created to inform parents of the preliminary results of Professor Poehlmann's research study of preterm infants. The methods used to produce the newsletter included establishing what results and information were needed, producing graphs and data, and generating descriptions that are easy to read for the participant parents. The resulting data included in the newsletter are on infants weights, locations, gestational age at birth, health risks, number of children in families, maternal depression, and sleep habits. Through developing this newsletter, we have learned that although this study isn't complete, a vast amount of knowledge can be learned from the data. Additionally, we discovered that this will be a tool for parents to understand their child's development.

INITIAL CHARACTERIZATION OF $\text{Actg}^{-/-}$ MICE

Kurt Prins, and James Ervasti (Mentor), Physiology

γ_{cyto} -actin is thought to be essential for development and hearing. To investigate the physiological mechanisms underlying these phenomena, we generated mice lacking γ_{cyto} -actin. Surprisingly, $\text{Actg}^{-/-}$ mice were viable, although they experienced partial embryonic lethality, altered growth patterns, and a shortened life span. Western blots showed slight increases in β_{cyto} -actin and α_{smooth} -actin in the kidney and small increases in γ_{smooth} -actin in temporal bone. γ_{cyto} -actin was not necessary for formation of auditory hair cells or stereocilia, implying that γ_{cyto} -actin is not necessary for hair cell and stereocilia formation. Stereocilia formation in absence of γ_{cyto} -actin suggests that the mechanism underlying deafness caused by mutated γ_{cyto} -actin results from altering the affinity of an actin-related protein. The viability of $\text{Actg}^{-/-}$ mice raises the question why γ_{cyto} -actin's sequence is conserved from birds to humans if life is possible without the protein

**INSTITUTIONS OF GLOBAL GOVERNANCE:
INTERNATIONAL ATOMIC ENERGY AGENCY
PROF CLARK MILLER, A. BOWMAN**

Anne Bowman, and Clark Miller (Mentor),
LaFollette School of Public Affairs

I am researching the International Atomic Energy Agency (IAEA) and the role science experts play in creating policy that controls the world wide use of atomic energy. The United Nations established the IAEA in 1957 to secure peace and the safe pursuit of atomic energy. Using primary sources, written and distributed by the IAEA, I am focusing on the creation of the International Atomic Energy Agency and its first two decades in operation. In addition, I am unraveling the ideas and the people that formed the IAEA. Today, with increasing amounts of terrorism, the IAEA continues to prove itself as a critical component of global governance.

INTERVIEW EFFECTIVENESS

Marty Lezama, and Stefanie Halverson (Mentor), Business

This project involves analyzing and rating a series of interviews that were recorded in the mid 90's. Our groups role in this research is to rate the interviewees on the content of the participants answers, disregarding any biases such as physical attractiveness, social skills, nonverbal behavior, race, and gender. After rating many interviews it came to my attention that participants who tended to be more introverted had lower ratings than those who were very conversant. Curiosity in these areas has led me to investigate the impact of personality on a person's interview performance. The participants' personality had been assessed by self-report before the study was conducted. I will explore the correlation between applicant's self-reported personality and our ratings of interview performance.

INTERVIEW EFFECTIVENESS

Rebecca Strauss, and Stefanie Halverson (Mentor), Business

Biases including physical attractiveness, social skills, nonverbal behavior, race, and gender have been shown to influence the outcome of job interviews in the general population. Our project explores the effects of these extraneous sources of information on interview performance. We viewed videotapes of interviews and rated them on quality. We will examine the relationship between the different sources of extraneous information and interview performance. The research we are doing currently is very important since we are helping to predict the results of a study that could potentially expose biases and help increase interview skills.

INTERVIEW EFFECTIVENESS

Kayla Hall, and Stephanie Halverson (Mentor),
Social Sciences: Business/Psychology

The research I've been doing is entitled, Interview Effectiveness. Its purpose is to examine the predictors of interview effectiveness. I, along with others, have been rating tapes of interviews. I am particularly interested in the effects of race on interview effectiveness. I feel that it is important to know if there is a correlation between race and how well one does on an interview, which could show and maybe improve disparities.

INTERVIEW EFFECTIVENESS

Filiz Yucebay, and Stefanie K. Halverson (Mentor),
Women's Studies Program

Often in interviews biases can determine if an individual will receive a job or not. Physical attractiveness, social skills, nonverbal behavior, race, and gender are the main influences that affect these biases. Our project explores these biases by rating an individual's interview performance on videotape. We will then determine the effects of these biases based on their performance. With this information we can then predict the results of a study that could expose these biases. I am particularly interested in the effects of nonverbal behavior on interview effectiveness. Our research is important because it could potentially help increase an individual's interviewing skills.

INTERVIEW EFFECTIVENESS: THE CORRELATION BETWEEN GRADE POINT AND INTERVIEW PERFORMANCE

Robert Luchsinger, and Stefanie Halverson (Mentor), Women's Studies

The interview has developed into a crucial aspect in the selection process for most modern day occupations. Many factors contribute towards the outcome of this event including physical attributes such as intelligence, gender, age, race, and physical attractiveness. Other aspects are behavioral, such as effective verbal and nonverbal communication. Our project explores possible correlations between interview performance and these attributes. My personal research looks for a link between intelligence (as measured by grade point average) and interview performance. Research was conducted through reviewing videocassettes of mock interviews and grading aspects of their presentation using a seven point Likert Scale. Data was then tabulated and analyzed using the program SPSS. Our results will benefit the public by showing what employers search for in professional candidates.

INVESTIGATION OF GROWTH RATES OF SELECTED GOLDENROD SPECIES FROM PRAIRIES NEAR THE MADISON AREA.

Adam Rasmussen, and Michelle Harris (Mentor), Biocore

In fall 2005 we noticed that Goldenrod plants in a prairie 20 miles west of Madison, Wisconsin grew more densely and taller than Goldenrod in the Madison Arboretum. The purpose of our investigation is to determine whether the summer 2005 drought caused growth differences. In order to do this, rhizomes collected from both prairies will be planted in a greenhouse under the same conditions. The plants emerging from rhizomes will be genetically identical to plants growing in the prairies last summer. We hypothesize that there will be no growth differences between the plants from the two prairies. Seedling height and stem diameter will be measured regularly to determine if there is a difference between the two prairies.

INVESTIGATION OF PARAPROFESSIONAL ROLES AND SUPPORT NEEDS

Danielle Pelsue, and Erik Carter (Mentor),
Rehabilitation Psychology and Special Education

Over the past decade, schools have become increasingly reliant on paraprofessionals to assist with the educational needs of students with disabilities. One concern of this trend is the inadequate role clarification, training, and supervision for paraprofessionals. The purpose of this study was to examine the training needs and opportunities of paraprofessionals. Three hundred thirteen paraprofessionals working in nine school districts were asked about their job-related tasks, knowledge, and training needs. Paraprofessionals reported performing a wide range of tasks with various levels of training. However, differences in paraprofessional responses were associated with grade level (elementary versus secondary schools) and school setting (general education versus special education classrooms). These data could guide school districts in the development and delivery of additional training and in-service opportunities for paraprofessionals.

IS EDUCATIONAL LEVEL RELATED TO EXPECTATIONS AND OUTCOMES OF NONDRUG PAIN TREATMENTS?

Rose Weber, and Kristine Kwekkeboom (Mentor), School of Nursing

Complementary therapies have become an increasingly popular treatment for pain and appear to work well for some people. Previous research indicates that users of complementary therapies are likely to have high levels of education. This study aims to determine how educational level impacts expectations and pain relief obtained with two nondrug interventions, guided imagery and progressive muscle relaxation. Hospitalized patients with cancer pain reported demographic variables and completed measures of outcome expectancy, pain intensity, pain-related distress, affect, and perceived control over pain before and after using the nondrug pain treatments. Findings regarding relationships between educational level, outcome expectancy and pain outcomes will be presented as well as implications for nursing practice.

IS THERE A RELATIONSHIP BETWEEN BIRD BODY MASS AND PASSIVE ABSORPTION IN THE SMALL INTESTINE?

Poonam Patel, and Shana Lavin (Mentor), Wildlife Ecology

Mammals and birds may absorb water-soluble nutrients in their small intestine using different pathways. Small birds (<200g) studied thus far have extensive passive (versus active) absorption compared to mammals of varying body masses, but no studies have determined if this is the case in larger bird species. We are testing this by performing in vivo bioavailability experiments in four larger avian species (pigeons, coots, pheasants, and mallards). We are also measuring mucosal surface area and intestinal enterocyte density as potential explanations for differences in the extent of passive absorption. Thus far, data has suggested that larger bird species rely less heavily on passive absorption for nutrient uptake, and we are currently in the process of conducting the histological comparisons.

LABORATORY MOVEMENT IN AMERICAN PUBLIC SCHOOLS

Jae Lee, and John Rudolph (Mentor), Curriculum and Instruction

This research examines the laboratory movement in American public schools from 1880 to 1915. The objective is to trace its origins so that its role in science education and in American society more generally can be better understood. This has been done by searching academic journals at the Memorial Library and through JSTOR, an online, fulltext database. Through data collection and analysis, we are finding the origin and purposes of this focus on laboratory instruction at this time in history. The analysis of this project has significant implications for the history of science education in America because it shows how education and American society have been shaped through this movement over time.

LAS MEDIDAS DE PRECAUCIN DE ENCENDIOS POR EDUCACIN (FIRE PREVENTION THROUGH EDUCATION)

Jason Gonzalez, and Irene Katele (Mentor), Legal Studies

The project entitled “Medidas de Precaucin de Encendios por Educacin (Fire Prevention through Education)” is a collaborative effort by the Town of Madison Fire Department, Centro Hispano of Dane County, and the University of Wisconsin - Madison to promote awareness and pre-incident planning for fire and life endangering emergencies among the non-English speaking Hispanic population within the Town of Madison. During the course of this project I created and presented workshops and distributed literature to the non-English-speaking Hispanic population of the Township, tailoring each session to the specific group’s needs. An EMS operations manual as well as a fire ground operations manual was created to ease confusion during emergency situations. The culmination of the project was a fire awareness event in a local public park.

LIBERATORS AND INTRUDERS

Charles Wong, and Mary Roberts (Mentor), History

American soldiers during the “European theatre” fighting against the German Nazi of the World War II in 1944–1946 were idealized as a great moment in history. Professor Roberts’ book *Liberators and Intruders* examines the relationship between American GIs and the French civilian population during their missions in France. To figure out how the American viewed the French and vice versa, French and American archives are used to explore both sides’ attitudes and perceptions. Preliminary studies in a few American GIs memoirs and in LIFE magazines from 1944 July to September largely reflect a large proportion of feminine depiction of France, as a nation of women, by the Americans.

LITERACY, CENSORSHIP AND INTELLECTUAL FREEDOM: THE INDEPENDENT LIBRARY MOVEMENT IN CONTEMPORARY CUBA

Kelsey Vidaillet, and Greg Downey (Mentor),
Journalism and Mass Communication

While the literacy rate in Cuba is over 97%, the purpose of this project is to investigate whether Cubans are allowed to read what they desire. More specifically, this paper will describe the current state of intellectual freedom on the Island through a detailed analysis of the Independent Library Movement. The three major research questions are: 1) What is the current and historical context of the independent library movement in Cuba? 2) What is the position of selected worldwide major library associations regarding their policy statements on intellectual freedom and access to information in Cuba, as well as their stance towards the independent libraries in particular? 3) Who are the independent librarians in Cuba, what do they do and under what conditions do they work?

MAKING MAXWELL STREET: A MARKET EXPLORED

Christopher White, and Alfonso Morales (Mentor), Sociology

The final goal of this research is the publishing of a book about Chicago's Maxwell Street Market. The open-air market is a long-standing tradition of Chicago's downtown and is vitally important to the culture and economy of the city. Through the use of library research a comprehensive report on the market will be written. Covering the economic, historical and social sides of the market and its vendors, the book will truly be all-encompassing.

MALE COMMON MARMOSSET RESPONSE TO NOVEL AND FAMILIAR OVULATORY SCENT IN fMRI

Carrie Broz, and Toni Ziegler (Mentor), Psychology

Anogenital scent secretions are important in the lives of common marmosets. They are necessary for mate recognition, mate choice and territorial marking. Previous studies show that ovulatory scent secretions of novel females produce different fMRI (functional magnetic resonance imaging) responses in males. This study focuses on male social-status between males in long and short-term pairings with females. Our approach includes collecting hormonal scent secretions from females during ovulation, later the responses of males when they're introduced to the scents are observed in fMRI. A better understanding of the responses of the male marmoset brain may lead to understanding human brain activity related to arousal and long term pairing. Through these discoveries, we can correlate our findings among primates to better comprehend the way brains work.

MATHEMATICAL MODELING OF BIOMOLECULAR MECHANISMS OF DOPAMINE IN PARKINSON'S DISEASE AND DRUG ABUSE

Abby Maki, Sheshali Wanchoo, and Amir Assadi (Mentor), Mathematics

Parkinson's disease (PD) is a progressive neurological disorder that is associated with the death of dopamine-producing neurons in the substantia nigra. The cause of the destruction of these neurons is not known. In our project, we will create mathematical models of neural networks of PD and that of drug abuse and compare the two, since similarity between PD and drug-abuse has been noted. Ultimately, our goal is to develop a quantitative method to hierarchically cluster associations between PD and drug abuse data. From this, we hope to identify the most significant families of genes that correlate best with improved behavioral responses.

MEDICATION ADMINISTRATION IN RESIDENT-CENTERED NURSING HOMES

Melanie Krause, and Barbara Bowers (Mentor), School of Nursing

Although many nursing homes claim to deliver resident-centered care (RCC), current definitions lack conceptual clarity and consistency. Nurses are left confused about what RCC is and how to implement it. This study aims to describe how staff incorporates RCC into medication passes. Data were gathered at two Midwestern nursing homes using a field research design. Twenty nurses and medication assistants were observed and interviewed. Data were analyzed using grounded dimensional analysis and theory was developed describing how staff conceptualize RCC, and the ways they incorporate it into their medication passes. Notable findings include: 1) conceptualizations of RCC vary across participants, 2) there are conflicts between RCC ideals and nursing care standards, and 3) staff report increased work loads and difficulty completing work within time constraints.

MITOCHONDRIA FROM BRAIN AND THE RETINALGANGLION CELL-LIKE RGC-5 LINE DIFFER IN SUPEROXIDE PRODUCTION

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

Abstract: We previously showed that superoxide production after retinal ganglion cell (RGC) axotomy is an early step in signaling apoptosis. To better understand the source of superoxide, we compared the production of superoxide with different substrates in mitochondria isolated from rat cerebral cells and the RGC-like RGC-5 line in the presence of specific mitochondrial electron transport chain (METC) substrates and inhibitors. Our results suggest that brain and RGC-5 mitochondria produce superoxide at different rates in the presence of METC substrates and inhibitors. This difference between these cell types may relate to RGC-selective death seen in diseases such as Leber's hereditary optic neuropathy.

MODEL STUDY OF THE BIS(THF) CORE OF TRILOBIN AND TRILOBACIN

Calvin Wysocki, and Steven Burke (Mentor), Chemistry

A model study designed to create an efficient synthesis of a UV active model system resembling the cis-2,5-disubstituted or trans-2,5-disubstituted THF ring of the bis(THF)core of the annonaceous acetogenins, trilobin and trilobacin, is described. Various attempts and pathways to the model system are detailed as are methods used to determine the stereoselectivity of diboration reactions on the cis-2,5-disubstituted and trans-2,5-disubstituted THF ring and to determine the relative reactivity in diboration reactions of the cis-2,5-disubstituted versus trans-2,5-disubstituted THF ring. Model system reactivity results are applied to the full synthetic pathways towards trilobin and trilobacin.

MODELING OF S. CERIVASAE SHMOOING AS A MEANS TO DETERMINE RESPONSE RATE TO CHEMICAL FACTORS

Nicholas Stong, and Amir Assadi (Mentor), Mathematics

*S. cerivasa*e undergoes two life life cycles. One is a diploid phase during which mitotic division, budding, can occur. If meiotic division occurs the cells spores develop into two separate cell types α and β . These cells release an α or β factor, a mating pheromone, that when binded by receptors in the opposite cell type creates a change in the cell membrane known as shmooing. My goal is to model an amount of shmooing at determine a rate of shmooing over time. To do this I will set out to model the change of a yeast cell from normal undisturbed condition based on a grayscale image of the cell. I will also need to determine whether the cell is budding or shmooing, which will be difficult in the case of bi-polar budding. I expect to be able to make an accurate comparison between a shmooing cell and a normal cell, that will change over time as the cell shmooes more completely.

MODELING REAL WORLD DATA USING ARTIFICIAL NEURAL NETWORKS AND STUDYING THEIR PROPERTIES

Jonathan Blomker, Adam Maus,
and Julien Clinton Sprott (Mentor), Physics

Power law distributions can be found in a variety of areas in nature, from the size of earthquakes to the number of trips a wasp makes, these laws dominate many natural processes. This project utilizes artificial neural networks to find power laws as well as other properties in samples of real world data. A method of training in these networks involves the use of simulated annealing which will be used to model data. The goal of the project is to find a relationship between the coefficients of the network and power laws. There is a possibility of finding a relationship between the slope of the power law and the Lyapunov exponent or the degree of nonlinearity of the artificial neural network as well.

NEUROPATHIC PAIN AND RESPONSE TO BRADYKININ B1 ANTAGONIST AMG8910 AFTER SPINAL CORD INJURY IN RATS

Shannon McChesney, and Gurwattan Miranpuri (Mentor),
Neurological Surgery

Neuropathic pain is defined as “Pain initiated or caused by a primary lesion or dysfunction or transitory perturbation in the peripheral or central nervous system” and occurs in $\frac{1}{3}$ of spinal cord injury patients. Patients of spinal cord injury are amongst the most resistant to analgesics, or pain killers. There are receptors in the brain known to mediate neuropathic pain; one is the Bradykinin B1 receptor. Bradykinin directly activates nociceptors and promotes the inflammatory response. At present, there exists no treatment for those who endure neuropathic pain. By inducing injury which results in neuropathic pain, this condition is investigated by determining how rats respond to B1 antagonist AMG8910 utilizing a thermal stimulus to test pain. BBB scoring is also implemented and compared to the development of pain. Continued research is focused toward future treatment options for those suffering from neuropathic pain.

NEUROPATHIC PAIN FOLLOWING SPINAL CORD INJURY

Ami Patel, and Gurwattan Miranpuri (Mentor), Neurological Surgery

Chronic pain is an adversity that follows spinal cord injury (SCI). The goal of this project is to investigate the specific molecular pathways that are altered after SCI. Controlled contusion injury given to rats in the T9 segment of the spinal cord reveal alteration in gene expression. Rats were injected with one of three substances: an antagonist that prevents pain expression, DMSO, which magnifies the pain, and saline, which is used as a control. Polymerase chain reaction (PCR) and Real-Time PCR (RT-PCR) procedures are performed for enhanced study of gene expression at a specific tissue type. Advancement in this research may lead to new therapeutic treatment in the effort to lessen neuropathic pain in SCI patients.

NEWBORN SCREENING AND PARENT-INFANT RELATIONSHIP

Melanie North, and Audret Tluczek (Mentor), School of Nursing

The purpose of the study is to examine the impact of newborn screening and the results on the relationship between parents and their infants, and other variables that might affect their relationship. Four groups are being studied: families with infants who are a) diagnosed with cystic fibrosis (CF), b) diagnosed with congenital hypothyroidism (CH), c) CF carriers, and d) healthy. Data about the subjects are collected using videotaped observations, parent interviews, developmental assessments, and self-report questionnaires. Data are collected at three points: when the infant is 6 weeks old, 6 months old, and 12 months old. The main hypothesis is that the parents of children with CF or CH will exhibit more task-oriented interactions with their infants. This project is still in the data collection stage and there has been little analysis done. The study has found that mothers with infants who received CF or CH diagnoses report more emotional distress.

NOCTURNAL DECLINE IN BLOOD PRESSURE IN LUNG TRANSPLANT PATIENTS

Carey Johnson, and Dorothy Lanuza (Mentor), Nursing

Nocturnal decline, a lowering of blood pressure (BP) during the nighttime, is a natural occurrence in healthy individuals. An alteration in this normal decline in BP is postulated to increase the risk of cardiovascular consequences for the patient. To study this phenomenon, patients wear an ambulatory blood pressure monitor (ABP) for a 48-hour period every 3 months. The ABP records their blood pressure every hour, so fluctuations can be monitored. Findings from Lanuza et al.'s ongoing longitudinal study of predictors of quality of life in lung transplant patients show a lack of nocturnal decline in almost 50% of subjects before transplant. Data will be analyzed to determine if lack of BP nocturnal decline before lung transplantation is predictive of cardiovascular complications post transplant. The relationships between altered BP and Quality of Life will also be examined.

ORIGIN AND MIGRATION OF LHRH NEURONS IN THE EMBRYONIC BRAIN OF CHLOROCEBUS PYGERYTHRUS

Nicholas Jubert, and Ei Terasawa (Mentor), Primate Research Center

Luteinizing hormone-releasing hormone (LHRH) in the hypothalamus is indispensable in the reproductive function of mammals. In this study the origin, development, and migration of LHRH neurons in the vervet (*Chlorocebus pygerythrus*) fetal brain were investigated using immunocytochemical staining with the antibody GF-6. Based on the morphology and migratory pattern, two different populations of LHRH neurons were discernible: The first population was found in the ventral forebrain at embryonic age (E)35 and the second population was found in the olfactory placode and terminal nerve at E38 and then the ventral forebrain at E40. Subsequently, the second LHRH neurons migrated into the hypothalamus. These results suggest that the origin and developmental pattern of LHRH neurons are very similar to those previously described for rhesus macaque (*Macaca mulatta*).

OUTBREAKS IN RESISTANT BACTERIA IN TRANSPLANTATION PREETI THAKER AND NASIA SAFDAR (MENTOR)

Preeti Thaker, and Nasia Safdar (Mentor), Infectious Diseases

The study looks at patients receiving all kinds of transplants in order to identify the number of outbreaks of infection post transplant. Outbreaks from 1966 to date in the U.S. will be analyzed in order to understand and calculate the proportions of all outbreaks caused by resistant bacteria such as Methocillin Resistant Staphylococcus Aureus. Methods of research include analyses of medical journal databases such as Medline. This research will then be statistically examined in order to better understand both qualitative and quantitative effects of transplantation. Doing so would confirm that a significant number of patients are building immunities to antibiotics after being treated. Moreover, the possibility of future research in enhancing drugs through fields such as pharmacology is quite prominent.

PAIN DIAGRAM STUDY

Weston Krohn, and Sandra Ward (Mentor), Nursing

This study will determine if color-coded pain diagrams completed by patients distinguish neuropathic pain from non-neuropathic pain. UW patients (N = 300) will complete a neuropathic pain questionnaire (NPQ), the Spielberger State Anxiety Inventory, and a pain diagram that will capture both the distribution (location) and the sensory qualities (e.g. “burning”) of the pain. These diagrams will be coded for dermatome and peripheral nerve mapping. Physicians will complete a survey to establish the patients’ diagnoses. Patients diagnosed as having neuropathic pain will be compared to those diagnosed as not having neuropathic pain with respect to: 1) pain distribution, 2) sensory qualities, 3) NPQ score, and 4) anxiety score. The findings will prove useful in the diagnosis and treatment of neuropathic pain.

PAM KLING/MIKE RAUSCH ACCESSIBLE KITCHEN DESIGN

Karen O'Brien, and Suzanne Scott, Ph.D. (Mentor), ETD

The premise of this research is to advance knowledge from the ID II course in residential design in the kitchen and accessible design areas. The project is for a real couple wishing to remodel their kitchen to be accessible for the wife, who uses a wheelchair due to injuries received in an accident. The challenge lies in developing a design that meets ADA guidelines, provides function for the able-bodied husband, is conducive to entertaining, integrates the living space, and is esthetically pleasing. The process involves client interviews, site visits and meetings, space-plan development, product research, and accessibility research. The result is to develop a plan that the client intends to implement, and to pull research and results together as material for the ID II class.

PARKING AND THE DEMAND FOR TWO-WHEELED VEHICLES

Andrew Pyatskowitz, and Eliot Mason (Mentor), School of Business

My project looks to make an economic model of the sale of two-wheeled vehicles in the United States. This model will include variables that would expectedly affect the sales of motor scooters and motorcycles. Variables that are expected to be included are: the price of gasoline, gross domestic product, average/variation of temperature, etc. These variables will be taken from U.S. government publications and websites. This project will add number of parking spaces to the model. We expect the parking space variable to have an inverse relationship with the demand for two-wheeled vehicles. This will help give a better understanding about the behavior of this particular market.

PATTERN RECOGNITION IN COMPLEX NONLINEAR SYSTEMS

Joseph Nelson, and Amir Assadi (Mentor), Math

In this project we will develop and implement new mathematical methods for capturing common nonlinear features for use in pattern classification of diverse complex systems. Specifically, we propose to develop a geometric approach in pattern recognition, and demonstrate its versatility with in vastly different application domains: (a) recognizing handwritten symbols, and (b) classifying micro-array gene expression. Our long-term plan is to further develop these methods for pattern recognition problems in regenerative medicine, such as cellular re-engineering and the study of gene expression data measuring the dynamics of stem-cell differentiation. A potential application of our results is to solve the computational biology problems that hinder UW researchers' experimental success in guiding stem cell differentiation to specific brain cells.

PERCEPTUAL LEARNING OF GEOMETRY FROM OBSERVATIONS OF DYNAMIC EVENTS

Joseph Oldenburg, and Amir Assadi (Mentor), Mathematics

To what extent does human discovery of the mathematics of “geometry” depend on the experience? Helmholtz, Henri Poincare', Einstein and Gibson are pioneers in the theories of geometry as they arise from human interaction with the environment. We propose an empirical framework to explore the role of learning and memory in discovery of geometry from observation of events. The main idea is to design an intelligent system that discovers abstract properties of Euclidean and Riemannian geometry from physical experience despite presence of noise and other confounding factors in its environment.

PLANT TOXINS, APHID INGENIOUS

Erik Johnsen, and Stuart Wooley (Mentor), Entomology

Plants contain numerous phytochemicals that influence herbivorous insect feeding and reproduction. For example, galling aphids (*Pemphigus betae*) prefer certain genotypes of narrowleaf cottonwoods (*Populus angustifolia*) based on the condensed tannin levels, a phytochemical that affects insect exploitation. Earlier results indicated that of 6 genotypes, one of them (genotype 996) had many fewer aphids (less reproduction) than the others. But, it is unknown what the condensed tannins levels are that affected galling aphid reproduction. Cottonwood leaf samples were analyzed for levels of condensed tannin, using a standard acetone:water extraction. Tannin levels are likely to show similar variation (genotype 996 will be different than the others). These results will be useful in determining the relationship among plants, herbivores, and predators influenced by phytochemicals present in particular species.

PREVALENCE OF CHILDREN'S HEALTH RISK BEHAVIORS IN TWO MIDWEST CITIES

Melissa Merrick, and Susan Riesch (Mentor), Nursing

Health-risk behaviors are defined by the Centers for Disease Control and Prevention as: "behaviors that contribute to unintentional and intentional injury; tobacco use; alcohol and other drug use; sexual behaviors,...unhealthy dietary behaviors; and physical inactivity". The purpose of this poster is to compare the prevalence of health risk behaviors from a 5th grade student sample in two Midwestern cities with the available data regarding this age group found in current literature. This study's data was obtained using the 21-item Children's Health Risk Behavior Scale. From the current literature, it is evident that much more research needs to be completed on the 10–14 year old age group and their engagement in these risky behaviors, as there is very little contemporary data available.

PRODUCING AND PURIFYING NOD FACTORS INVOLVED IN PLANT AND MICROBE SYMBIOSIS

Connie Vo, and Jean-Michel Ane (Mentor), Agronomy

Symbiosis helps plants to retrieve essential nutrients easily and to surpass stressful times. Legumes form symbiotic relationships with bacteria (rhizobia) that lead to the formation of a new organ on legume's roots called a nodule. Rhizobia produce Nod factors, signaling molecules required for the formation of nodules. The goal of my project is to produce and purify Nod factors. The purification relies on the property of Nod factors being both hydrophobic and hydrophilic molecules. The last step of purification is using a HPLC (High Performance Liquid Chromatography) step to ensure a high purity. The purified molecules will be used to test the responses of a legume plant (*Medicago truncatula*) to these factors.

PROTECTING THE BOWEL FROM UNINTENDED THERMAL INJURIES DURING RADIOFREQUENCY TUMOR ABLATION

Vijay Prasad, and Paul Laeseke (Mentor), Radiology Research

Radiofrequency ablation of malignant tumors in localized areas in the body can have unintended adverse effects on the surrounding structures. Specifically, the heat used to burn the tumor tissue away can cause thermal damage, which can cause severe pain to a patient. To prevent this from happening, both saline solution and 5% dextrose in water have been used as buffer between the tumor to be ablated and other surrounding structures. The purpose of this research is to determine the relative effectiveness of both of the buffer solutions by measuring the unintended thermal injuries to the tissue. My role in the research is to modify the study design to further test the effectiveness of the 5% dextrose solution. To do this, we will construct a model to simulate tumor ablation and incidental burning at different distances. To determine the optimum distance, the temperature and ex-vivo tissue data which suggests the least amount of unintended contact will be considered.

PROTEIN INTERACTIONS BETWEEN THYROID HORMONE RECEPTOR ALPHA DBD AND VARIOUS CARDIAC PROTEINS

Ashley Setala, Amy Umnus, and Eugene Kaji (Mentor), Cardiology

Our research seeks to find proteins that work in conjunction with thyroid hormone receptor alpha DNA binding domain (TR-DBD). To test for these interactions we performed a yeast two-hybrid screen, using TR-DBD as bait. We screened a cardiac cDNA library of mice whose hearts were stimulated with the thyroid hormone T3. We screened 140 pools each containing 3,000–5,000 bacterial plasmids. Out of the 560,000 colonies we screened we have obtained fifteen positive interactions. Once we have a positive result we extract the plasmid and sequence the DNA. Of the sequences we resequenced we found that the protein, latent transforming growth factor beta binding protein 4, is interacting with TR-DBD. It is necessary to confirm our results by at least one alternative non-yeast based assay.

PSYCHOLOGICAL DISTRESS IN MOTHERS OF HIGH RISK INFANTS: THE ROLE OF FAMILY SUPPORT

Melissa Crone, Laura Diercks, Emily Hahn, and Julie Poehlmann (Mentor),
Human Development and Family Studies

This research looks at the role of family emotional support in the relationship between infant neonatal health risks, child and partner stress, and subsequent maternal depressive symptoms. These data are part of a larger study on preterm infants at two time points, hospital discharge and four months post-term. The data were obtained using maternal self-report and medical records. It was found that mothers perceived more stress in the partner relationship when their babies were sicker at birth and they received less emotional support from extended family. The interaction between father emotional support and child related stress was a significant predictor of maternal depressive symptoms. In families raising medically fragile infants, stress and support from the partner and family are key contributors to maternal mental health.

QUANTITATIVE ANALYSIS OF COMPUTED TOMOGRAPHY (CT) PERFUSION

Kevin Martinez, and Aquilla Turk (Mentor), Neurological Surgery

Computed tomography (CT) Perfusion is a non-evasive imaging technique being used in the diagnosis of Carotid Stenosis today in the medical field. Since CT Perfusion is a relatively new imaging practice, there is not a great deal of quantitative data in the medical world. Up until now, medical professionals have been diagnosing Carotid Stenoses based on the CT Perfusion Images. A quantitative analysis of the CT perfusion numbers could produce a more reliable procedure of diagnosing Carotid Stenoses. We want to quantitatively analyze the set of numbers that CT Perfusion imaging produced on 29 patients that we evaluated. The numbers CT Perfusion produces could be useful in the understanding stenoses of the brain. CT Perfusion numbers could improve the non-evasive imaging techniques used today.

RADIOLABELING CARDIAC MYOCYTES WITH TRITIATED LEUCINE

Lucas Kressel, Carly Kuehn, and Eugene Kaji (Mentor), Medicine

Our lab has successfully been able to induce cardiac myocyte hypertrophy by treating myocytes with different agonists. In one assay of hypertrophy, after a period of treatment, we perform histology by staining the sarcomeres with a monoclonal anti-alpha actinin antibody. Recently, we have looked for a second method to assay for hypertrophy. We plan to do this by counting the amount of radioactive uptake by cardiomyocytes of tritiated leucine using a scintillation counter. With these two techniques, we want to know if gene deletions have an effect on the amount of hypertrophy in cardiac myocytes. By applying agonists at an assortment of concentrations, we hope to see a difference in hypertrophy between cardiac myocytes harboring various gene deletions.

REACHING LATINO CONSUMERS IN WISCONSIN - PARTNERSHIP, AWARENESS & EDUCATION

Maria Carbonell, and Karen P. Goebel (Mentor),

Reaching Latino Consumers in Wisconsin is an outreach program with three goals: 1) to establish a liaison between government agencies, community organizations and the media, 2) to raise awareness about Latino consumers' needs, 3) to educate Wisconsin Latino consumers about the most common frauds, how to prevent them and what organizations are available for help. To accomplish this, I have created a partnership among the Department of Agriculture, Trade & Consumer Protection (DATCP), Centro Hispano, and UW-Extension. I have also translated several publications into Spanish, produced press releases, conducted interviews with the media, and planned and coordinated a 72-person conference for other state agencies and community-based organizations to address Latino consumer issues. Wisconsin Latino consumers are already responding by contacting DATCP with consumer concerns.

REJECTED DONOR DATA: FOLLOW-UP FROM EXCLUDED OOCYTE DONORS QUESTIONNAIRE

Brittany Biaggio, and Steven Lindheim (Mentor),
Obstetrics and Gynecology

This project entails working with oocyte donors, who were unable to donate their eggs. The oocyte donors were rejected for various reasons, including cancelled cycles, family history, psychiatric reasons, and genetic reasons. Their reasons for rejection were compared using a questionnaire and phone interviews. The donors were asked questions about their disappointment and their feelings. There is also inquiry about whether the rejected donors received information or some type of professional help. This project was found to be significantly upsetting to those rejected. Some individuals sought counseling and one donor had suicidal feelings. Therefore, this donation program must take responsibility for following up on the rejected donors and policies for the follow-up must be established.

RESEARCHING FOR A FICTION NOVEL

Ashley Allen, and Lorrie Moore (Mentor), English

The purpose of this research is to obtain information to further the writing process of a fiction novel. To add to the realism of the situations presented in a novel, characters and locations are often rooted in factual people or locations. Therefore it is necessary to acquire as much information as possible about real things to complete the writing process. The aim of the research is primarily to aid the exploration of how something that begins in reality can make the transition into a world of fiction that mirrors our own. Since this research is for a fictional work, topics and results are wide-ranging and not very scientific. Research spans across many areas including internet research, live interviews, or travel to obtain information on location.

RETURNING TO THE LAND: REINVIGORATING THE ENVIRONMENTAL ASPECT OF THE WISCONSIN FFA

Craig Kohn, and Gary Lake (Mentor), Life Sciences Communication

The FFA is an organization dedicated to serving students with interests in agricultural and natural sciences. In 2005, a new national environmental program was created. Through a grant from the Wisconsin Idea Foundation, I served as the administrator for the Wisconsin FFA's environmental program, which tested the knowledge and skills of the participants in the environmental sciences. This position entailed designing and conducting a state competition and student training sessions, evaluating student performance, selecting a winner to represent Wisconsin nationally, and providing funding for scholarships within the category. The first Wisconsin FFA Environmental and Natural Resources Career Development Event was well-attended and has the potential for becoming one of the premier events of its kind in the country while preparing students for careers in ecology.

ROLE OF ATHLETICS ON DISABLED ADOLESCENTS

Amy Olsen, and James Ferris (Mentor), Communication Arts

How does athletic participation in disabled adolescents affect self-image? In my study I will examine disabled adolescents' self-image by asking about peers, family, what has come out of their involvement in athletics, and how they feel others view them. I will interview ten teenagers, spending one hour with each of them and tape recording their responses. During this individualized time I will receive a deeper understanding of their feelings and the issues they face. By tape recording them I will be able to review their exact words and pick out common themes among the answers. I'm expecting to find that athletic participation plays an important role in development of a positive self-image during adolescent years.

ROLE OF E3 UBIQUITIN LIGASE SCF-TRCP IN CHEMICALLY INDUCED SKIN CANCER IN TRANSGENIC MOUSE MODELS

Tara Demmer, and Vladimir Spiegelman (Mentor), Dermatology

The ubiquitin-proteasome system is involved in degradation of many proteins. -TrCP ubiquitin ligase is a key enzyme responsible for ubiquitination of regulatory proteins involved in tumor development. Studies by the Spiegelman lab have shown over expression of this E3 ubiquitin ligase -TrCP in chemically induced skin cancer in mouse models. The Spiegelman lab is currently looking at the effects of inhibiting -TrCP activity with its dominant negative form in transgenic mouse models. To this end we employ 2-stage chemical carcinogenesis model (DMBA, cancer initiator and TPA, tumor promoter). The effect of -TrCP on tumor development is currently being investigated in transgenic mice expressing dn-TrCP under control of inducible promoter.

**ROOT DEVELOPMENT OF MEDICAGO TRUNCATULA.
CHELSEA MARTIN AND G. LOUGNON (MENTOR),
AGRONOMY**

Chelsea Martin, and Geraldine Lougnon (Mentor), Agronomy

The establishment of the nitrogen fixing symbiosis involving the model legume *M. truncatula* is related to root development. Our goal is to demonstrate that the *dmi2* gene, required for symbiosis, is also involved in root developmental processes. For this purpose, the growth of wild type plants and *dmi2* mutants (TR25 and R38) is monitored daily for ten days with and without symbiotic bacteria. Statistical analyses show that in non-symbiotic conditions, wild type and TR25 mutant plants keep a similar root phenotype whereas R38 plants display a significantly different developmental pattern. We still need to determine if mutants respond differentially than wild type in their root architecture under symbiotic conditions. This study will allow us to better understand the role of *dmi2* in both developmental processes.

**SCREEN AFRICAN AMERICAN HEALTH AND EDUCATION
RESEARCH PROJECT**

Shee Chang, and Linda Denise Oakley (Mentor), School of Nursing

The goal for this research study is to measure biological, social, behavioral, and physiological risk factors for heart disease and depression in African American adults. The purpose of measuring many different risk factors is to be able to design a more effective description of the risk of heart disease and depression for some adult African American. In this research, we have three groups. The three groups are the focus group, screen, and education. In the focus group, we will be focusing on African American patient myths and beliefs. We check African American health, depression, and heart disease. In the screen group, we check patient height, weight, blood pressure, pulse, total cholesterol, and ask 65 questions. In educational group, we give patient health test. The purpose of this test is to discover if educational will help decrease patient risk for depression and heart disease.

SECONDARY METABOLIC INFLUENCES ON SOIL RESPIRATION

Timothy Mess, and Mike Madritch (Mentor), Entomology

Anthropogenic reductions in biodiversity have the potential to influence how ecosystems process nutrients and matter. Understanding the effects of aboveground intraspecific diversity on soil processes is particularly important. Individual genotypes within plant species can produce various quantities and qualities of secondary metabolites, such as tannins. Past work suggests that this variation likely influences soil processes, however the specific influence of tannins on soil processes is unclear. Using purified tannins from multiple genotypes of aspen, red oak, and sugar maple, we will employ microcosms to monitor soil responses to variation in aboveground tannin inputs. Soil respiration, extracellular enzyme activities, and nitrogen losses will be recorded for each microcosm throughout the experiment. Tannins will likely influence soil processes, but the exact magnitude and direction is unknown.

SEXUAL CONCERNS AMONG KIDNEY TRANSPLANT RECIPIENTS

Kateryna Skirnyk, and Rebecca Muehrer (Mentor), Nursing

The incidence of kidney transplantation continues to rise, with 15,331 performed in 2001. Studies have begun to identify the prevalence of sexual issues among kidney transplant recipients; however specific sexual concerns are unknown. The Sexual Concerns Among Kidney Transplant Recipients (SCATER) is a questionnaire developed to identify these concerns. The purpose of this project was to determine the content validity index (CVI) of the SCATER. A convenience sample of 20 kidney transplant recipients was asked to rate the importance and clarity of each item. The CVI was .82 indicating the majority of items were content valid. These results, an extensive literature review, and input from three expert panels suggest the SCATER has content validity. In the next phase of this project the SCATER will be administered to 350 kidney transplant recipients to investigate their sexual concerns.

SIMULATING THE POPULATION DYNAMICS OF PREDATOR-PREY INTERACTIONS

Shefaali Sharma, Nina Zitzer, and Don Porter (Mentor), Statistics

The purpose of this project is to examine and predict the population dynamics of predator-prey interactions through the development of a statistical simulation. Initially, density dependent factors such as birth and death rates are analyzed to determine the dynamics which could result in one of three conditions: cyclic stability, collapse of the predator population, or collapse of the prey population. These initial simulations are then expanded to include parameters regarding competition for resources, climate, carrying capacity, and other intrinsic and extrinsic factors relative to specific environments. These more detailed simulations allow us to make predictions about the population dynamics of a variety of predator-prey interactions occurring in a range of habitats and surrounding conditions. Additionally, beneficial and detrimental human interactions can be investigated in order to provide insight for the future.

SOCIAL SCIENCE AND SOCIAL REALISM IN TURKISH FICTION WRITING

Erica Nakanishi-Stanis, and Sarah Atis (Mentor),
Languages and Cultures of Asia

Citing the lack of critical evaluation toward fictional literature used as an ethnographic source in Turkish social science, this project attempts to isolate these instances, critique them, and bring to light the negative impact that these works have on rural Turkish communities. Though many of the fiction writers and those who cite them have good intentions for the villagers, their works only worsen perceptions of the rural life, strengthening a disparity between the two segments of the Turkish population: the rural and the urban. By citing these instances, it is hoped that the standards for use of fictional literature in ethnography will be tightened, and that social scientists will be more careful in what they choose to interpret as representative or factual about these communities.

SOCIAL VALIDITY OF PEER INTERACTION INTERVENTIONS IN SCHOOLS: EFFECTIVENESS, FEASIBILITY, AND USE

Matt Pesko, and Erik Carter (Mentor),
Rehabilitation Psychology and Special Education

As increasing numbers of students with severe disabilities are included in general education classrooms, researchers have identified effective social interaction strategies to promote meaningful peer relationships among students with and without disabilities. This study examined the perceptions of general educators, special educators, and paraprofessionals regarding the effectiveness, feasibility, and use of these strategies in inclusive classrooms. Although some differences in ratings were noted, educator groups generally evaluated strategies similarly. In addition, actual strategy use was strongly correlated with educators' perceptions of effectiveness and feasibility. Because these educators ultimately will decide for or against the implementation of these strategies in the general education curriculum, their evaluations regarding these intervention approaches are important to understand.

SOCIAL-CULTURAL AND MEDICAL INFLUENCES ON THE SLEEP BEHAVIORS OF PRETERM INFANTS

Bridget Pritzl, and Amy Jo Miller Schwichtenberg (Mentor),
Human Development and Family Studies

Early sleep regulation, which can be altered by medical and contextual factors, is crucial for optimal emotional, immune, and social development. This study assessed sleep in preterm/(LBW) infants from hospital discharge to 4 months. Measures included maternal reports of education, breastfeeding habits, and infant sleep. NICU nurses provided information on infant Respiratory Distress Syndrome (RDS), gestational age and weight at birth. Bivariate correlations revealed a strong association between breastfeeding habits and nighttime sleep, nightwakings, naps and sleep across each sleep/wake cycle. Maternal education was positively correlated with nightwakings and naps and negatively correlated with nighttime sleep. Unexpectedly, RDS was correlated with diurnal sleep. Further studies are needed to understand the malleable nature of infant sleep patterns and how these patterns may relate to later development.

SOLAR COOKING IN MURAMBA, RWANDA: SUBMITTED BY ADRIENNE KUEHL, MEGAN BENDER, BILL BROWER

Adrienne Kuehl, and Peter Bosscher (Mentor),
Civil and Environmental Engineering

Water quality and fuel shortages in the village of Muramba, Rwanda are persistent and problematic issues. To help alleviate these issues, Engineers Without Borders - UW Madison spent the past year designing solar cookers, a completely sustainable technology. As members of EWB, we went on an implementation trip July of 2005. The school year leading up to the trip was spent building and testing different designs and materials, learning about the country, and writing comprehensive manuals in English and French. During implementation water testing, consulting with local leaders, holding community workshops, and evaluating the structure for a larger solar project were completed. Our part of this project is complete, as the community leaders will continue to spread the technology throughout the area.

SPECIFICITY AND SENSITIVITY OF CLINICAL SCREENING QUESTIONS FOR CIGARETTE USE AMONG COLLEGE STUDENTS

Malini Soundarrajan, and Curtis Olson (Mentor),
Office of Continuing Professional Development

The first step for health care professionals in effective treatment of cigarette use and dependence is identifying all smokers in their patient population. Identifying cigarette users can be challenging because some users do not consider themselves “smokers”. The purpose of the present study is to determine the sensitivity and specificity of two screening questions for individuals falling into 5 categories of smoking behavior: non-users, experimenters, former smokers, addicted smokers, and “chippers” (persons who smoke regularly but do not experience withdrawal symptoms during periods of abstinence). A survey will be used test the hypothesis that various subgroups of smokers among students enrolled at the University of Wisconsin-Madison respond differently to the screening questions “Do you smoke?” and “Have you ever smoked?”

SPINAL CORD INJURY AND NEUROPATHIC PAIN

Jessica Tilghman, and Gurwattan Miranpuri (Mentor), Neurosurgery

Chronic neuropathic pain is a common complication resulting from spinal cord injury (SCI). However, little is known about the underlying processes of this phenomenon. Therefore, we aim to link gene expression with neuropathic pain following SCI in a rat model. To do so, experimental Sprague Dawley rats are administered a T9 laminectomy followed by spinal cord contusion. Control rats receive only the laminectomy. Hind limb paralysis and neuropathic pain behaviors are assessed with weekly post-injury open field and hyperalgesia tests respectively. Gene expression is then analyzed using real-time PCR. Through these experiments, we hope to accumulate a catalog of candidate genes related to the onset and preservation of chronic neuropathic pain.

STIFFNESS ANALYSIS FOR THE DESIGN DEVELOPMENT OF A PROSTHETIC FOOT

Anne Baus, and Heidi Ploeg (Mentor), Mechanical Engineering

The Niagara Foot™ is a high performance prosthetic foot developed as relief for landmine victims in developing countries. Version 3 of the Niagara Foot Model 1 was fully tested through field trials in Thailand and El Salvador and is used as a basis of comparison for newer versions. My research is to analyze the stiffness of the current design (Model 1, Version 3) and use these results as a base comparison for further design developments. Mechanical testing was performed to characterize the stiffness of the toe and heel of the current design and to validate a numerical model of the same design. Numerical modeling with finite element analysis will augment the mechanical testing to enable the analysis of design developments before they are manufactured.

SUPPRESSOR MUTATIONS AFFECTING MAP KINASE REGULATED CELL DIVISION IN ARABIDOPSIS THALIANA

Christopher Harvey, and Maria Christina Suarez-Rodriguez (Mentor),
Horticulture

MAP kinases are cell signaling proteins involved in cell division. Arabidopsis Thaliana mutants with inactive ANP2 and ANP3 MAP kinase genes present defects in cell division and develop into dwarf plants (Krysan et al., 2002). By introducing random mutations into these plants genomes, progeny occasionally displays normal sizes again, possibly due to the modification of other genes in the ANP2/ANP3 signaling pathway. In this project we are studying the genetic characteristics and location of a suppressor mutation linked to the rescued phenotype. We accomplish this by quantitative analysis of the segregation of the rescued phenotype in genetic crosses and microscopy observations of cell division defects. Our results will contribute to the knowledge about plant signaling pathways and cell division.

SYSTEMS BIOLOGY AND DIFFERENTIAL GEOMETRY OF NETWORKS

Rebecca Yale, and Amir Assadi (Mentor), Mathematics

Geometric concepts could provide insight for mathematical modeling real-world problems, especially in systems biology where large sets of data must be explored. We study the dynamics of gene networks that are implicitly encoded in gene expression microarrays that are collected from heart tissue. Methods from differential geometry are employed to separate noise from signal and imperfections of measurements. Networks are modeled as points in high-dimensional surfaces, and their dynamics as events governed by nonlinear systems of differential equations. We use the data to estimate the parameters of our model via operations from differential geometry combined with basic approximation theory and probability theory. The outcomes are refined when we use biological constraints to estimate the probability of events.

TECHNOLOGY AND EMPLOYMENT SEGREGATION: EFFECTS ON FEMALE COMPUTER PROGRAMMERS AND SOFTWARE ENGINEERS

Jennifer Bernstein, and Leann Tigges (Mentor), Rural Sociology

As a result of educational restraints, a dearth of experienced female computer scientists and engineers makes it unlikely that women will reap the benefits of the U.S. Labor Department's projected growth for the field of software engineering. Additionally, factors within software development firms, such as the type of software development and the effects of corporate culture, may create additional barriers to women's careers in the field. This research study examines the occupational experiences of female computer programmers and software engineers and determines how these experiences parallel occupational sex segregation in other occupations. This study utilizes in-depth, onsite case studies and uses current sociological theories of occupational sex segregation as a guide. Each case is compared and evaluated to determine whether the factors facilitate or impede women's employment in this vital economic sector

THE AMINOGLYCOSIDE GENTAMICIN PROMOTES THE ESCAPE OF RNA POLYMERASE II FROM THE HIV-1 LTR PAUSE SITE

Anai Kothari, and Robert Landick (Mentor), Bacteriology

Human RNA polymerase II (RNAPII) recognizes a strong transcriptional pause at +U62 in the HIV-1 initially transcribed region. We tested several aminoglycosides for their effect on pausing. Gentamicin promoted escape of RNAPII specifically from the HIV-1 pause site in a concentration-dependent manner and was independent of RNA secondary structures. Gentamicin might interact directly with the RNA or with the polymerase to mediate its effect on pausing. To evaluate these two possibilities, we will (1) test the effect of truncating the RNA, (2) test the ability of gentamicin to compete for RNA binding sites on polymerase and (3) test if gentamicin interacts in the secondary channel of RNA polymerase. Results from these experiments should provide an insight into the mechanism of action of gentamicin.

THE ATTACHMENT STORY COMPLETION TASK: A GUIDE TO ADMINISTRATION

Emily Hahn, Vanessa Palomino, and Julie Poehlmann (Mentor),
Human Development and Family Studies

The Attachment Story Completion Task (ASCT), developed by Inge Bretherton, is used to assess attachment in children three to six years old. In this context, the ASCT is being used as part of a larger study to assess the attachment styles of pre-term infants at thirty-six months post-term. The goal for this project is to develop a training manual to assist future experimenters in learning the task. We will begin with a brief introduction including the history and background of the measure and an overview of attachment. We will focus on the administration (including rapport, interviewing, standardization) and coding. Last, we will offer tips and strategies for experimenters. Upon completion, we hope this manual will be a comprehensive guide to successful administration of the ASCT.

THE CELLULAR BASIS OF MORPHOGENESIS IN CAENORHABDITIS ELEGANS EMBRYO DEVELOPMENT

Timothy Algiers, and Jeff Hardin (Mentor), Zoology

This research seeks to identify the genes responsible for and gene expression associated with cell motility and adhesion and cell intercalation in epithelial cell development using the model organism *C. elegans*. *C. elegans* provides a useful research model because of its precise cell lineage. Gene expression is identified through insertion of green fluorescent proteins (GFP's), marker genes that cause cellular regions to glow when viewed under fluorescent microscopes. Genes are modified using double-stranded RNA-mediated interference (RNAi) to block gene expression. The effects are observed through four dimensional microscopy (Nomarski technique) of affected embryos, and by genetic analysis through polymerase chain reaction (PCR) and gel electrophoresis. A deeper understanding of these processes in model organisms such as *C. elegans* will add insight in more complicated organisms.

THE EFFECT OF PROBABILISTIC EVIDENCE ON CATEGORY BASED INDUCTION

David Kang, and Chris Lawson (Mentor), Educational Psychology

Making inference is an essential in life activity. Making decisions in cross category situation is affected by how certain or uncertain we are based on given evidence. Thus research examined how children make inferences and how they make correlation in cross categorical situation. We studied the children in order to learn how they make deductive and inductive probabilistic inference when given evidence that was either perfect or imperfect. We also looked at how they react in cross categorical situation. The experiment showed that in perfect situation, the deductive reasoning resulted in high confidence in children, however, in cross categorical situation, where inductive reasoning, showed a sharp decrease of confidence. This will show how we make decisions when associating one kind of information to different situations.

THE EFFECT OF TYPE 1 DIABETES AND AMENORRHEA ON BONE MINERAL DENSITY LEVELS IN YOUNG WOMEN

Alesha Shaver, and Mari Palta (Mentor), Population Health Sciences

Low bone mineral density (BMD) is common in young women with type 1 (insulin-dependent) diabetes, as well as women with amenorrhea (temporary cessation of menstruation). Furthermore, women with type 1 diabetes have higher rates of amenorrhea. This analysis will determine and compare BMD levels in women based on type I diabetes and amenorrhea status. As part of the Wisconsin Women and Diabetes Study, we examined 89 women between 18–50 years old with diabetes from the Wisconsin Diabetes Registry and 76 women without diabetes. Data collection consisted of BMD measurements of both heels and wrists, and questionnaires on medical history. These findings may indicate the potential importance of restoring menstrual cycles in young women with type 1 diabetes to minimize the additional risk of osteoporosis.

THE EFFECT OF VEGETATION ON THE ABUNDANCE AND DIVERSITY OF EARTHWORMS IN URBAN SYSTEMS

Ariel Schimek, and Nick Balster (Mentor), Soil Science

Urbanization typically compacts soil, which leads to increased soil bulk density and therefore decreased plant and animal life. Earthworms offer a possible remediation of this effect, as their activity has been shown to decrease soil density via creation of macroporosity and increased connectivity of pore space. However, little is known about the diversity and abundance of earthworms in urban systems, especially due its inherent spatial variability in vegetation. In this study, we are quantifying the diversity and abundance of earthworms in urban systems relative to changes in vegetation (bluegrass lawn vs. prairie gardens). We will use these data to compare with previously measured physical differences in soil structure between sites to test whether earthworms influence such changes.

THE EFFECTS OF CADMIUM ON A XENOPUS TROPICALIS LIFE CYCLE EXPOSURE MODEL

Samantha Mueller, and Jackson Gross (Mentor), Wildlife Ecology

This study's purpose is to develop and characterize a life cycle exposure model using an alternative amphibian model *Xenopus tropicalis*. Cadmium (Cd), a ubiquitous environmental pollutant, has been shown to alter development in native amphibian species. To assess Cd's toxicity on amphibian development, from fertilization through reproduction in adulthood, we conducted a series of larval exposures to varying doses of cadmium for 3, 10, 22, and 55 days assessing survival, growth, and development. Flow-through diluter technology was used for the 10, 22, and 55 day exposures. While *Xenopus tropicalis* is considerably less sensitive to Cd than native amphibians, its quick developmental time and ease in handling and breeding make this a good surrogate model to examine the harmful effects of environmental pollutants in amphibians.

THE EFFECTS OF CADMIUM ON SURVIVAL AND GROWTH ON THE AQUATIC SNAIL, PLANORBELLA TRIVOLVIS

Rodney Rodgers, and Jackson Gross (Mentor), Wildlife Ecology

This study examines the effects of cadmium, a ubiquitous environmental pollutant on an aquatic snail. Freshwater Planorbid snails are the first intermediate host in the lifecycle of *Ribeiroia ondatrae* a trematode fluke known to cause limb malformations in amphibians. The purpose of this study is to examine the effects of cadmium on the life history of the parasite, specifically the survival and egg production of its snail host. We exposed *Planorbella trivolvis* (n=7 snails per treatment) to 5.0, 20.0, and 100.0 ug/L of cadmium for sixty days. Every third day snail survival and egg production was assessed. This study will add to a larger study that is examining the interaction of heavy metal pollution and parasites on amphibian limb malformations.

THE EFFECTS OF DOA4 ON BROME MOSAIC VIRUS REPLICATION IN SACCHAROMYCES CERVISIASE

Zaban Nick, and Xiaofeng Wang (Mentor),
Institute for Molecular Virology

The Brome Mosaic Virus (BMV) is an RNA plant virus that is studied in the yeast *Saccharomyces cervisiase* to understand virus host interactions in many similar viruses such as SARS. Like other RNA viruses, BMV forms vesicles that protect the replication of its RNA. A protein that may affect replication is DOA4, which removes the polypeptide ubiquitin and is involved in the proteasome and multivesicular body pathways. The effects of DOA4 on replication are studied using nucleic acid transformation, purification, electrophoresis, and radio-labeling techniques. Mutant DOA4 yeast showed a decrease in BMV replication. When wild type DOA4 with the endogenous promoter was reintroduced, cellular processes could be complemented, but not BMV replication. Replication may be complemented using wild type DOA4 with a strong *Gall* promoter.

THE EFFECTS OF ETHYLENE ON GROWTH AND MOVEMENT IN ARABIDOPSIS CA²⁺ TRANSPORTER MUTANTS

Claire O'Leary, and Brad Binder (Mentor), Botany

Ethylene is a plant hormone involved in many developmental processes. In dark-grown Arabidopsis seedlings it causes growth inhibition, growth of root hairs, closure of the apical hook, and nutational movements. Nutations are a nodding motion that have been linked to auxin, a hormone whose transport through the plant may depend on Ca²⁺. To identify Ca²⁺ transporters that could be involved in the signaling pathway, a time-lapse imaging system was used to analyze nutations in Ca²⁺ transporter mutants. Identifying specific Ca²⁺-related genes involved in the ethylene signaling pathway that leads to nutation will help in developing a model for signal transduction. This will enhance our ability to control many economically important ethylene-dependent plant processes such as the wilting of flowers and the ripening of fruit.

THE EFFECTS OF NEEDLE TEMPERATURE ON PAIN RATINGS FOLLOWING INTRAMUSCULAR INJECTION

Katie Roberts, and Mary Hayney (Mentor), Pharmacy

Pain is a leading cause people self-defer from vaccinations. The purpose of the study was to determine whether giving intramuscular injections (the route many vaccines are given) using a frozen needle would decrease the patients' perceived pain. 80 participants received one injection of influenza vaccine and of saline. Participants placed an "x" along a labeled continuum to rate their pain after each injection. The mean pain score for influenza vaccine with room temperature needles was 36.0mm (Å}3.80) and with frozen needles 32.2mm (Å}3.20) (p-value = 0.450). The mean pain scale for saline injection with room temperature needles was 23.7mm (Å}3.19) and with frozen needles 25.2mm (Å}2.95) (p-value = 0.733). Although results trended in a significant direction, but frozen needles did not significantly reduce injection pain.

THE EFFECTS OF NUTRIENT ENRICHMENT ON GREEN FROG TADPOLE (*RANA CLAMITANS*) PARASITIC INFECTION

Samantha Nagy, and Jason Gross (Mentor), Wildlife Ecology

Ribeiroia ondatrae; a parasitic flatworm with a complex lifecycle has been implicated in amphibian malformations throughout the United States. *Rana clamitans* tadpoles were placed in artificial mesocosms at the University of Wisconsin Trout Lake field station in June of 2005 and raised with snails infected with the trematode in a no, low, or high nutrient environment. Higher concentrations of nitrogen and phosphorus increased algal growth leading to increased availability of food resources and higher snail reproduction which improved the probability of tadpole infection. In the fall, tadpoles were transported to the lab where they were raised for about six months. This research examines growth, development, and malformations in *Rana clamitans* tadpoles exposed to this trematode.

THE EFFECTS OF PERCHLORATE ON GROWTH AND DEVELOPMENT IN *XENOPUS TROPICALIS*

Matthew Meyer, and Jason Gross (Mentor), Wildlife Ecology

Perchlorate, a water soluble environmental pollutant commonly used in explosives, disrupts iodide uptake in the thyroid gland. In amphibians, perchlorate has been shown to inhibit metamorphosis. We chronically exposed tadpoles of a model amphibian species, *Xenopus tropicalis*, to environmentally relevant sublethal levels of perchlorate via a continuous flow toxicant delivery system. Tadpoles were exposed to four doses (62, 250, 1000, 4000 ppb), a control, and water treatment facility effluent. Developmental stage, tadpole length and malformations were measured at the end of the study period. While no significant effect of perchlorate was seen in the dosed treatments, larvae in the water treatment facility effluent developed sooner than controls. This is the first study to explore the effects of perchlorate on *X. tropicalis* tadpoles.

THE EXPERIENCE OF MISCARRIAGE

Kelly Maas, and Mary Ellen Murray (Mentor), Nursing

The purpose of this research is to explore the decision-making process for women facing an inevitable miscarriage (IM). Each participant completed a demographic questionnaire and a 30–45 minute open-ended telephone interview that was recorded, transcribed, and analyzed using the Qualitative Description Method. Women facing an IM had multiple decisions including: 1) time of admission to healthcare facility, 2) accompanied or alone, 3) medical treatment choice. Shared decision-making was present in some cases and wanting to “be sure” fueled the decision-making process. It appears from the findings that decision-making at the time of the miscarriage is less important to women than the relationship with the provider. Future longitudinal research could inform as to whether the decision-making process becomes more important over time and affects subsequent adjustment.

THE HMONG LITERACY, LANGUAGE, & JOBS PROJECT

Sheridan Griffing, and Marlys Macken (Mentor), Linguistics

This project began for the Hmong refugees that have recently moved to Madison from Wat Tham Krabok in Thailand. The project provides (1) classroom instruction and tutoring to teach English, literacy, and workplace literacy; and (2) specific employment skill instruction, onsite job training, and employment placement. The language and literacy classes are at Northport Community Center, and HLLJP partner. MATC, another partner, provides carpentry and wood refinishing classes. Through a service learning and tutoring curriculum, each refugee receives two+ hours weekly of one-on-one language and literacy instruction working with UW students and volunteers. The UW SWAP unit provides wood furniture for wood refinishing classes; and the refugees may keep the refinished furniture. Plans are in progress to create a minority-owned, wood refinishing business.

THE LEGACY OF CARMEN MIRANDA

Sarah Kenner, and Kathryn Sanchez (Mentor), Spanish and Portuguese

This project seeks to reveal the impact of Brazilian icon Carmen Miranda on American media culture in the 1940s. My research focuses on examining articles and films that include the luminary or her homeland of Brazil. My research is conducted in the library, where I review these texts for information regarding Miranda. Through the analysis that I am conducting, I am contributing information that will assist my mentor, Professor Sanchez in completing a document concerning the star. The information gathered provides additional support in Professor Sanchez's pursuit of concluding her own research. This study uncovers many interesting facts about the life and career of Carmen Miranda.

THE MILITARY AS A POLICE SERVICE: KFOR'S FAILURE TO FILL THE POLICING GAP IN KOSOVO

Carmen Marg-Patton, and Scott Straus (Mentor), Political Science

In 1999, the NATO force KFOR attempted to fill the policing gap that had developed in Kosovo. My research was focused on determining to what extent KFOR succeeded in filling this gap. I looked at the level of organized crime, amount of ethnic violence and freedom of movement of minorities to determine KFOR's success or failure. In my paper, I argue KFOR failed to fill the policing gap because it was a military institution trying to fill a position traditionally held by a civilian institution. This failure had lasting consequences, creating an insecure environment in Kosovo. Hopefully, lessons learned from this research will help military institutions who are filling a policing gap avoid the problems KFOR stumbled over.

THE RESPONSE OF CAP OF CAPTIVE BORN COTTON TOP TAMARINS (SAGUINUS OEDIPUS) TO PREDATOR VOCALIZATIONS

Sagan Friant, and Charles Snowdon (Mentor), Psychology and Zoology

The response of Callitrichid monkeys to predators has been studied in both captivity and the wild. Typical predators are hawks (raptors), cats (felids), tayras (weasel), and snakes. There is conflicting evidence concerning whether monkeys must learn fear of predators or whether predator fear is innate. This study used captive born tamarins that have lived indoors their entire lives with no previous exposure predators or vocalizations of predators. Results show the effects of raptor, cat, and tayra vocalizations on monkeys completely naive to predator stimuli. By eliminating the possibility of prior experience and learning when an animal is exposed to the outdoors, this study resolves whether captive tamarins exhibit innate responses to predators they should fear if introduced to the wild. (supported by Hilldale Award)

THE ROLE OF MET AND FERROUS-MYOGLOBIN IN LIPID OXIDATION CONDUCTED IN WASHED COD MUSCLE.

Chad Pendley, and Mark Richards (Mentor), Animal Science

Due to rapid discoloration and deterioration in meat during storage caused by lipid oxidation, the catalysts of this reaction are a focal point for current research. Previous experiments indicate that hemoglobin/myoglobin are the catalysts, and that the oxidative effect depends on the iron form in the heme (Fe(II) or Fe(III)). The catalytic effects of met and ferrous myoglobin in lipid oxidation were compared in a washed cod mince system. Lipid oxidation was monitored using TBARS and PV Method, and both methods indicated a higher degree of lipid oxidation in the mince containing met myoglobin. The suggested reason for this result involves the heme to globin structure in met myoglobin. These findings improve our understanding of the mechanism by which heme myoglobin promotes lipid oxidation.

THE STUDY OF EMOTIONS AND GENDER IN LEADERSHIP

Jessica Wesley, Shanequa Ellis, Darin Chokdee, and Stefanie Halverson (Mentor), Department of Management

The goal of this research project is to examine the effects of gender and expressed emotion on leadership perceptions. This investigation examines this question through two studies. First, a meta-analysis was conducted to establish the extent to which men and women differ on the expression of emotions. This study explored the perceptions of gender differences in emotion expression as opposed to the actual differences in the emotions being expressed. Secondly, the study examines the effects of gender differences in emotion expression on perceptions of leadership effectiveness through the use of vignettes. Male and female participants read about a male or female leader who expressed sadness, anger, or happiness in a crisis or non-crisis situation. Results are interpreted in terms of gender stereotypes.

THE THREE P'S HIV EDUCATION PROJECT: PARTNERSHIP, PEER EDUCATION, PREVENTION

Jamie Cohen, and Raymond Kessel (Mentor),
Medical Genetics and Professional Development

The objective of the project is to connect Madison Memorial High School students with South African students through the design, facilitation and implementation of a peer education project on HIV/AIDS with the goals of developing effective educational materials, bridging the gap of HIV/AIDS infection between domestic and international levels and creating students as powerful change agents.

THE WHITENING OF TANGO IN ARGENTINA: THE IMPACT OF RACE AND CULTURE ON NATIONAL IDENTITY

Nadya Prez-Reyes, and Francisco Scarano (Mentor), History

This project involves discovering how a Black musical and dance form, the tango, became one of Argentina's national symbols and in the process was identified as the product of white society. The objective is to show that through a process of discursive whitening, the tango (as well as earlier musical forms of Afro-Argentine origin) became socially and culturally acceptable. In the early 20th century, as elites tried to project a unified national identity, these musical forms were elevated to the status of national symbols. Although the tango, upon a cursory examination, may be conceived as a European-derived dance, it is clear upon further investigation that it is the result of a process of deliberate whitening through government campaigns, immigration, and the decline of Afro-Argentine population. By examining the true origins of the tango, this research serves to honor the important contributions of Afro-Argentines to a "white" Argentine national and cultural identity.

THE XHOSA'S ORAL TRADITION

Samantha Curry, and Harold Scheub (Mentor),
African Languages and Literature

I am going to build on the project that I began last semester, in which I take stories performed by Xhosa storytellers from South Africa and write analyses of these stories. Upon examining some stories, it has revealed that there is a particular style common between storytellers, such as the puberty ritual. The puberty ritual can reveal the structure of the story, which is dictated by the storytellers themselves. The results of my project so far have shown a deeper understanding of how the storytelling process works, how storytellers convey meaning in stories that are complex. The stories aren't supposed to be taken literally, but they are a way of revealing the truth. Upon revealing the truth it gives a person insight on the culture of the Xhosa people.

THOMSON SCATTERING DIAGNOSTIC CALIBRATIONS ON THE MADISON SYMMETRIC TORUS

Rebecca Shapiro, and Daniel Den Hartog (Mentor), Physics

The Madison Symmetric Torus (MST) is an experimental fusion device that can be used to investigate the source and effects of instabilities and turbulence in magnetically confined plasmas. The Thomson Scattering (TS) diagnostic measures the plasma temperature and density by collection the photons of light scattered by the free electrons in the plasma. Using a set of four-channel polychromators equipped with avalanche photodiode (APD) detectors, the system monitors 21 different spatial positions along a laser beam sent through the plasma. Careful calibration of the TS system is essential to accurate data interpretation and error analysis; in addition to explaining the basic physics behind MST operation and the TS diagnostic, this poster describes the calibration techniques used to establish the gain and noise level of each APD, the spectral transmission of each polychromator, and the error bars associated with TS measurements.

TOKENIZATION AND REPRESENTATION

Ketchum Armena, and Melissa Tedrowe (Mentor), English

The media is a model of our status quo and has hypnotized America in believing that everything shown on television is how the world is. This project examines the media's news and advertising, primarily in on-campus publications at the University of Wisconsin–Madison. The project analyzes when marginalized groups are included within news editorials. Furthermore, it questions whether the media is tokenizing (i.e., defining an individual or group by stereotypical distinctions that entail categorizing subgroups) or making judgments in representation. I will gather on-campus newspapers, while paying close attention to other statewide publications, comparing coverage of marginalized groups. As the study gets underway, I plan to make a dominant, but documented statement of how the media can convey a mask of discrimination in its coverage.

TRAFFIC MODELING AND SIMULATION

Lee Xiong, and David Noyce (Mentor),
Civil & Environmental Engineering

Transportation has been evidence throughout history, from the earliest of time with foot transportation all the way to modern transportation of aircrafts and vehicles. Vehicles have been a key transportation of humans during the 21st century. With many vehicles on the road, traveling without any type of controls can be hectic; therefore, controls such as stop signals are enforce. The goal of this project is to maximize the flow of traffic by controlling the stop signals. Using computer modeling and simulation software for traffic flows, we are able to determine and maximize the flow of traffic based on the data that are gathered.

TRICARBALLYLATE CATABOLISM IN SALMONELLA ENTERICA

Lisa Watanabe, and Jorge Escalante-Semerena (Mentor), Bacteriology

Tricarballylate (Tcb) is an organic acid structurally similar to citric acid, a Krebs cycle intermediate. Tcb is produced in the rumen by microorganisms that reduce trans-aconitic acid. Tcb poses a serious problem to the ruminant since it chelates magnesium ions and the Tcb-magnesium complex is excreted by the animal. This Tcb-induced magnesium deficiency leads to grass tetany in ruminant animals. *Salmonella enterica* can use Tcb as a carbon and energy source. *Salmonella enterica* contains a tricarballylate utilization (*tcu*) operon consisting of *tcuABC*, which is dedicated to the catabolism of this compound. A regulator gene, *tcuR*, is located immediately 5' to the *tcuABC* operon. Genetic evidence suggests that *TcuR* is a positive regulator. We hypothesize that Tcb is the inducer of this regulator.

UNDERSTANDING CYTOTOXIC T-CELL EFFICACY AGAINST AIDS VIRUSES

Sean Spencer, and David Watkins (Mentor),
Pathology and Laboratory Medicine

Each day 14,000 people become infected with HIV, making the development of an effective HIV vaccine one of the world's top health priorities. David Watkins' laboratory is attempting to develop a vaccine that elicits cellular immune responses using the simian immunodeficiency virus (SIV) infected rhesus macaque model. Current evidence suggests that cytotoxic T-lymphocytes (CTL) play an important role in controlling HIV/SIV. However, our understanding of CTL efficacy is limited. To address this problem, we employed a viral suppression assay that quantifies the ability of antigen-specific CTL populations to control viral replication. Using this assay, we compared the antiviral efficacy of two CTL responses, a Tat- and Gag-specific CTL. We found that Tat-specific CTL were at least 18-fold more effective at suppressing viral replication. With further investigation, we will identify those CTL most efficacious against SIV. This information may impact the design of future HIV vaccines.

UNDERSTANDING THE BIOLOGICAL FUNCTION OF COACTIVATED ASSOCIATED METHYLTRANSFERASE (CARM1) IN CANCER

SiangYun Ang, and Wei Xu (Mentor), Oncology

Coactivated associated methyltransferase 1 (CARM1), an enzyme that regulates cellular processes via methylation of histones and other proteins, can inhibit growth of estrogen-responsive breast cancer cells when enzyme expression is increased. This project focuses on identifying if cleavage and polyadenylation specific factor 6 (CPSF6) is a novel substrate of CARM1. Using bacteria, the mammalian protein CPSF6 was expressed and purified. CPSF6 was then shown to be methylated by CARM1 through in vitro methylation assays. Further research involves locating specific sites in CPSF6 that binds to CARM1 and also examining in vitro and in vivo interactions between CARM1 and CPSF6. As currently CARM1 is not well understood, this research will provide insight into the mechanism of CARM1 in estrogen receptor regulation and its role in cancer.

UNDERSTANDING THE THIRD PERSON PERCEPTION OF MEDIA EFFECTS

Aixa Velez, and Douglas McLeod (Mentor),
Journalism and Mass Communication

This research explores the role that ego defense mechanisms play in assessments of media effects on self and other. It addresses the question; do we think we are less affected than others as a strategy of ego enhancement? To address this question we employ an online experiment. We measure the extent to which participants employ various ego defense strategies (e.g., denial, omnipotence) and ask questions that require students to estimate the effects of a violent videogame on self and others. Additionally, the experiment includes conditions that manipulate whether participants are presented with an ego threat and whether this has an effect on their judgments of perceived videogame effects. Through this we will test the extent to which an ego threat or enhancement drives third person perceptions.

UNITED STATES PRISONERS OF WAR IN VIETNAM AND STEREOTYPES

Lance Vest, and Craig Werner (Mentor), Afro-American Studies

The purpose of this research is to see how United States' Prisoners Of War (POWs) were treated in Vietnam and how this affected their stereotypes of the Vietnamese. The goal is to determine whether or not POWs gain more respect for their enemy after being held captive. Information has been gathered by examining personal accounts of soldiers who were and were not POWs. The projected results are that POWs have fewer stereotypes than non-POWs do. This research is important because it helps us understand how stereotypes are formed and what effect they have on the lives of the soldiers. This will help us to better understand POW of other wars and to help prevent new stereotypes from forming in war.

UNIVERSITY DISASTER RELIEF PROGRAM

Kelly Dwyer, and Richard Brooks (Mentor),
Professional Development and Applied Studies

This program is designed to offer students at the University of Wisconsin–Madison the opportunity to participate in relief efforts for recent natural disasters. The students would be responsible for a number of relief efforts including on-campus fundraising and monitoring students, faculty, and family members affected by disasters. The program will also give students a chance to travel to disaster sites and directly assist in the relief effort. The final goal of this project is to create a student organization that can act as a campus headquarters for disaster relief, and allow students the chance to actively participate in the relief effort.

USING LIFE HISTORIES OF AT-RISK TEACHERS TO UNCOVER SIMILAR AND EFFECTIVE BACKGROUNDS AND TECHNIQUES

Lindsay Ludeman, and Audrey Trainor (Mentor),
Rehabilitative Psychology

Every year, millions of high school students will either risk failing or even drop out of traditional high schools nationwide. Many of these same students labeled “at risk” fail on account of their balancing schoolwork family dysfunction, teenage pregnancies, poverty, or more. Nonetheless, these same students oftentimes succeed and achieve more in life than thought possible through alternative school programs, which offer a more applicable approach to education. Our research is based on an accumulation of life histories given by at-risk educators voted to be the most successful in reaching their students. In this way, we hope to uncover the past experiences and approaches needed to make the powerful impact needed in some of America’s most troubled youth.

VALIDATION OF NON-INVASIVE TISSUE DISTRIBUTION BY MICRO PET SCANNING IN MICE

Angelina Orozco, and Jamey Weichert (Mentor), Radiology

PURPOSE: Evaluate microPET as a sensitive and accurate replacement for traditional tissue distribution (TD) studies. A-549 human lung carcinoma model in SCID mice was utilized. The PET agent 124I-NM404 was used to selectively image tumor cells. With this radiopharmaceutical we are able to generate microPET images as well as collect ex-vivo biodistribution data. **PROCEDURE:** Injected approximately $10E6$ A-549 cells subcutaneously in to the flank of 16 anesthetized SCID mice. The tumors were allowed to grow for 21 days; twelve mice were then randomized into four groups of three tumor-bearing mice for injection with 124I-NM404. They were then imaged with microPET and microCT and finally tissue distribution was performed. Twelve tissues were collected from each animal. Lastly we determined isotope content in dose calibrator using the 124I window. TD values were calculated as %inj.dose/g, %inj.dose/organ and direct comparison to quantitative data collected on the microPET.

VEGETATION CHANGE AT CHEROKEE FEN FOLLOWING A RESTORATION EFFORT

Keiko Ishida, Tomotsugu Ishida, and Quentin Carpenter (Mentor),
Institute for Environmental Studies

Hydrologic and vegetation restoration at Cherokee Marsh, Madison, Wisconsin enters its second year. Drainage ditches installed in the 1960's, which caused significant hydrologic and vegetation alteration, were filled during the winter of 2005. Research during the fall of 2005 documented the original condition and the degradation using a series of air photos. During the Spring Session, the investigators propose to collect and organize all existing vegetation and hydrology data concerning the restoration area and its immediate environs. These will include vegetation surveys from the 1970's, 1992, 2000 and 2001 and hydrology studies from 1998 and 2001. In addition, we will begin field work, re-establishing three 100m by 50m plots from 2000 and 2001 and developing a species list in preparation for a full re-survey of these plots in August.

VIETNAM VETERANS

Carlos Martinez, and Craig Werner (Mentor), Liberal Studies

Vietnam: Through the eyes of the soldiers The goal of this research is to explore the lives of the American soldiers in the Vietnam War, focusing on how violence affected them and their relationships with the Vietnamese while fighting in the war. The purpose is to determine what factors of the war impacted the soldiers the most, and how those factors impacted the relationships they formed with another culture. Sources such as oral histories and specific battles during the war will better depict the experiences of the soldiers in Vietnam. This research is important to me because it will help me to better understand the lives of the soldiers and the memories of the Vietnam veterans that are rarely shared.

VILLAGE HEALTH PROJECT: PROVIDING CLEAN DRINKING WATER IN RURAL UGANDA

Kaitlyn Duckert, Jenna Klink, Callie O'Neil,
Abby Stepaniak, and John Ferrick (Mentor), International Programs

With funding from the Wisconsin Idea Fellowship through the Morgridge Center, we have successfully created a 501(c)3 nonprofit organization, Village Health Project, with efforts focused on water sanitation in rural Uganda. With the building of four water tanks in rural communities, we have successfully implemented a service-learning component to the existing CALS study abroad winter break program in Uganda, Africa. Students worked hands-on with community members and building teams to construct the rainwater collection tanks, which now provide clean and disease-free water. Tests were completed in the villages showing the need for pathogen-free water and for education based around water sanitation. The Wisconsin Idea Fellowship has allowed us to provide for them what we take for granted every day: access to clean, safe water.

VOICES OF WOMEN IN A GLOBALIZING INDIA: FILM PROJECT

Ashok Kumar, and Joseph Elder (Mentor), Sociology

My project is basically the construction of an ethnographic documentary that narrates the stories of women in an increasingly globalizing India. The project, a collaborative effort among the International Human Development and Upliftment Academy (IHDUA), Professor Joseph Elder, the Morgridge Center for Public Service's, and myself, will foster awareness within the UW–Madison community and help create an international service program to IHDUA projects in India. I spent three months within India documenting tribal, rural, and urban peoples and filming a wide array of issues that affect women. The project aim was to re-examine the popular notion that globalization benefits everyone in India through an investigation on the possible negative effects of 'Americanization' on Indian women. The final goal of the project is the creation of a Foreign Service IHDUA program for students, which would provide UW students with an opportunity to fulfill their own future projects in India.

WHAT QUESTIONS ARE PATIENTS ASKING DURING MEDICAL VISITS?

Zachary Brazgel, and Betty Chewning (Mentor), Pharmacy

The primary purpose of this research is to determine any correlation between the amount of questions patients asks and the length of medical visits. The secondary purpose is to develop a better understanding of what types of questions patients ask and what precedes them. Data is coded with a tool specified for time, patient questions, open or closed questions, and what precedes the question. An existing dataset of audio taped patient-physician encounters is being coded. The visits are between patients with rheumatoid arthritis and their rheumatologists. The product of this research is twofold; a typology of patient questions will be developed and quantitative analysis will examine patterns of what causes questions, the questions themselves, and the length of discussion of the question.

WISCONSIN SMALL TELESCOPE ARRAY FOR RADIOWAVE (W-STAR): COMPARING INTERFEROMETRY TECHNIQUES

Bridget Diem, Kristen Jones, Allison Noble, and Peter Timbie (Mentor),
Physics

We propose to build three small radio telescopes, based on the designs of MIT's Haystack Observatory, in order to develop and test new techniques for interferometry. An interferometer is an array of telescopes that combines signals to generate a higher resolution image of the sky than a single, smaller antenna can create by itself. We will build and compare an "adding interferometer" with a "multiplying interferometer." The telescopes will also be used to investigate and map the 21-centimeter line produced by neutral hydrogen (HI) in the galaxy. Furthermore, we propose to create an outreach program in which the academic community will have access to the telescopes to elicit scientific interest amongst undergraduate students.

WOMEN IN WISCONSIN GOVERNMENT

Sarah Fortin, and Susan Paddock (Mentor),
Professional Development and Applied Studies

Women in Wisconsin government is a study of women who hold local and county elected positions in the state of Wisconsin. Through a survey we hope to find what issues these women in office are concerned with. We also hope to find if these women have faced any obstacles during their race for office as well as during their term in office. This is part of a longitudinal study, so we hope to compare results from this survey with those collected in 1990, as well as with data available for men in similar positions. The goal of this study is to bring light to some of the obstacles that women in government must face and to aid associations in promoting women's involvement in elected government.

WOMEN'S RIGHTS LEGISLATION IN AFRICA: HAVE WOMEN'S MOVEMENTS BEEN EFFECTIVE?

Emma Condon, and Aili Tripp (Mentor),
Political Science and Women's Studies

The aim of this project is to find statistical support for the role of women's movements in the enactment of women's rights legislation in Africa. The project has found that the passage of more recent legislation, such as FGM bans or quota systems for the legislature, has been correlated with a strong women's movement in the country where the legislation is passed. Furthermore, the project finds that changes in modern and more distant institutions are easier to push through than those that directly challenge local power structures and widely practiced traditional culture. The final product will be used to contribute to a book about African women's movements.

WORKERS' RIGHTS: LEARNING THE PROBLEMS, FINDING THE SOLUTIONS

Lindsay Enters, Rebecca Mergen, and Gerry Campbell (Mentor),
Agricultural and Applied Economics

This semester, we are volunteering at the Interfaith Coalition for Worker Justice (ICWJ) in the Workers' Rights Center (WRC); a bilingual organization that works with issues and campaigns to improve wages, benefits, and working conditions for area workers. We will be engaged in a variety of projects in different capacities to improve the labor rights of Madison's low-wage workers. The magnitude of this issue mandates that we learn labor law, act as advocates, and participate in macro-campaigns. Our goal is to assist in the realization of ICWJ's mission, by creating an organized model for new advocates to be trained. Rebecca will be focusing on compiling a Spanish-English vocabulary booklet as a helpful resource to new volunteers with useful words and phrases for this type of worker advocacy. Lindsay will be working on small projects throughout the WRC, helping the director to become more organized and creating a set role for English-only speakers within this organization.

YOUTH ENGAGED THROUGH LANGUAGE PROJECT: YELP

Katrina Flores, and YongPing Zhu (Mentor),
East Asian Languages and Literature

YELP provides an opportunity for Madison youth (5–11 years old) to become educationally engaged through language acquisition and cultural programming. This goal is reached by partnering UW–Madison students studying Chinese with Madison community youth enrolled in the Atwood Afterschool Program. YELP students also have the opportunity to participate in a state wide Chinese Speech Contest to demonstrate and apply their learned skills. The 2005–2006 YELP programming year has served as a basis for research in developing a 3-credit service-learning course counting toward a Chinese Major. YELP makes a case for why youth can and should build their language acquisitions skills at an earlier age. Furthermore, YELP challenges the current language offerings youth have access to and why Chinese should be taught more widely.

