FIFTH ANNUAL

Celebration of Academic Excellence

Tuesday, April 7, 2009
Center for the Arts
Student
Lauren Insalaco

Major
Architecture

Research Mentor
Professor Annette LeCuyer

Title
City + Life

Abstract
Eating is an essential aspect of life, for both nourishment and social interaction. A loose aggregation of work/live residential units allows for double-height glazed dining spaces to project into the street, while private bedrooms are pushed back, creating shared terraces. The terraces function as summer kitchens and outdoor dining spaces. Oversized fireplaces and full-height glazed doors connect the inside kitchen with the outside terrace. The commercial grade kitchens also function as the main living/social space. The use of site cast concrete with radiant in-floor heating and cooling, tempers the building, reducing HVAC loads. Large fireplaces provide additional heat to the units, reducing the use of fossil fuels. Operable vertical fins on the double height glazing provide solar shading. A work/live community helps keep jobs downtown, therefore cutting down on work related traffic, and promoting high-efficiency living. All of these design considerations reduces the overall embodied energy of the building.

Student
Dana Lukaszewski

Major
Environmental Design

Research Mentor
Alex Bitterman, Ph.D

Title
Corporate Design: Information and Attention

Abstract
Artspace was created in Minneapolis in 1979 so that artists living around the country could have an affordable place to live while they work on their art. Artspace also gives the artists space to work on their art in the same building that they live in. Artspace has become increasingly popular since it originated and is one of the leading non-profit real estate developers in the country. The two main goals of Artspace are the historic preservation of unused older buildings in a community and providing affordable homes for local artists. Artspace typically will re-use an older building, like Buffalo’s Electric Vehicle Building, in addition to building new structures such as the Artspace lofts located behind the Buffalo Electric Vehicle Building. In addition to preserving historic buildings Artspace also uses green building techniques which lessen the environmental impact of the building. Artspace Buffalo Lofts opened its doors in the summer of 2007.

Student
Noellan Niespodzinski

Major
Architecture

Research Mentor
Omar Khan, M. Arch.

Title
Gravity Screen Project

Abstract
North Park Theater is located in Buffalo on Hertel Avenue in the middle of resident area along with many restaurants, shops and bars. It is part of Dipson Theater Inc. Once it was Shea’s theater, but later on
it was acquired by Dipson Theater Inc. The theater was designed by architect Henry L. Spann in 1920, it falls into neo-classical style of architecture. Spann designed and built many theaters in Buffalo area. However only North Park Theater is the current existing Spann’s theater in Buffalo. The interior of the theater contains wooden entry door and marble entryway. The theater shows mainstream, semi mainstream, independent and foreign films.

**Student**
Alex Wallach

**Major**
Environmental Design

**Research Mentor**
Alex Bitterman, Ph. D.

**Title**
Corporate Design: Information and Attention

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**Student**
Takako Yoshikuni

**Major**
Architecture

**Research Mentor**
Sergio López-Piñeiro, M.Arch.

**Title**
A New House of Communication for the American Dream

**Abstract**
Before the communication devices became portable, the physical boundaries of houses for single nuclear families in America organized the communication ties among the members of the family. Communication devices such as television, telephone, and computer were the centers of communication among family members in their homes. However, as communication devices have become more portable, the ties between family members and their houses have tended to become less strong. Nowadays, communication within family members tends not to occur in the same space where it used to happen. New communication devices follow where each member of the families goes. This project seeks to investigate a new physical boundary for houses that explore these new communication ties within family members.

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**Title**
The tRNA Modification Complex Elongator Regulates the Cdc42-Dependent MAPK Pathway that Controls Filamentous Growth in Yeast

**Abstract**
Signal transduction pathways control multiple aspects of cellular behavior, including global changes to the cell cycle, cell polarity, and gene expression. In the budding yeast Saccharomyces cerevisiae, the MAPK pathway that controls filamentous growth induces a dimorphic foraging response under nutrient-limiting conditions. How nutritional cues feed into MAPK activation remains an open question. Here we report a functional connection between the elongator tRNA modification complex (ELP genes) and activity of the filamentous growth pathway. Elongator was required for filamentous growth pathway signaling, and elp mutants were defective for invasive growth, cell polarization, and MAPK-dependent mat formation. Genetic epistasis analysis showed that elongator functions at the level of Msb2 receptor, which led to the finding that elongator regulates starvation-dependent expression of the MSB2 gene. Because protein translation provides a rough metric of cellular nutritional status, elongator may convey nutritional information to the filamentous growth pathway at the level of MSB2 expression.

**Student**
Timothy Baer

**Major**
Psychology

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= University Honors Student  
= CURCA Funded Project
Title
Stability and Components of Self-Esteem: Underlying Motivation

Abstract
Research is beginning to show that high self-esteem (HSE) may not always be as beneficial as people typically believe. For example, HSE has been associated with increased levels of aggression and defensiveness. One explanation for this is that different dimensions of self-esteem, beyond the extent to which it is high or low, may be important. Research investigating self-esteem stability found evidence that those with unstable HSE possess an underlying self-doubt not typically seen in those with stable HSE. To further investigate this difference, cardiovascular responses were assessed to examine underlying motivational states (1) after participants succeed versus failed; and (2) in the context of a test that could identify only people with either extremely high or low ability. It was expected that those with unstable HSE would experience a negative motivational state (threat) following failure, but only when it was possible to demonstrate one’s exceptionally high ability. This should occur because people with unstable HSE are concerned with being exceptional; previous failure should trigger underlying self-doubt focused, in particular, on the fear of failing to be exceptional. The expected results will be important for understanding when and why HSE can lead to undesirable reactions to events.

Student
Farda Barandeh

Major
Biomedical Science

Research Mentor
Shermali Gunawardena

Title
A POTENTIAL DRUG DELIVERY SYSTEM in Drosophila Larvae

Abstract
To examine whether nanoparticles could be used as a potential drug delivery system for neurodegenerative diseases such as Alzheimer’s disease, it is appropriate to know the effect of nanoparticles on the neuronal tissues such as cell bodies, axons and synapses and to evaluate its toxicity to such tissues. We tested three questions: 1) The effect of nanoparticles on neuronal transport, 2) if nanoparticles caused neuronal death and 3) how nanoparticles affected synapses. These questions were tested in vivo in Drosophila larvae. Using antibodies against vesicles, my results showed that nanoparticle application does not cause transport problems since there were no organelle blockages in the axons. Using the TUNEL assay I examined cell death in larval brains and found that nanoparticles did not cause any cell death in the neurons. To examine the effects of nanoparticles on the synapses I looked at the Neuromuscular Junctions between muscles 6 and 7 using antibodies against pre-synapses and post synapses. The results showed that nanoparticle treatment along with the high temperature had some effect on the muscles and the NMJ. The synaptic butons, which are usually organized, with a specific size, looked unorganized and large. Currently, I am in the process of using antibodies against ER and Golgi membrane proteins to determine if nanoparticles penetrate into these organelles and whether or not these proteins along with nanoparticles are subsequently transported throughout the cell.

Student
Danielle Barbiero

Major
Animal Behavior Research

Research Mentor
Dr. Eduardo Mercado

Title
Humpback Whale Research conducted in Puerto Rico

Abstract
The purpose of the research conducted in Rincon, Puerto Rico is to gather information on song use by humpback whales and to determine the communicative function in terms of its use in species identification and localization (Schneider & Banks, 2006). Due to the importance of song use by humpback whales, it is critical to understand how it is affected by noise pollution, caused by anthropogenic sources such as boats (Schneider & Banks, 2006). Hydrophones are used to locate and record underwater sound, including songs produced by Humpback whales (Mercado et al.). From this research, a community outreach program was developed to raise public awareness about the plight of the humpback whale. The goal of this program is to enlighten the community about the methods used and data collected relevant to this research. This will be accomplished by traveling to local schools and encouraging the students to participate in a science lab. The students will be able to construct their own hydrophone (underwater microphone) for practical use and to learn about noise in the ocean. The ultimate goal of this project is to inform the public of the effects of noise pollution in the ocean and how it affects song use by the whales.

Students
Kevin Bryant, Lauren Kneussle, Ciara Cregan, Lisa Klispie, Winnie Lei, Jane Park

Research Mentor
Dr. Wesley T. Carter

Title
A Survey of Racial Attitudes between Four Groups of Students: Black, White, Latino, and Asian at the University at Buffalo

Abstract
The purpose of this survey will be to identify contemporary attitudes regarding race and race relations in the perceptions and lives of four diverse groups of students: black, white, Latino, and Asian. The project will establish a baseline for
the study of a broader population as well as provide a sampling to ascertain attitude changes over time. The PI will be comparing the results of the surveys with surveys that he hopes to administer to similar groups in the next two academic years. Taped interviews will also be conducted and will serve as instruments of comparison between the students’ verbal responses and the expressions of opinion derived from the surveys.

Student
Elizabeth Cappadonia
Major
Chemistry
Research Mentors
George H. Nancollas, Zachary Henneman

Title
Specific Conductance Measurements of the Initial Stages of Calcium-Phosphate Nucleation

Abstract
Measurement of electrical conductance of an electrolyte solution can be exploited to evaluate ionic interactions that occur during crystal nucleation. As ion pairs are formed, the specific conductance of a solution changes as charge carrying species interact. Data collected in our constant composition (CC) experiments has allowed us to monitor the stability of ion clusters preceding homogeneous nucleation of calcium phosphate (Ca-P) crystallites in vitro. In conjunction with CC kinetic data and electron microscopy, this highly sensitive conductivity technique can be used to examine the initial stages of bone and tooth formation. A more thorough understanding of the biomineralization mechanisms for bone and teeth may eventually lead to synthetic methods of bones and tooth repair in vivo.

Student
Jane Wai Chan Chan

Abstract
Northeastern Costa Rica, Dec 2008 through Jan 2009 - El Zota Biological Field Station was the site of my Great Green Macaw (Ara ambiguus) research. I tracked, observed, and recorded the behaviors of these endangered birds. The field station is situated in one of the most bio-diverse regions of Central America although the future of macaws and other wildlife looks grim due to banana and pineapple plantations.

The experience was invaluable for macaw research as well as networking, and for future job opportunities. This research was significant to my Animal Behavior major because I learned many things through field exercises, seminars, lectures, and independent research. Currently I am conducting my own research at the Buffalo zoo, under the advisement of Dr. Carol Berman, studying the effects of scent enrichment on snow leopards, Uncia uncia. At this time Dr. Micheal L. Dent and I are writing a paper in regards to my experiment on zebra finch preference in relation to environmental enrichment with hopes of the paper being accepted to a major scientific journal.

Student
Jeffrey Dorfman
Major
BRA Theater Design/ Technology
Research Mentor
Associate Professor Lynne Koscielniak

Title
Technological Innovations on a Regional, National, and International Stage

Abstract
My attendance at the United States Institute for Theater Technology National Conference will yield the following results:

A 3-D visualization of a scenic design element from “The Mystery of Edwin Drood,” the musical that I am currently
designing for the Department of Theater & Dance. I have yet to integrate 3 dimensional drafting methods into theater design work as a tool for communicating with directors. Meeting with the developers of the computer aided design software, Vectorworks, will allow me learn details of the program not available in manuals.

A presentation of findings from classes pertaining to plagiarism in our digital age. Visual research is the basis for primary information for theatrical designers. As images have become more available on the internet, responsible use of these images is a large concern.

Student
Andrew Fenster

Major
Theatre

Research Mentor
Associate Professor Lynne Koscielniak

Title
USITT Conference Research of Advanced Lighting Technologies and Lighting Design

Abstract
The USITT Conference is a time for some of the greatest minds in technical theatre to come together and share their new ideas and technologies with the future generation of designers and technicians. At this Conference I will be exploring new lighting technologies such as the newest form of lighting control and communication E-Net; and comparing it to the other forms of control DMX and EDMX. I will also be looking into the new forms of intelligent and LED lighting instruments, and finding out how a modern age designer can incorporate these new technologies into their work. The knowledge gained on these new and ground breaking technologies will then be brought back to the Department of Theatre and Dance where we will incorporate them into the work that we do here within the budget and limitations of the University.

Student
Kathleen Elizabeth Gilliland

Major
BFA Design and Technology

Research Mentor
Associate Professor Lynne Koscielniak

Title
Technological Innovations on a Regional, National, and International Stage

Abstract
The United States Institute for Theatre Technology Conference provides opportunity to further investigate the interdisciplinary relationship between architectural and theatrical lighting design, explore the ways in which theatrical lighting equipment can be used to its fullest potential in production, and learn how simulation software can improve the design process. My research includes a proposed a lighting inventory that can cross over industries, one that works in traditional venues, found spaces and civic centers. Sharing this inventory with my fellow students will hopefully lead to awareness, understanding, and the integration of these technologies in department and regional productions. Having begun research in WYSIWYG technology, LD Assistant, and ESP Vision, I can decipher which software could be best integrated into our work. Compiling my new expanded understanding of lighting instruments, software, and design I will present the link between architectural and theatrical lighting. This will be my first step towards an interdisciplinary project in architecture and design to be completed by my final semester here at UB.

Student
Amy L. Hardy

Major
Linguistics, French Language & Literature, German Language & Literature

Research Mentor
Dr. Jeri Jaeger, Dr. Jeanette Ludwig

Title
The Production and Perception of Genderlect

Abstract
“Genderlect” can be defined as the different variations of language that men and women speak. In the experiment in The Production and Perception of Genderlect, I will be looking at characteristics of “male” vs. “female” speech in American English. This includes fifteen groups of dyad conversations: five male/male (MM), five female/female (FF) and five male/
Female (MF). Each group is given three neutral topics to discuss for three minutes each, believing they are discussing their opinions of Buffalo and SUNY Buffalo. Their conversations are recorded and later analyzed by the principal investigator for linguistic markers of Genderlect, including: interruptions, tag-questions, hedges, silences, etc. The participants then fill out a questionnaire with questions asking about different gender speech patterns (without stating it is related to gender) to evaluate their conversation. This demonstrates their personal perception of the conversation and possibly of how the speaker perceives gender related speech acts. The answers on the questionnaire are then compared to my analysis of the conversation. A group of ten males and ten females then listen to minute 2 of each conversation and fill out a separate questionnaire asking directed questions about how they perceive the conversations (and genderlect). Preliminary results show that women use more hedges and tag questions than men, but both sexes interrupt equally as often. It is not men, but the dominant speaker (Alpha) who speaks more during the conversation.

Student  
Aelish Hart  
Major  
Linguistics and Anthropology  
Research Mentor  
Jeri Jaeger  

Title  
Stress and Vowel Length in Finnish  

Abstract  
This project aims to determine the relationship between lexical stress and vowel length in Finnish. In Finnish, phonemic long and short vowels occur both in stressed and unstressed syllables, stress being consistently on the first syllable of the word. Since stress is usually perceived through vowel length, this leads to the question, “How do stress and phonemic vowel length distinctions interact in Finnish?” To answer this, I examine the distinctions between long and short vowels in both stressed and unstressed syllables to reveal whether the length distinctions are maintained in both cases. Then, I will attempt to answer the sub-question, “How is stress determined, if not only by vowel length?” As pitch is the next most likely candidate, I measure the pitch contours of stressed and unstressed syllables to determine if this is the quality which is used to determine stress, or if, perhaps, it is a combination of factors.

Student  
Marlana J. Howard  
Major  
Psychology  
Research Mentor  
Dr. Sarah-Jeanne Salvy  

Title  
The Presence of Friends Increases Food Intake in Youth  

Abstract  
Background. Friendship may be uniquely relevant and influential to youth’s eating behavior. Objective. This study examined how overweight and non-overweight youth adjust their level of eating as a function of their familiarity with their eating partner. Design. Thirty-two overweight and 40 non-overweight youth had the opportunity to play and eat with a friend or with an unfamiliar peer. The dependent variables of interest were the amount of nutrient-dense and energy-dense foods children consumed and their total energy intake. Results. Results of the random regression models indicate that participants eating with a friend had a greater total energy intake (p<.005) as well as greater intake from energy-dense (p<.01) and nutrient-dense (p<.01) foods than participants eating with an unfamiliar peer. Furthermore, overweight participants eating with an overweight partner (friend or unfamiliar peer) had a greater total energy intake (p<.01), consumed more nutrient-dense (p<.05) and more energy-dense (p<.05) food than overweight participants eating with a non-overweight eating partner.

Conclusions. These results extend previous research in suggesting that the effect of the partners’ weight statuses may add to the facilitative effect of familiarity (friends eat more than unfamiliar peers) and result in greater energy intake in overweight youth and their friends.

Student  
Rebekah Hurley  
Major  
Psychology  
Research Mentor  
Mark D. Seery, Ph. D.  

Title  
Self-Expansion and the Incorporation of Partners’ Resources  

Abstract  
Self-expansion refers to when people adopt the qualities of close others (e.g., romantic partners) as their own. The current study investigated if self-expansion can affect people’s experience of possessing resources to successfully perform a task. Participants were selected based on reporting either high or low incorporation of their romantic partners into their senses of self. All participants further reported having poor math skills but partners with high math skills. In subsequent individual laboratory sessions, participants wrote about their partners and then completed a math test while their physiological responses were recorded. I predicted that participants who incorporated their partners into themselves to a high degree would evaluate possessing their partners’ resources to a high degree would evaluate possessing their partners’ resources while performing a relevant task, resulting in a more positive physiological and psychological state than for people who incorporated their partners to a low degree. These findings would provide important new insight into the range of ways in which people can be affected by close relationships.
Students
Monisha Khanna & Emily DiBlasi

Major
Biological Sciences

Research Mentor
Katharina Dittmar De La Cruz

Title
The time it takes to adapt to caves - An example from Astyanax Mexicanus

Abstract
In evolutionary studies of cave adaptation, the fish Astyanax mexicanus has become a model system. The presence of both surface and cave-adapted populations also makes A. mexicanus useful for investigating the timing of acquiring the cave adapted form, which is characterized by reduced or absent eyes, and a loss of pigmentation. In this study we use mitochondrial and nuclear sequence data to estimate the divergence times of some cave populations of Astyanax mexicanus from Mexico. A combination of population-level analyses using molecular clock methods and broad phylogenetic analyses using fossil calibrations indicates that acquisition of the troglomorphic form in the cave populations was younger than 2.2–5.2 Ma, which is faster than previously anticipated.

Students
Ewelina Kotowska & Peter Gorman

Major
Psychology

Research Mentor
Dr. Alexis Thompson

Title
Modeling Cocaine Withdrawal-Induced Anxiety in Rats

Abstract
Cocaine exposure induces neural and behavioral adaptations that contribute to heightened anxiety during periods of cocaine abstinence. An animal model of cocaine withdrawal-induced anxiety would allow researchers to measure the effects of different therapeutic treatments for the prevention of anxiety-induced relapse in humans. We used two common paradigms for measuring anxiety in rats — defensive burying task and social interaction task — to determine the effects of chronic cocaine dependence and subsequent withdrawal on anxiety. Rats were assigned to one of three treatment conditions: 1) cocaine withdrawal (3 weeks of daily injections of cocaine and 3 days of no drug exposure), 2) cocaine dependence (3 weeks of daily cocaine injections), or 3) saline (3 weeks of daily vehicle injections). Dependent measures (social contact [SC] and defensive burying [PB]) were collected before (PB only), immediately after, and one month after treatment. Preliminary results suggest these behavioral paradigms can model cocaine withdrawal-induced anxiety.

Student
Michael Lisieski

Major
Psychology/ Pharmacology & Toxicology

Research Mentor
Dr. Susan Udin

Title
Development of Isthmotectal Axons in Xenopus laevis

Abstract
Florescent beads are injected into the optic tectum of Xenopus laevis tadpoles at various stages of development. These beads then travel retrogradely through axons that terminate in the optic tectum. The brains are sectioned and the nucleus isthmi is examined for the presence of fluorescent beads, the presence of which indicates that an isthmotectal projection is present. In this way, the stage of development at which isthmotectal projections first appear can be determined.

Student
Yingrui Liu

Major
Mathematics

Δ = University Honors Student  Ă = CURCA Funded Project
Abstract
We present an efficient method for simulating pulse propagation in fiber optics telecommunication systems with a large number of frequency channels. Considering optical solitons as an example, we obtain a system of coupled ordinary differential equations (ODEs) for the pulse parameters, which takes into account perturbations due to physical processes in the fiber (e.g. Raman scattering), collisions between pulses from different frequency channels, as well as bit-pattern randomness. We numerically solve the system for a large number of bit-pattern samples. The results of the simulations are analyzed by calculating the probability density functions of pulse parameters and system performance is evaluated by computing the bit-error-rate.

Title
Particle Simulations for Pulse Propagation in Optical Fiber Telecommunication Systems

Student
Robert J. Matthews

Major
Political Science

Research Mentor
Dr. Kristen Campbell

Title
The Budgetary Effects of Cooperation & Competition in Space Policy from 1960-2000

Abstract
This paper examines NASA’s budget from 1960-2000 using the Policy Agendas data (Baumgartner and Jones 2004). We attempt to explain periods of budgetary incrementalism v. drastic change based on cooperation or conflict in the international space race. Abstract: Previous scholarly work on US budget policy has identified two distinctive characteristics of policy processes: Budgetary or bureaucratic inertia and drastic adoption of changes from outside policy processes (Thomas 1999). Incremental approaches (Stromberg 1970; Crecine 1971) argue that budgetary processes are characterized by stability and gradual, incremental changes. However, punctuated-equilibrium (Baumgartner 1993; True et. al. 2006) suggests that policy processes are characterized by both stasis and crisis. In other words, the US budget process remains stable most of the time, but significant alteration to a policy occurs when there are external shocks to the system. In an attempt to address this question, we apply these competing theoretical perspectives to the NASA budget process and examine how international environments, particularly international competition and instability vs. international cooperation and stability, shape the budget process. We rely on congressional hearing and budgetary data from the Policy Agendas project (Baumgartner and Jones 2004) for the dependent variable and content analysis of space related stories in the New York Times for a measure of international cooperation and conflict between 1960-2000.

Student
Yekaterina (Katya) Merkulova

Major
Medicinal Chemistry

Research Mentor
Kenneth J. Takeuchi

Title
The Synthesis & Characterization of Magnetite: The Use of a Syringe Pump

Abstract
Magnetite is an unusual ionic material, because it displays magnetic properties, and is a common iron oxide in the environment and in biological organism. The synthesis of magnetite is a topic of much recent research, because in addition to its presence in nature, it also has applications and potential applications in industry. This poster presentation will focus on the use of a syringe pump in the laboratory, and its possible application towards the precipitation of magnetite.
may be most beneficial for avoidant and non-avoidant individuals during times of need.

Student
Lisa Ann Nelson

Major
Linguistics, Language in Cognition

Research Mentor
Dr. Jeri Jaeger

Title
Language Acquisition Post-Hemispherectomy: A Literature Review

Abstract
Neuroplasticity refers to the brain’s ability to reorganize critical structures after environmental changes. Since each hemisphere is predisposed to specific types of functions, a useful method for studying plasticity is through hemispherectomy, the complete removal of the left or right hemisphere. In this paper I review studies of hemispherectomy and thus far have found that there is a complex interaction between the ability for the right hemisphere to learn various aspects of language and the age of hemispherectomy, stage of language development, handedness, and etiology of disease. Furthermore, the right hemisphere can learn most of the essential language functions but not all; in particular, there are problems concerning the complete development of syntax. This is because of genetically determined differences between the right and left hemisphere, which predispose the left hemisphere to predominantly process and represent language. In the absence of the left hemisphere these structures cannot be fully acquired.

Student
Magdalena Ostrowski

Major
Psychology

Research Mentor
Mark D. Seery, Ph. D.

Title
Physiological Responses to the Media

Abstract
People in Western society are constantly bombarded by the media, which has a large impact on thoughts, feelings, and behaviors (i.e., Harrison & Cantor, 1997). The purpose of this study was to investigate the extent to which media portrayals of weight affect women. Heavy and slim undergraduate women were recruited to participate. After viewing video clips in which either heavy or slim women were favored by others, participants spoke about preparing for a first date (designed to be relevant for their own body image concerns), during which their physiological responses were recorded. Finally, they had the opportunity to eat as much candy as they liked. It was hypothesized that slim participants would experience positive psychological and physiological states after viewing slim women being favored over larger women, but negative states after viewing slim women being disfavored. Heavy participants should exhibit the opposite pattern. The influences of media portrayals and psychological/physiological states on eating behavior were also examined. Results are expected to have important implications for understanding the interaction between women’s own body image and how weight is portrayed in the media.

Students
Emily Owens, Amanda Barry, Ashley Bendlin

Major
Psychology

Research Mentor
Julie Bowker, Ph. D.

Title
Cross-cultural Examination of Social Preference and Psychological Adjustment in Indian and American Middle School Aged Children

Abstract
In the United States, children’s specific social preferences, typically measured in terms of sociability, unsociability, avoidance, and shyness, are differentially associated with psychological adjustment. Results from recent cross-cultural research studies suggest that the “meaning” and psychological correlates of varying social preferences may differ across cultures, but this research has been limited by its focus on early childhood. Participants in this study were middle school students from India (N=194) and United States (N=82) who reported on their social preferences and psychological well-being. Results from 2(Group) X 2(Sex) ANOVAs revealed that Indian students reported more unsociability and shyness than did U.S. students. Correlational analyses revealed notable cross-cultural differences in the associations between social preferences and psychological well-being. In particular, significant positive associations were revealed between avoidance and psychological well-being in the United States only. These findings are consistent with previous studies suggesting that the “meaning” of social preferences differ across cultures.

Student
Arturo Perez

Major
Sociology and Psychology

Research Mentor
Dr. Sampson Lee Blair

Title
Educational Performance and Family Structure: The Impact of Family on Academic Success

Abstract
Previous studies have noted that the school performance of youth is affected by various family characteristics, few researchers have directly addressed the relative impact of family structure itself. Using data from the National Education Longitudinal Study (NELS), I examine the academic performance of adolescents and young adults who come from five different types of family structures: 1) single parent, never married; 2) two parent, married; 3) single parent,
sex rejection and acceptance for the Findings highlight the role of other-sex peer rejection (p < .07). When analyzed separately by sex, significant associations were only evident for girls. Correlational analyses revealed significant associations between both types of rejection-sensitivity and other-sex peer acceptance (p<.001), and a near-significant association between general rejection-sensitivity and other-sex peer rejection (p < .07). When analyzed separately by sex, significant associations were only evident for girls. Findings highlight the role of other-sex rejection and acceptance for the rejection-sensitivity of girls during early adolescence.

Student Collin Ranney
Major BFA Theatre Design, Technology
Research Mentor Associate Professor Lynne Koscielniak

Title DESIGN PROCESS: Travelling to Presentation

Abstract
Through both my current and past academic studies within and outside The University at Buffalo’s Department of Theatre and Dance, I have come to the opinion that to be an artist of the theatre, one must possess the visual fluency to communicate evocatively and effectively, along with the sharp intellect able to analyze the structure of a script. My design journey and experience from the department’s production of SPRING AWAKENING, ranges in scenographic expression from boldly theatrical, abstract expression, to a design that utilizes specific forms in a metaphorical way. I look forward to sharing my design with others by attending the The Kennedy Center American College Theater Festival (KCACTF) regional festival. These presentation and presenter opportunities, paired with the feedback from guest artists on my work will make the festival an effective learning experience for me. In addition these seminars give me a chance to meet and create dialogues with theatre artists I would otherwise not have the opportunity to work with.

Student Raphael Rosenbaum
Major Environmental Studies
Research Mentor Dr. Mark Seery

Title Motivational Effects of Self-Regulation on Recycling Behavior

Abstract
People use self-regulation on a regular basis, however, engaging in self-regulation can lead to failure of subsequent attempts to self-regulate. There are two competing explanations for this: (1) lack of ability or resources to self-regulate; (2) lack of motivation to self-regulate. The current research investigated physiological
responses that are sensitive to ability and motivation, thus testing the role of both in self-regulation. Participants first exerted high, low, or no self-regulation, and then completed a second task that required self-regulation. To manipulate participants’ motivation to perform well, an audience was either present or absent during the second task. Finally, participants were asked to dispose of paper; they could do so in trash or recycling receptacles, but greater effort and self-regulation was required to recycle. I hypothesized that physiological responses would support the motivational account of self-regulation failure. In addition, I expected that after accounting for participants’ attitudes about environmental issues, high self-regulation exertion would decrease recycling behavior. Anticipated findings would help understand why self-regulation fails and—given that recycling typically relies on self-regulation—what prevents people from recycling in their daily lives.

Student
Krista Scimeca

Major
Dance/ Economics

Research Mentor
Jeane Fornarola, Karen Georger

Title
OSCILLATIONS

Abstract
OSCILLATIONS is an entirely student-run production that was performed in University at Buffalo’s Katharine Cornell Theatre in February 2009. The concept of production was a showcase of works-in-progress created by sophomore UB Dance majors. These sophomores, along with sophomore sound and lighting designers, were mentored through the processes of choreography, design, staging, and performance by the senior class of UB Dance majors, as well as by faculty of their respective departments. There were primarily three objectives to this project: first, to give the director/producer valuable experience in the production process, utilizing organizational, leadership, and artistic skills that cannot be taught through any textbook; second, to provide student choreographers, designers, and technicians with a valuable learning experience to prepare for future departmental shows; third, to provide an opportunity for sophomore dance majors to rehearse and perform, which is valued by any student striving to master their craft as a performing artist.

Student
Jeremy L. Shapero

Major
Biological Sciences

Research Mentor
Charles E. Mitchell

Title
Morphometric Analysis of Graptolite Astogeny for Developmental and Evolutionary Trends

Abstract
Graptolites were a diverse clade of organisms whose colonies varied in size, shape, morphology, and more. Graptolites constructed colonies composed of a series of iterated modules (thecae) that housed the constituent zooids. Based on a series of landmarks placed around the sicula and across pairs of thecae, we used geometric morphometrics to assess changes in thecal shape during the astogeny of Upper Ordovician diplograptids. This approach allows us to describe colonies in terms of the unique features of their proximal development, their basic thecal form, and an astogenetic gradient in thecal form. We are then able to compare the astogenies of these species quantitatively in terms of the differences in these components of form.

This description can provide an effective and efficient means to assess colony form and glean information about the contribution of astogenetic heterochrony to transformation of colony form during graptolite evolution. Differences in astogenetic shape vectors may provide an additional means by which to recognize convergence in colony shape and so to independently test alternative cladistic reconstructions of graptolite phylogeny.

Student
Egle (Elle) Sirvaityte

Major
Anthropology

Research Mentor
Dr. Warren Barbour

Title
Teotihuacan Ceramics Type Collection Project

Abstract
The Teotihuacan artifact collection at the University at Buffalo has been unorganized and unanalyzed for over a decade, which keeps both local and distant faculty from utilizing it as a resource. For my research, I have pulled both decorative and diagnostic ceramic shards from the overall collection and ordered them according to time period, so that others will be able to discover patterns, transitions, and relations among the ceramics. Ideally, this will draw more attention to our collection and assist in the interpretation of Teotihuacan ceramics as a whole. I also focus on the importance and function of ceramics in Teotihuacan daily life, and how this can help us better understand the society. If professors wish, they can use the collection as a learning tool for their classes.

Student
Tomiko Stroud

Major
Chemistry

Research Mentor
Dr. Diana Aga

Title
Determination of Estrogen Concentrations in Commercial Milk, Bottled Water, and Organic Fertilizers

Abstract
Endocrine disrupting chemicals in the
environment and in food products have become a major ecological and health concern for the last 10 years. The two major endocrine disruptors are 17-α ethylestradiol (EE2) and 17 β-estradiol (E2). The concentrations that have been reported to have harmful effects in fish and wildlife are in the ng/L levels. In this experiment, accelerated solvent extraction (ASE), solid phase extraction (SPE) and liquid chromatography/mass spectroscopy (LC/MS) will be used to determine the concentrations of EE2 and E2 in milk samples and fertilizers. The ASE is an automated extraction technique that removes the analytes in question from the solid sample, while SPE cleans-up and concentrate the analytes prior to LC/MS analysis. The objective of this research is to analyze E1 and EE2 in several household items such as milk (low, skim and whole), bottled drinking water and fertilizers. Through this study, we will survey the concentrations of estrogens in these household items to determine potential daily exposure through food intake and through soil application of organic fertilizers. We will develop and optimize ASE, SPE, and LC/MS methods to allow detection at very low levels in these matrices. We will also use enzyme-linked immunosorbent assay to screen the samples without sample preparation. Ultimately, the LCMS will provide identities and individual concentrations of potential endocrine disruptors in common household items such as milk, bottled water, and fertilizer.

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**Student**

**Chris Van Patten**

**Major**

Theatre

**Research Mentor**

Associate Professor Lynne Koscielniak

**Title**

Technological Innovations on a Regional, National, and Global Stage

**Abstract**

Students will attend the United States Theatre for Technology (USITT) National Conference held in Cincinnati from March 18-21, 2009. Their conference findings will be presented to the university community and the Upstate New York and Western Pennsylvania attendees at the Upstate NY USITT section meeting hosted by the Department of Theatre and Dance, scheduled for April 2009. At the national conference, the student researchers will be attending sessions in emerging technologies developed for the stage. The students will investigate wireless integration, media projection, “green” light sources, and advancements in show control systems (sound, light, and staging). Additional focus will be put on “Theatres as Catalyst for City Revival” and investigating what the Architectural and International Commissions of USITT are developing. The student group will report on these topics, framing the discussion around opportunities for Buffalo, potential interdisciplinary work, and plans for a University at Buffalo student contingency at the 2011 Prague Quadrennial of Stage Design.

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**Student**

**Michael M. Wach**

**Major**

Biomedical Sciences

**Research Mentor**

Troy D. Wood

**Title**

Bacteria in the Soil: Using New Agricultural Methods to Alter Soil Chemistry

**Abstract**

The Bacteria in the Soil Project is an effort to alleviate the hunger crisis in Ethiopia by using a variety of new and old agricultural methods. During this experiment, Cherry Belle Radishes were planted and grown in a tank that was meant to simulate conditions similar to Ethiopia. Plants were watered twice a day, exposed to UV rays and a temperature a little above 26°C, and planted in B horizon soil. Overnight, a chiller hooked up to the tank lowered the temperature to around 10°C, simulating the extreme temperature change that takes place in the Ethiopian highlands. Bacterial inoculants were applied in equal amounts at the beginning of each trial. Trial 1 was the control group: nothing was altered as compared to normal Ethiopian conditions. Trial 2 was the experimental group testing the effectiveness of a new agricultural method of insulating soil. The soil was covered with a common black garbage bag, much like a blanket. Plants grew through specific holes in the bag and sprouted. Daily measurements of many factors were taken, as were weekly measurements of chemical levels and bacterial levels.

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**Student**

**Chelsea Wagner**

**Major**

Cultural Anthropology

**Research Mentor**

Dr. Phillips Stevens, Jr.

**Title**

American Xenophobic Attitudes and the Effects on Hispanic Migrant and Immigrant Workers

**Abstract**

The focus of my project was to examine the effects of American xenophobic attitudes toward Hispanic migrant and immigrant workers on said workers. I began my research with the history of the tense relationship between the two populations. I then sought out a group of 25 Hispanic migrant and immigrant workers, some documented and some undocumented, and conducted anthropological fieldwork in the form of interviews over the course of several months. The interviews were conducted in Spanish, my second language, as no one in the group spoke English. My research showed that despite a lack of extensive direct contact with Americans, American xenophobic attitudes have permeated the Hispanic migrant and immigrant worker population and caused deep resentment and fear among said population.
**Title**

**Technological Innovations on a Regional, National, and Global Stage**

**Abstract**

The United States Institute of Technical Theatre is holding a conference from March 18-21 in Cincinnati. I, along with a group of students from the Theatre and Dance Department, are going to gather research there. I specifically will be researching new forms of theatre, which technologies they utilize, and how they affect their communities. The University at Buffalo Community as well as the City of Buffalo itself could both follow the footsteps of other cities where new and exciting forms of theatre are stretching the boundaries of the normal art community’s role. At the Celebration of Academic Excellence I will report on what these new forms are, how they have developed, and how we, as students currently studying technical theatre, fit into this new world of the arts today.

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**Title**

**Sex Under Stress: Linking Mating to Replication Stress in the Pathogenic Fungus Cryptococcus Neoforans**

**Abstract**

The pathogenic fungus Cryptococcus neoforans causes fatal meningitis. Immunocompromised patients, especially those with HIV/AIDS, are particularly susceptible. The ability of C. neoforans to mate is known to be associated with virulence. A C. neoforans mutant generated in our laboratory exhibits enhanced mating but is hypersensitive to replication stress, leading us to hypothesize that replication stress and mating are linked. To determine if replication stress could induce mating, we observed mating in the presence and absence of hydroxyurea (HU), a DNA replication inhibitor. Observation by microscopy of mating over time revealed that HU enhanced mating. Pre-conditioning of C. neoforans with HU before mating was sufficient to enhance mating in normal media. Mating experiments with preconditioned male (alpha) and non-conditioned female (a) C. neoforans, and vice versa, showed that pre conditioning of only the male partner was required for enhanced mating in response to HU treatment. These results suggest that replication stress and mating are related in C. neoforans. Future studies will quantitate the effect of HU on mating and determine what step in the mating process is affected by HU treatment. Investigating the mechanisms by which mating is regulated may shed light on how C. neoforans causes disease.

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**Title**

**How does cardiometabolic risk index correlate with mortality rate of cardiovascular disease and diabetes?**

**Abstract**

Assessment of the Association of the Cardiometabolic Risk Index and Disease Outcome: This study focuses on identifying the existence of a relationship between the cardiometabolic risk index and subsequent disease, such as cardiovascular disease and diabetes. After identifying if there is an association, proving the predictive validity of the index and calculating the time to disease outcome are crucial goals. The results of this research will be beneficial in...
diagnosing and treating cardiometabolic diseases. The project is designed to help become familiar with nationwide datasets that are publically available for research purposes from the National Center for Health Statistics and the CDC or NIH. Searched downloaded the following data sets: NHANES (all times periods), BRFSS, SEER, Compressed mortality files, etc. and learned statistical programming language to use to enter these data and create summary statistics tables.

Student
Marda Hailu
Major
Biological Sciences
Research Mentor
Dr. Michael C. Yu
Title
The Role of Protein Arginine Methyltransferase During Gene Expression
Abstract
Proteins undergo post-translational modification in order to expand their functions beyond the twenty amino acids structures. Arginine methylation is one type of post-translational modification where methyl groups are added to the nitrogens of arginine residues within proteins. Methyltransferases are enzymes that catalyze the addition of the methyl groups. The gene that transcribes the arginine methyltransferase is HMT1 in yeast. The goal of this study is to make tagged Prp11 modules through Polymerase Chain Reaction (PCR) and introduce the modules into the yeast through transformation. After making several strains containing varying types of HMT1, coimmunoprecipitation is used to understand protein-protein interactions.

Student
Aggrey Jacobs
Major
Computer Engineering/ Electrical Engineering
Research Mentor
Dr. Ram Sridhar
Title
Security and Privacy in Pervasive Computing
Abstract
Pervasive Computing is the idea that human-computer interaction is integrated seamlessly into day to day activities and objects. These computers are subject to the same security risks as normal computers, in addition to concerns specific to these embedded computers. However, security solutions that work for normal computers can not be as easily transferred to these devices because of energy constraints. The focus of this research will be on building security solutions that are energy constrained so that they can be implemented into current and future embedded pervasive environments.

Student
Zarina Jimenez
Major
Speech and Hearing Sciences
Research Mentor
Dr. Richard Salvi, Dr. Suzanne Kraus
Title
Effect of Chemo-Therapy Drug on the Hippocampus
Abstract
The hippocampus is one of the few regions of the adult brain that contain large numbers of proliferating neurons. Thus, adult neurogenesis in the hippocampus has been hypothesized to play a fundamental role in the formation of new memories.

The microtubule-associated protein, doublecortin is highly expressed in proliferating neurons (neuronal progenitor cells), but not in proliferating glial cells or mature neurons. Thus, doublecortin serves as a specific marker for newborn neurons. The purpose of the present study was to determine if cisplatin, a widely used anti-cancer drug decreases the number of newborn neurons in the in hippocampus of the rat. Cisplatin binds to DNA and inhibits cell proliferation in rapidly dividing cancer cells; therefore, cisplatin is predicted to suppress the production of newborn neurons in the brain, specifically in the hippocampus.

Student
David E. Louis
Major
Psychology
Research Mentor
Dr. Satrajit Sinha
Title
Cloning Constructs of a Novel Isoform of p63
Abstract
The transcription factor p63 is a homologue of the tumor suppressor p53. Unlike p53, which is dispensable for normal development, p63 is critical for the development of stratified epithelial tissues such as the epidermis, breast, and prostate. p63 encodes multiple protein isoforms with both transactivating and transcriptional repressor activities that can regulate a wide spectrum of target genes. p63 is also implicated in tumor formation and progression in stratified epithelia, with evidence for both tumor suppressive and oncogenic properties. This protein seems to arouse interest in researchers not only because it is a novel isoform but also because it does not have a DNA binding domain. Identifying the function of p63 may help better elucidate the role of p63 in the development of stratified epithelia or possibly in hair follicle morphogenesis. This isoform may help us understand the transcription factor as a whole.
Title
Unexpected Localization and its Potential Functional Significance for Divalent Metal Transporter 1 (DMT1) in Wistar Kidney Proximal Tubule (WKPT) Cells

Abstract
DMT1 (Divalent Metal Transporter 1) is a transporter commonly found in endosomal/plasma membranes of cells (Abouhamed, Gburek et al. 2006; Garrick, Kuo et al. 2006). DMT1 plays a significant role in the intestine: absorbing metals that are nutrients. It can transport a variety of divalent cations such as Fe2+, Mn2+, Co2+, etc (Garrick, Dolan et al. 2003). Recently, we found DMT1 localizes to the nucleus of Wistar Kidney Proximal Tubule (WKPT) cells by both Immunofluorescent Staining and Western Blotting. We want next to know which isoforms of DMT1 localized to the nucleus and gain insights into what are their functions there. We plan to employ a series of techniques to address these goals including Immunofluorescent Staining, Western Blotting, DNA-binding column, ChIP Seq, Protein-protein Binding Assays and Metal-binding Column. Possible roles for DMT1 in the nucleus are as a transcription factor or a metal transporter. If DMT1 is a transcription factor, it will affect the transcription of DNA to RNA. Our preliminary results favor this hypothesis because DMT1 is capable of binding to nuclear DNA.

Hieu Quang Nguyen
Biochemistry

Title
The Localization of Divalent Metal Transporter 1 in Beas2B Cells Under Cobalt-mimicked Hypoxia

Abstract
This research is to find the localization of DMT1 in human bronchial epithelial cells, Beas2B cells, and how DMT1 responds to hypoxic condition. Two cell lines, one with inserted empty vector and another with part of DMT1 mRNA knocked down, were studied. By comparing the two cell lines, we tried to examine if the DMT1 responses are specific. We also tried to find out which DMT1 domain has been knocked down, as the record has been lost. With the immunostaining technique, we used the different antibodies to examine how different DMT1 isoforms respond to the Cobalt-induced hypoxia. Our data show that except +IRE, DMT1 domains Exon2, 1A, -IRE and 4EC all respond to the Cobalt-induced hypoxia condition. Current results suggest that Exon2 may be the knock-down domain. Western blot experiments are currently being conducted to examine how each DMT1 isoform respond to hypoxic conditions in the quantitative level.

Bryan Boucher, Geoff Gross, Min Xie
Industrial & Systems Engineering

Title
Blanket the City

Abstract
Partnered with local community groups, we are planning a dedicated event to fabricate Blanket-Coats. The production date will call on community volunteers for the volunteer of time and sewing machines to produce these Blanket-Coats. A Blanket-Coat is a hybrid between a blanket and a coat. The Blanket-Coat is a full-length coat made from a wool blanket and is complete with hood, pockets, extendable sleeves and an extendable hem. It is lightweight enough to be stored or carried easily, yet warm enough to protect against the frigid Buffalo winters.

Mike DiSanto
Electrical Engineering

Title
Novel Atmospheric Pressure Non-thermal Plasma Needle

Abstract
A novel atmospheric pressure non-thermal plasma needle has been developed. The device operates off of a small DC voltage of approximately 5V. A high frequency resonant transformer is used to produce a plasma excitation voltage of approximately 600V. The plasma is generated by ionizing research grade Helium gas with the plasma sustaining electrode. Typical flow rates of the Helium gas are 1 – 9.7 L/min. Current applications of this device...
are the selective killing of metastatic and pre-metastatic cancer cells and bacterial sterilization.

**Student**

**David Hastings**

**Major**

Civil Engineering

**Research Mentor**

Dr. Filiatrault

**Title**

Seismic Design

**Abstract**

We entered in to a competition this year that had us design and analyze a model high rise building constructed out of balsa wood. We had to perform various forms of computer and physical analysis to predict how it would perform in a set of three earthquakes. We constructed the model to stand 5 feet tall and it weighs less than three pounds. Various design parameters had to be followed as you would find in normal high rise construction. The model was tested at the National Earthquake Engineering conference where it ultimately finished in 7th place out of 19 participating teams.

**Student**

Carrie Hinners

**Major**

Environmental Engineering

**Research Mentor**

Dr. James Jensen

**Title**

Properties of Polyethylene Microbeads Found in Personal Care Products and their Implications on the Environment and Wastewater Treatement

**Abstract**

Pollution by plastic debris is a problem affecting both aquatic and terrestrial environments worldwide. Plastics in the environment can come in a wide range of forms and sizes from large macrolitter, such as food wrappings and beverage bottles, to small granulated-sized microlitter commonly found in skin cleaners and other personal care products. The majority of knowledge on the harmful effects of plastic on the environment concerns macrolitter, the form of plastic most commonly seen and used by humans on a daily basis. This large debris can threaten aquatic biota through ingestion and entanglement.

Little research has been performed about the fate of microlitter in the environment. This type of plastic is not well known, and most people are unaware that it can be found in the soaps and facial cleansers they use and send down the drains. Several hypotheses exist regarding the harm these microscopic-sized plastic particles could have on the environment. Accumulation of these microbeads can be ingested by aquatic and terrestrial animals. These particles can also have adsorptive properties that may enable the transport of hydrophobic contaminants.

The focus of this research is on the properties of the polyethylene microbeads found in a common over-the-counter facial cleanser. The goal is to determine various properties of the beads that play a role in wastewater treatment processes including particle diameter, settling velocity, density, and adsorptivity. Results and implications of laboratory tests will be presented.

**Student**

Benjamin Knox

**Major**

Aerospace & Mechanical Engineering

**Research Mentor**

David Forliti, Ph. D.

**Title**

Development of a Pulsed-Jet Combustor

**Abstract**

This study’s objective was to analyze the unsteady combustion of a subsonic pulsed jet combustor, with hopes of using this knowledge towards a more viable area of research, PDE’s. PDE’s (Pulse Detonation Engines) are similar to the pulsed jet combustor created in this research project but utilize supersonic detonation of the combustible mixture. A great foundation for PDE research begins with the study of subsonic pulse jets, and is the reason this research project was created. The methods used to study this unsteady combustion process were to design, fabricate and test a fully functional prototype pulsedjet combustor. A Schlieren video was created to analyze the fluid characteristics via density changes within the flow. Our results were the knowledge gained as to the nature of this unsteady flow. This insight has furthered our understanding of pulsing combustion. Our future goal is to apply these techniques to study PDE’s (Pulse Detonation Engines). In conclusion, the knowledge gained from this project will be used to study the more important area of current research, PDE’s.

**Students**

Claire Lochner, Erin Jacklin, Earl Manning, Andrew Koonce, Avi Sankar, Daniel Snitzer, Nick Catalino, Carl Eckhardt, Rob Cruz, Julia Foy

**Research Mentor**

Bill Wild

**Title**

Wind Power on Campus

**Abstract**

How much electricity do you think you use on any given day? Since electricity has been made readily available, its consumption has increased at an exponential rate. There are many forms of electrical energy production. However, such methods are often unsustainable and have a negative impact on the environment. An environmentally-friendly alternative form of energy production can come from harnessing the power of the wind. It is the goal of this project to explore with method. The project consists of two teams: the Data Collection and Analysis Team, and the Micro Wind Turbine Design and Construction Team. The Data Team is
using anemometers to collect wind speed data from selected locations around UB North Campus while the Turbine Team has designed and is in the process of constructing a prototype micro wind turbine.

**Student**
Deven McMaster & Megan Hannigan

**Major**
Industrial Engineering

**Research Mentor**
Dr. Rajan Batta

**Title**
Snow Plow Simulation of UB

**Abstract**
A simulation model for the routing of snow plows across the University at Buffalo North campus is being developed. Using the model, the most efficient approach for snow removal from the north campus will be determined.

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**Student**
Jan Panteli

**Major**
Chemical Engineering

**Research Mentor**
Dr. E. Tzanakakis

**Title**
Towards Culturing Embryonic Stem Cells in a Scalable Bioreactor

**Abstract**
Propagation of embryonic stem cells in a bioreactor will be an important step towards realization of the therapeutic potential of stem cells. Here, we examined various factors affecting stem cell expansion in a stirred-suspension bioreactor including stem cell aggregate size, oxygen consumption and agitation.

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**SCHOOL OF MANAGEMENT**

**Student**
Xiang Gao

**Major**
Management

**Research Mentor**
Dr. Debabrata Talukdar

**Title**
Role of Globalization and the Internet in Consumption Convergence Across Countries

**Abstract**
Research in macroeconomics indicates that incomes around the world have been converging in the latter half of the twentieth century, a period marked by an increasing trend towards globalization. Several researchers suggest that globalization could have mitigated income inequality between participating nations. As incomes in developing countries, people in these countries try to emulate the lifestyles of their counterparts in developed countries, leading to consumerism and triggering potential convergence in consumption levels across the world. Using both beta and sigma convergence frameworks from the macroeconomics literature, we empirically test for convergence in consumption levels across 70 countries in 18 different product categories over a period of most recent 18 years. Consumption convergence will be largely driven by cross-country interactions. Since such cross-country interactions will be more rampant in highly globalized economies, we would expect them to have faster a convergence rate. Also, advent of the Internet has greatly boosted cross-country information flow thereby accelerating socio-cultural integration across nations. Thus, the emergence of the Internet is expected to induce a further acceleration in consumption convergence rates across countries. We also test whether globalization is resulting in a bipolar world with widening consumption gap between participating and non-participating nations.

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**RONALD E. McNAIR SCHOLARS PROGRAM**

**Student**
Jarrett Coppin

**Major**
Chemistry

**Research Mentor**
Joseph A. Gardella, Jr., Sarah A. Burns

**Title**
Comparative Surface Analysis of Commercial Contact Lenses

**Abstract**
This study will compare the surface chemistry of various commercial contact lenses using Time of Flight Secondary Ion Mass Spectrometry (ToF-SIMS) and X-Ray Photoelectron Spectrometry (XPS). Normally, surface analysis is performed under Ultra High Vacuum (UHV) conditions but is hindered by the presence of water vapor. However drying the lenses will not give the true nature of the surface; therefore the lenses will be frozen using liquid nitrogen and kept in this state using a cold stage. We expect the surface characteristics to vary depending on the lenses function.

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**Student**
Asfiha G. Gebreegziabher

**Major**
Pharmaceutical Science

**Research Mentor**
Dr. Wojciech Krzyzanski

**Title**
Pharmacokinetics & Pharmacodynamics of Recombinant Human Granulocyte Colony-Stimulating Factor in Rats after Single Intravenous Injection

**Abstract**
Our purpose is to analyze pharmacokinetics (PK) and pharmacodynamics (PD) of recombinant granulocyte colony-stimulating factor (rHuG-CSF) following a single dose of intravenous bolus
administration. Normal male Wistar rats body weight of 400-600 g received a single dose of rHuG-CSF (Filgrastim) (5µg/kg, n=4) and (10µg/kg, n=4) through an intravenous injection in tail vein. Blood samples (100-200µg) were collected at different time intervals during 12 hours for PK analysis and various hours during three days for PD study. Plasma concentration of rG-CSF for PK analyze were measured by sandwich enzyme-linked immunosorbent assay, ELISA (R&D System, MN). Neutrophil count was determined using hematology analyzer (BC-2800 VET, Mindray). Pharmacokinetic parameters were calculated using WinNonlin 5.2 (Pharsight, CA). Percent increase over control for neutrophil maximum (%MNC) was applied as a marker of efficacy. Student t-test was used to determine significant difference (SAS 9.1, SAS Institute). CL decreases with increasing dose (53.9, and 15.8ml/h/kg), likewise the Vss (105 and 32.2 ml/kg). %MNC significantly different (p<0.05) from zero and MNC peak happens at 12 hour. rHuG-CSF displays nonliner PK in rats. CL and Vss are dose dependent. Our study shows that single dose of rHuG-CSF increases neutrophil count and it was saturated at dose 5µg/kg.
and over various sites. The experiment is conducted in an inverted microscope within a temperature-controlled chamber, and imaged at different sites at successive time points in order to obtain time-lapse microscopy images. These results have demonstrated over 90% killing at the point of impact for melanoma cells compared to approximately 10% killing for Keratinocytes. Further characterization of the mechanisms of cell death will help develop a novel technology that may have clinical implications.

Student
Kevin Barnum
Major
Biochemistry
Research Mentor
Gabriela Popescu, Ph.D.

Title
Role of Pore Residues in NMDA Receptor Gating

Abstract
NMDA receptors (NMDARs) are glutamate-gated ion channels that are critical to brain function. The channel pore constitutes a central element of gating, conferring ionic permeability and specificity, and coupling ligand-binding with ion flow. Because the crystal structure of the NMDAR channel pore is not available, we used its strong sequence homology with the bacterial KcsA channel to formulate hypotheses about the roles of particular residues in gating and permeation. We used single-channel current recordings and kinetic analysis to investigate the role of pore residues W608 and G612 in channel gating. We will use these data to develop hypotheses about the influence of pore residues on gating and permeation.

Student
Robert Borowski
Major
Biochemistry
Research Mentor
Dr. Wilma Hofmann

Title
Analysis of Intracellular Actin in Nemalin Myopathy

Abstract
Introduction: Nemaline myopathy is a congenital disease that affects skeletal muscle. This devastating disease can show both early infantile onset and later adult onset. While most cases cause generalized weakness and a slowing of motor milestone progression, the severity of symptoms shows great variance and correlates with specific point mutations.

Background: Nemaline myopathy is caused by mutations in alpha-skeletal actin that lead to intranuclear and cytoplasmic rods. Cytoplasmic rods lead to changes in the contractile unit and the ultimate manifestation of the disease. However, the intranuclear rods do not cause change in the contractile unit. Discovering how these rods contribute to the disease is one of our goals. Actin is a major nuclear protein involved in such important functions as transcription.

Hypothesis: Nuclear actin rods interfere with nuclear functions.

Method: Point mutations were induced in actin to induce intranuclear rod formation. This step creates a baseline for our work. Analysis of rod aggregation with transcription factors and RNA polymerase will be displayed via co-localization.

We hope to learn about the underlying cause of nemaline myopathy. This is the first step to developing a much-needed cure.

Student
Felicia Cao
Major
Biochemistry
Research Mentor
Dr. Thomas B. Tomasi, M.D., Ph.D.

H = University Honors Student
C = CURCA Funded Project
**Title**  
**NFKB Regulation of Dicer Expression**

**Abstract**  
Proteolysis is important for normal cellular function. In E. coli the ClpP peptidase associates with the ATPase ClpA to form a protease complex. The purpose of this study was to identify residues within the ClpP peptidase that are involved in molecular interactions with ClpA. We designed a system to select for dominant negative ClpP mutants based on the accumulation of a reporter substrate. In vivo degradation experiments indicated that the reporter substrate was not degraded efficiently by ClpAP. Even ectopically expressing ClpA and knocking out ClpA inhibitors did not enhance the degradation of our reporter substrate. Further, a competition assay suggested that the reporter substrate is not able to bind ClpA efficiently. We are modifying the reporter substrate to improve binding to ClpA. In the future we can test for degradation of the modified substrate in vivo and can also vary the levels of the modified substrate to select ClpP mutants.

**Student**  
**Casey Kilpatrick**

**Major**  
Biochemistry

**Research Mentor**  
Dr. Elizabeth Repasky

**Title**  
**Physiologically Relevant Temperature Shifts Affect T Cell Lipid Raft Aggregation In Vivo**

**Abstract**  
Physiologically relevant increases in temperatures, such as fever (38°-40°C), can improve the immune response. Understanding the mechanisms of how fever affects different immune subsets could aid in better disease treatments. T cell activation requires a primary signal through a TCR/CD3 receptor and a secondary signal through a co-stimulatory molecule which requires lipid raft aggregation. Previous results have shown that incubating T cells at fever-ranged temperatures in vitro results in increased membrane fluidity and lipid raft aggregation. Therefore, we hypothesize that whole body hyperthermia (raising temperature of mice to 39.5°C) will cause an increase in lipid raft aggregation in T cells. To test this hypothesis we administered hyperthermia to mice for 6 hours and harvested cells from the spleen and lymph nodes. To identify lipid rafts we stained cells with fluorescently labeled CTxB to visualize the lipid raft marker GM1 and used Imagestream flow cytometry to determine aggregation of different immune cell subsets. We observed a threefold increase in the number of T cells with lipid raft aggregates upon heating. Current work in the lab is examining whether the hyperthermia induced increase in lipid raft aggregation has an effect on T cell activation and cytotoxicity.

**Student**  
**Sheryl Larson**

**Major**  
Nuclear Medicine Technology

**Research Mentor**  
Elpida S. Crawford, MS, CNMT

**Title**  
**A Survey of Thyroid Gland Scintigraphy**

**Abstract**  
The Society of Nuclear Medicine (SNM) published procedure guidelines for thyroid imaging in 1999. Our study was to determine how many clinics performing thyroid imaging follow the guidelines and to what extent. Of particular interest to us was the choice of collimator.

**Method**  
A 10 question survey was developed to obtain information on how hospitals perform thyroid imaging. The survey was sent to 350 hospitals randomly selected from 11 different states in the northeastern United States.

**Results**  
One hundred and sixty five (165) surveys (47%) were returned. The majority of clinics that responded,
obtain a history, hyperextend the neck, and obtain anterior and anterior oblique views. Twenty five percent (25%) of the respondents obtain all their image with parallel hole collimator. Seventy five percent (75%) use a pinhole collimator or a combination of both. There was much variability in number of counts or time used for acquiring the images. Less than half of the respondents palpate the neck for correlation with the scan.

Conclusion: The survey results indicated that many clinics do not follow the recommendations of the SNM Guidelines. The major deviations from the guidelines occurred with the choice of collimator, the number of counts and/or amount of time used to acquire images and with neck palpation for correlation with the scan.

Student
Yi Kan Leung

Major
Biotechnology

Research Mentor
Dr. Zohara Sternberg

Title
Therapeutic and Weight Effects of Acamprosate in EAE

Abstract
Multiple Sclerosis (MS) is an autoimmune disease characterized by CNS inflammation, demyelination and axonal injury of the neurons. So far, there is no cure for this disease, and treatments currently available have limited effects and applications. Acamprosate (Campral®) is an FDA approved drug for treating alcoholism. Research has shown that this drug is neural-protective, so the hypothesis of this work is that Acamprosate (Campral®) may help treat and reduce severity of MS with applicability in a wider range of patients and with fewer side effects than currently employed therapy. Experimental Autoimmune Encephalomyelitis (EAE) mice are used as an animal model for MS; healthy mice were induced with MOG peptides to induce the disease and then treated with drug or placebo and monitored for changes in weight and symptoms. Although the number of mice in which the disease was successfully induced was low and thus the results were below statistically significant numbers, the observation and data collected were both promising. Healthy mice were also treated with drug or placebo without EAE induction to investigate the effect of Acamprosate on the weight of healthy mice. Although the drug seems to help reduce weight loss in EAE mice, it seems to induce weight loss in healthy mice.

Student
Alex Morrison-Nozik

Major
Biomedical Sciences

Research Mentor
Jerome A. Roth, Ph. D.

Title
The Use of Minocycline for the Treatment of Manganism

Abstract
Manganese (Mn) intoxication, a syndrome known as manganism, is most often associated with prolonged occupational exposure and initially consists of behavioral, intellectual and cognitive deficits, which eventually develops to an irreversible dysfunction resembling Parkinson’s disease. Manganism is primarily linked to the degeneration of GABAergic neurons within the globus pallidus and transport of Mn by divalent metal transporter (DMT-1) is considered to be the rate limiting step for toxicity. Mn toxicity occurs via inhibition of mitochondrial function resulting in formation of reactive oxygen species. Mn which accumulates in the globus pallidus stimulates microglia to release inflammatory cytokines which in turn activates a variety of transcription factors including NF-κB in the surrounding neurons. Activation of NF-κB by cytokines and/or oxidative stress produced by Mn stimulates transcription of a select set of genes including DMT-1. Minocycline, a clinically available antibiotic that attenuates microglia activity and possess antioxidant properties, was examined for its ability to inhibit DMT-1 transcription in human neuroblastoma cells produced by the oxidative stress inducing agent lipopolysaccharide (LPS). Results of these studies reveal that minocycline prevents NF-κB activation of DMT-1 transcription suggesting that minocycline may possibly prevent Mn accumulation in the globus pallidus and thus, be a useful treatment for manganism.

Student
Nilofar Sarvaiya

Major
Biomedical Sciences

Research Mentor
Naveen Bangia, Ph. D.

Title
The Role of Lenalidomide in Treatment of B-Chronic Lymphocyte Leukemia

Abstract
Mitochondria regulate cell survival, apoptosis, and proliferation depending on nutrient availability and stress conditions. Disregulation of mitochondria in tumor cells allow their growth in stress conditions that would arrest normal cellular proliferation. Preliminary data in the laboratory suggest that tumor growth in mice is decreased when tumor cells are deficient for a protein called Proteasome Activator 200 kD (PA200). PA200 is reported to be a nuclear protein that responds to ionizing radiation (IR)-induced stress. Preliminary data suggest that PA200 deficiency in mammalian cervical cancer cells results in decreased mitochondrial mass. How PA200 regulates mitochondria is unknown. The goal of the current study is to determine if PA200 is located in the mitochondria. Preliminary data suggests that PA200 does not co-fractionate in the mitochondria under basal conditions. Future studies will focus on whether stresses such as IR cause an accumulation of PA200 in the mitochondria.
Title
Tannerella Forsythia S-Layer: Solving the Layer of Complexity!

Abstract
Tannerella forsythia is a gram-negative bacterium that lives in the human oral cavity. T. forsythia grows in an anaerobic environment that is created as normal floral produce byproducts of sugar metabolism. Such environments can become stable in the subgingival space between the teeth and the gum tissues. Poor hygiene practices over a long period can allow T. forsythia to grow leading to periodontitis, which if left untreated will result in inflammation in the tooth supporting bone and tissue, tissue recession and can ultimately lead to tooth loss. Two glycoproteins have been found to be expressed on the S-layer, outermost cell coating, of T. forsythia. We have shown that T. forsythia can agglutinate with Fusobacterium nucleatum, another oral bacterium. The current experiment is to purify the two glycoproteins mentioned in order to use them for further investigations of their role in host cell interaction and disease progression.

SCHOOL OF NURSING

Student
Allison Dunster & Timothy O’Connor

Research Mentor
Yu-Ping Chang, Dr. Laura Wray

Title
A Pilot Study of Measuring Psychotherapeutic Drug Misuse in Older Adults

Abstract
Purpose: In studying our growing older population (aged 65 and over), there is limited research investigating the prevalence of drug misuse, specifically with psychotherapeutic medications. One of the first steps in investigating this topic is to establish an evaluation tool in which the psychometric properties are able to obtain reliable and valid results for the desired population. The Time Line Fol-
Purpose: Alcohol is used by more than one in ten individuals to self-medicate sleep problems. Yet, consuming alcohol can disrupt sleep architecture and sleep continuity. Individuals with lung cancer have disproportionately high rates of sleep problems. Furthermore, chronic heavy alcohol use increases the risk for and acute respiratory distress syndrome. Thus, any amount of alcohol use by individuals with compromised lung function may be consequential. The purpose of this study was to examine the impact of alcohol use on sleep for individuals with lung cancer.

Methods: Patients with lung cancer were recruited from a VA inpatient unit for this descriptive study. Participants completed a paper-pencil survey including questions related to the frequency and amount of alcohol consumption, smoking history, the Pittsburgh Sleep Quality Index (PSQI), and demographic information. Descriptive statistics were obtained.

Results: The sample (n=31) was predominantly male (97%) and Caucasian (64.5%) with a mean age of 64 years. All had a history of smoking with 19.4% currently smoking from three to 40 cigarettes/day (mean=19). Of those reporting, 62% acknowledged any alcohol use with more than one-third drinking at least two days/week, 23.5% drinking greater than five drinks per week, and about 19% drinking six or more drinks on occasion daily, weekly, or monthly.

Conclusions: This sample illustrates the importance of assessing for substance use and sleep problems in these medically compromised individuals. The poor sleep quality for the entire sample calls for further examination of the relationship between alcohol consumption and sleep in a larger sample.

Implications for Practice & Research: The study’s findings have very significant implications for nursing practice and identified several issues which need to be addressed by nurse researchers. The findings highlighted the critical need for consensus among health related professions regarding who is considered old, specific age ranges utilized to define older adults, and phases of development that older adults may anticipate experiencing while growing older. Acknowledging the differences in what may be considered the routine experiences of an individual who is ninety-five years old versus one who is sixty-five years old is important in understanding the health needs of both persons. Having widely varying classifications among nursing and health related professions regarding the range of ages constituting an older adult and regarding who is defined as “old,” limit health care providers’ ability to develop accurate perceptions of older individuals.

SCHOOL OF PHARMACY & PHARMACEUTICAL SCIENCES

Student
Loreen Osei Agyemang

Major
Pharmaceutical Sciences

Research Mentor
Dr. Aiming Yu

Title
HPLC Method for the Analysis of Harmaline & its Metabolite Harmalol

Abstract
Purpose: Harmaline and harmalol are found in the seeds of Peganum harmala L. It is a herbal plant from Eastern Mediterranean and Northern India. Harmaline is a central nervous system stimulant. It is also a reversible MAO-A inhibitor and a serotonin antagonist. Small doses of harmaline, about 25-50 mg
acts as mild therapeutic stimulant while a larger dose, about 750 mg, produces hallucinogenic effects. This compound also has other pharmacological actions including binding to the benzodiazepine receptor. It also has anxiolytic effects and also anticonvulsant actions.

Methods: HPLC analysis was done by isocratic elution and the flow rate was 1.00 mL/min, Mobile phase A consisted of water with 0.1% TFA and mobile phase B consisted of 90% Acetonitrile with 0.1% TFA. Each compound was injected (5 µL) into the column for ten minutes. The Fluorescence detector was 357 nm for excitation and 475 nm for emission. The experimental validation consisted of selectivity (Blank, blank, blank + standards, representative sample), calibration curves ranging from 0.78~25 µmol/L, intra-day precision and accuracy (n=3), inter-day precision and accuracies (n=9). The concentrations used for the intra-day and inter-day assay were 1.67, 5 and 15 µmol/L.

Results: Precision for the inter-day precision for harmalol was from 2.2% to 2.6%, for harmaline was from 2.1 to 2.6%. The intra-day for accuracy for hamalol was from 102.0% to 105.5%, and for harmaline was from 101.1% to 106.6%.

Conclusion: This method is appropriate for the quantification, identification, and analysis of harmalol and harmaline. The method shows good inter-day and intra-day precision and accuracy. This method is simple, rapid, and sensitive for the analysis of these compounds.

Abstract
Dosing of aminoglycoside antimicrobials requires precise characterization of volume of distribution (V). Currently, correction factors for V of Gentamicin and Tobramycin in obese patients are distributed over a seven-fold range. To date no study has examined the impact of either body weight or obesity on the 24-hour area under the concentration-time curve (AUC0-24). The primary objective of this study is to examine the correlation between AUC0-24 and body weight and compare the results with V.

231 Gentamicin and Tobramycin treatment courses were retrospectively analyzed. Clinical and pharmacokinetic (PK) properties were collected through chart review, while body mass index (BMI) ideal body weight (IBW), and dosing weight (DW) using a dosing weight correction factor of 0.4 were calculated for all patients. Patients were grouped as normal weight and overweight based on BMI (BMI<25.00 kg/m2 and BMI≥25.00 kg/m2, respectively). Corrected AUC0-24 was calculated using a dose targeting a peak of 6 mg/L and trough of 1 mg/L. Between group differences were analyzed using T-test with p<0.05 considered significant.

148 patients were in the normal weight group and 83 patients were in the overweight obese. Central volume of distribution (V1) was 15.3 L and 17.1 L for normal and overweight patients, respectively (p=0.005). AUC0-24 was 79.6 mg*h/L and 53.5 mg*h/L for normal and overweight patients, respectively (p=0.003). Corrected AUC0-24 was 73.6 mg*h/L for normal weight patients and 73.8 mg*h/L for overweight patients (p=0.90).

This study reveals that AUC0-24 acts independently of body weight as our simulations were able to achieve the same AUC0-24 for all patients. This was not the case for V which demonstrated differences between patient groups, which was consistent with previous studies. AUC0-24 could act as a correction factor and eliminate the need to stratify patients based on weight.

Student
Lisa Imbrogno
Major
Pharmacy
Research Mentor
Jerome J. Schentag, PharmD

Title
A Retrospective Pharmacokinetic Analysis of Aminoglycoside Dosing Methods and AUC0-24 in Normal & Obese Postpartum Patients

Abstract
The physiologic changes that occur during pregnancy and the postpartum period mirror those that occur in obesity and affect the same pharmacokinetic parameters. Total body weight is used to empirically dose this patient population, however, suboptimal aminoglycoside doses still occur due to increases in body mass, glomerular filtration and renal blood flow, and variable changes in fluid status. Dosing methods associated with adjusted body weight have been examined in attempt to provide postpartum patients with therapeutic peak concentrations. A comparison of body mass index (BMI) to other representations of body weight in relation to central volume of distribution, clearance, elimination rate constant, half-life, and 24-hour area under the concentration-time curve (AUC0-24) was conducted.

BMI responded similarly to the other representations of weight. The lack of a relationship between AUC0-24 and each representation of weight suggests that AUC0-24 is independent of these changes. Based on these results, predicted peaks and troughs were calculated by a theoretical dosing method targeting this subpopulation’s mean AUC0-24 and compared to those calculated from a standard dosing method. Theoretically the AUC0-24 method produces optimal peak concentrations and corrects for the alterations in clearance in this patient population; further research is necessary to assess the true predictability.
Conclusions: Our results indicate that both biochanin A and 8-methylflavone can inhibit BCRP-mediated mitoxantrone efflux in MDCK/Bcrp1 cells. Further in vivo studies are needed to investigate the effect of these flavonoids on the pharmacokinetics of mitoxantrone.

Acknowledgements: Funding from Komen Breast Cancer Foundation.

Results: The data showed that ethanol increased the percent encapsulation of IL-12 in liposomes by an average of 20%.

Conclusions: Ethanol increases the interdigitation of the DSPC/DMPG bilayer, thereby increasing the encapsulated aqueous volume for higher encapsulation of the protein.

Results: The data showed that ethanol increased the percent encapsulation of IL-12 in liposomes by an average of 20%.

Conclusions: Ethanol increases the interdigitation of the DSPC/DMPG bilayer, thereby increasing the encapsulated aqueous volume for higher encapsulation of the protein.
μmol/ml and the concentration of calcium was raised step by step. The absorbance was measured 2 minutes after changing the calcium concentration. It was repeated until the absorbance no longer changed. The experiment was repeated twice with different lipid formulations (80%PI:20%DMPC:5%cholesterol & 100%DMPC:5%cholesterol)

Results: For formulation 50% DMPC:50%PI:5% cholesterol, there was a distinct aggregation from 5-7 mM. For 80%PI:20%DMPC:5%cholesterol, signs of aggregation are slightly lower around 4-5 mM. For the control, 100%DMPC:5%cholesterol, there are no signs of aggregation from 0-10 mM.

Conclusions: It can be concluded there is a change in absorbance in the presence of calcium due to the formation of large aggregates. With the presence of Phosphatidylinositol, the aggregation is more distinct. This will cause an increase in the path light scattering centers as a result of decrease concentration of light scattering centers.

Student
Charles Venuto

Major
Pharmacy

Research Mentor
Dr. Gene Morse, Dr. Qing Ma

Title
Comparison of Antiretroviral Therapy (ART) Pharmacokinetics (PK) & Clinical Monitoring Parameters in HIV-Infected Patients with & without Substance Abuse

Abstract
Background: Substance abuse (SA) increases the risk of HIV transmission, and may influence the progression and treatment of HIV infection. The objective of the present study is to compare antiretroviral PK and clinical monitoring tests in HIV patients with/without SA.

Methods: We conducted a multicenter study that enrolled HIV-infected patients receiving ART for more than 6 months with/without SA. Data collection included demographics, ART plasma concentrations, and typical laboratory monitoring tests. Clinicians identified active SA according to NIDA criteria.

Results: Among the 275 patients enrolled, 47% were active users of at least one substance including heroin (2%), cocaine (7%), marijuana (13%), tobacco (43%), alcohol (22%), and prescription opioids (14%). Approximately 40% of these patients abused multiple substances. There were no significant differences between groups for race, gender, age, or CD4 count. A significantly higher proportion of patients with SA had unfavorable treatment outcomes with an HIV RNA > 75 copies/ml compared with patients without SA (40% vs. 28%, p=0.044). Logistic regression model revealed an association between low virologic response, African-American race (p=0.017), and potentially tobacco use (p=0.067). A significantly higher proportion of substance users also had an ART concentration below the therapeutic trough range (23% vs. 9%, p=0.048).

Conclusions: Our results indicate that HIV substance abusers can be successfully enrolled and monitored in ART PK programs and that they continue to have important differences in viral load suppression and ART concentrations compared to those without active SA. These data suggest that future studies on a combined treatment approach including ART PK monitoring, integrated SA treatment, and adherence support are warranted to maximize benefit of current treatment regimens among HIV substance users.

Student
Liliana Yohonn

Major
Pharmacy

Research Mentor
Dr. Curtis E. Haas and Dr. Brian T. Tsuji

Title
Comparison of Antiretroviral Therapy (ART) Pharmacokinetics (PK) & Clinical Monitoring Parameters in HIV-Infected Patients with & without Substance Abuse
HEALTH PROFESSIONS

Title
Dose-Dependent Effects of Caffeine on Physiology & Behavior in Adolescents

Abstract
The effects of caffeine in children and adolescents remain understudied and poorly understood. The purpose of our study was to tolerance to the effects of caffeine in adolescents and to examine the effects of acute (dose) and chronic (group) caffeine on snack food intake, perception of sucrose solutions, and use of other substances. Adolescents, ages 12 – 17, visited our lab on four occasions, each separated by 1 week. They consumed a beverage containing 0mg, 50mg, 100mg, or 200mg of caffeine (order counterbalanced). They completed a behavioral checklist, repeated heart rate and blood pressure measurements, questionnaires to assess licit and illicit substance use, hand tremor test, a sucrose detection panel, and an ad libitum eating session. We found a dose-dependent increase in blood pressure and decrease in heart rate regardless of chronic caffeine consumption. We also found group, dose, and dose by group interactions on hand tremor. Low caffeine consumers were more likely to report consuming alcohol than high caffeine consumers. Finally, there was an interaction of group and dose on perception of sweetness. When taken together, these data suggest that caffeine has a broad range of effects on physiology and behavior in adolescents, but we found little evidence for tolerance.

Student
Kathryn Finn & Cassandra Beck

Major
Exercise and Nutrition Sciences

Research Mentor
David Mandeville, Ph. D.

Title
The Relationship between Tibial Torsion and Dynamic Loading for Medial Knee Osteoarthritis

Abstract
Objective: Early identification of medial knee osteoarthritis (KOA) requires an understanding of the impact that tibial torsion (twisting) deformity has on the knee loads that drive disease progression. The purpose of this study was to quantify the relationship between tibial torsion and knee loading in KOA.

Methods: Ten volunteer subjects were divided into two groups: 1) end stage medial KOA (KOA, n = 5, age = 64.6 ± 7.5, BMI = 35.5 ± 5.7); and 2) healthy controls (CON, n = 5, age = 63.4 ± 4.3, BMI = 27.0 ± 2.3). Torsion of the tibia was assessed at Buffalo General Hospital using computed tomography (CT). Gait analysis (8 cameras, 2 force plates) was conducted at the UB biomechanics Laboratory and quantified knee loading during level walking. Independent t-tests were used to assess between group differences, and the Pearson product moment was used to assess the correlation between torsion and loading.

Results: KOAs had a significantly greater BMI and significantly more tibial intorsion than CON; however, knee loading was not significantly different. Tibial torsion was not correlated to knee loading.

Discussion: Preliminary results indicate that tibial torsion deformity does not predict knee loading during walking for medial knee osteoarthritis.

Students
Chung Lin, John Griffin, Pooja Makhija

Research Mentor
Peter Horvath, Ph. D.

Title
Performance Drink, a glucose polymer drink, for prolonging exercise

Abstract
Glucose availability is a major limiting factor of prolonged high intensity exercise performance. Muscle glycogen is an important source of glucose during long-term exercise; strategies to enhance performance include reducing the rate of glycogen utilization through increased use of either lipids or blood glucose. We proposed that the unique formulation of Performance Drink® could provide a ready supply of glucose, but does not trigger the insulin surge commonly observed with ingestion of carbohydrate drinks. Subjects were well trained cyclists capable of cycling for 2 hours at 70% of their maximum aerobic capacity. At session one, a VO2 peak test was performed. Sessions two through four the subject consumed either, a) water b) Performance Drink, or c) an iso-caloric equivalent drink of the Performance Drink base 30 minutes before exercise. The subjects were tested for cognitive function, blood samples, expired air, heart rate, body temperature, glucose and lactate throughout each session. Results of the study showed glucose containing drinks preserved blood glucose better during the 2 hour cycling. Cycling time and power output were not significantly different for any of the drinks. Performance Drink does not provide a superior alternative to other glucose drinks or water for prolonging high intensity exercise performance.

Students
Ravinder, Pooja Makhija, Diane Lochocki, Chung Lin

Research Mentor
Peter Horvath, Ph. D.

Title
Nutritional Status and Intake Post Nutritional Supplementation in Prostate Cancer Patients
Abstract
Background: Patients bearing cancer therapy show decreased appetite, declining nutritional intake and status. A mass of beliefs on nutritional supplementation during treatment arise in the literature.

Purpose: Show nutritional outcomes of supplementation with a Dietary Reference Intake, DRI plus Orthomolecular, and placebo. 53 Prostate cancer patients were followed 4 times, with blood draws, weight, hydration status, body composition, surveys, and 3 day diet records taken.

Results: Imbalance in Placebo of increasing Energy Expenditure and decreasing Energy Intake was shown, DRI and OM showed no change over time. There was significant disparity in carbohydrate use amid Placebo and DRI groups. DRI and OM did not vary Carbohydrate intake, Placebo decreased carbohydrate intake. Several micronutrients increased at T3 and T4 in OM and DRI, compared to Placebo. Micronutrients were significantly higher in OM vs DRI at T3 and T4.

Conclusions: Energy balance became more negative over therapy in Placebo, due to a boost in reported action and a decrease in carbohydrate intake. No weight change arose, negative energy balance increase may be due to lack of micronutrient intake combined with radiation therapy. Addition of DRI and OM brought all subjects to DRI standards.

Undergraduate Academies
UB’s Undergraduate Academies are communities of common interests that focus on three broad issues: Civic Engagement, Global Perspectives and Research Exploration. The Academies provide students with a distinctive and comprehensive undergraduate experience.

Global Perspectives Academy
The Global Perspectives Academy is a diverse community of students and faculty committed to exploring international affairs and enhancing campus awareness of the ways in which our global society is truly interdependent. Under the direction of Dr. Claude Welch, Academic Director and Distinguished Service Professor, Department of Political Science; students have selected their research topics on a broad range of issues that reflect the globalization of social problems and concerns.

Student Elsa Gigante & Kristen Hibit
Title A World Of Verbal Influence

Student Tauheeda Scott & Alex Durinka
Title Comparative Religions

Student Carolyn Wynne, Elana Paolucci & Ji Hwe Kim
Title Health Care Systems Throughout the World

Student Jordan Zygis, Erin Desmeules & Mary Monahan
Title Comparative Education

Research Exploration Academy
The Research Exploration Academy supports students’ efforts to learn more about, and to participate in, research activities at UB. Students enrolled in the Research Exploration Academy Seminar meet for 1 hour each week, where they identify, plan, and answer a specific research question. Under the direction of Academic Director, Dr. Tracy Gregg, Associate Professor, Department of Geology, students created an original research topic that matched with their own interests.

Student Andrew J. Davidowitz
Major Pharmacy
Title The Effects of Caffeine on Cognition

Student Gayatri Dhumal
Major Economics
Title The Relation Between Student Enrollment and Financial Aid at UB with Economic Reason

Student Lestha Isaacs
Major Psychology
Title The Frequency of Cell Phone Use Among University at Buffalo Students

Student Christopher Kryszak
Major Media Studies
Title The Impact of Technological Advancement on Today's Education
Student
Caroline M. Shin
Major
Psychology
Title
The Effects of Aroma on Motor Reaction Time

SIGMA XI
Student
Salah Alzaiti
Major
Nursing
Title
Computer versus Manual Calculations of the Spatial QRS T Angle

Student
Timothy Ung
Major
Architecture
Title
The Psychology of Light in Space

Student
Tanesha Whyte
Major
Social Sciences
Title
The Effect of Iron on Short-term Memory

Student
Soham Chanda
Major
Biological Sciences
Title
Modulation of Synaptic Gain by GABA at the Endbulb of Held

Student
Brandon Brown
Major
Exercise and Nutrition Sciences
Title
Reduced tyrosine Kinase B signaling may attenuate neuromuscular adaptation to exercise

Student
Arup Dey
Major
Biotechnical and Clinical Laboratory Sciences
Title
Mechanistic analysis of Aminolevulinic acid in an attempt to decrease specific immune response
Student  
Courtney A. Edwards  
Major  
Biotechnical and Clinical Laboratory Sciences  
Title  
Humanization of the JAA-F11 Antibody

Student  
Theresa Guarrera  
Major  
Industrial and Systems Engineering  
Title  
Evaluating the Creation and Interpretation of Causal Influence

Student  
Umamaheswara Konda  
Major  
Mechanical and Aerospace Engineering  
Title  
Source Estimation for CBRN incidents based on field data

Student  
John Fischer  
Major  
Cellular-Molecular Biology  
Title  
Antisense RNA Recapitulates the Epigenetic Effect Induced by a Leukemia Protein

Student  
Amanda Hintz  
Major  
Geology  
Title  
Physical Volcanology and Hazard Analysis of a Young Volcanic Field: Black Rock Desert, Utah, USA

Student  
Siddharth Krishnan  
Major  
Biotechnical and Clinical Laboratory Sciences  
Title  
The effect of conjugated linoleic acid isomers on mast cells in vitro

Student  
Rashmi Ganesh  
Major  
Biomaterials  
Title  
Lubrication of natural tissues with special focus on saliva substitutes to overcome dry mouth symptoms

Student  
Siddharth Jaggavarapu  
Major  
Biotechnical and Clinical Laboratory Sciences  
Title  
HDL remodeling in the ovarian follicle

Student  
Anu Shilpa Krishnatry  
Major  
Pharmaceutical Sciences  
Title  
Nitroglycerin-induced MMP-9/TIMP-1 expression changes are linked to NF-κB activation in macrophages

Student  
Daniela Geba  
Major  
Social and Preventive Medicine  
Title  
Uric Acid as a Predictor of Incident Hypertension: The Western New York Health Study

Student  
Harsh Jain  
Major  
Chemistry  
Title  
Studies on the mechanism of inhibition of thymidine phosphorylase by substituted uracil derivatives

Student  
Ravi Kumar  
Major  
Mechanical and Aerospace Engineering  
Title  
Image Guided Tracking of Internal Organ Motion for Radiation Therapy

Student  
Alex Gregorski  
Major  
Interdisciplinary Master of Science  
Title  
Disruption of the Circadian Clock in Breast Epithelial Transformation

Student  
Rohan Kaushal  
Major  
Biotechnical and Clinical Laboratory Sciences  
Title  
Optimization and standardization of GC ECD method for the low level determination of PBDEs

Student  
Thomas R. Leach  
Major  
Aerospace and Mechanical Engineering  
Title  
Control Formulation with State Constraints for Unmanned Helicopters
Student
Rene Lisjak
Major
Anthropology
Title
Quantification of fetal spinal growth using computed tomography

Student
Satya Nayak
Major
Biomaterials
Title
Development of a Test Model for Enhancement of Endodontic Imaging

Student
Priyadarshini Pennathur
Major
Industrial and Systems Engineering
Title
Evaluating Emergency Department Information Technology Using a Simulation based Approach

Student
Shannon Lupien
Major
Psychology
Title
Are All Positive Role Models Equally Beneficial? Effects on Motivational Responses in Competition

Student
Quan Nguyen
Major
Mathematics
Title
The amplitude statistics of the cubic quintic nonlinear Schrodinger equation

Student
Priyadarshini Pennathur
Major
Industrial and Systems Engineering
Title
An Information Trail Model for Capturing Human Behavior in Artifact Creation and Use in Work Systems

Student
Eric Milliman
Major
Biological Sciences
Title
High resolution Genome Mapping of a S. cerevisiae PRMT

Student
Nathaniel Page
Major
Pharmaceutical Sciences
Title
Selective activation of organic nitrates by, and inactivation of, ALDH isoforms

Student
Natalie Punt
Major
Immunology
Title
Patient Tumor Xenografts in SCID Mice Become Vascularized by Endothelial Cells of Host Origin

Student
Jonathan Missel
Major
Aerospace and Mechanical Engineering
Title
VERTIGO: Autonomous Biaxial Inverted Pendulum

Student
Suresh Pendam
Major
Exercise and Nutrition Sciences
Title
Stimulation of Dehydroascorbate Recycling in a Cell Culture Model of Septic Endothelium

Student
Chaitanya Puranik
Major
Biomaterials
Title
Optimization of Radio Frequency Glow Discharge Treatment to control resorption of polylactide

Student
Sucharita Mitra
Major
Biotechnical and Clinical Laboratory Sciences
Title
Effect of Intense Noise on Neuronal Stem Cell Production

Student
Todd Penman
Major
Biomaterials
Title
Friction testing of lubricated biomaterials/tissue couples

Student
Su Qian
Major
Biostatistics
Title
Discriminant Analysis of IVF Data Based on Partial Least Squares Regression
Student
Rajesh Rao
Major
Immunology
Title
The energy sensitive kinase mTOR regulates T-bet mediated heritable type 1 effector cell fate of CD8 T cells

Student
Anand Shankar
Major
Biotechnical and Clinical Laboratory Sciences
Title
A Novel Technique to Find Peptide Ligands of the Aryl Hydrocarbon Receptor

Student
Menachem Tobias
Major
Biotechnical and Clinical Laboratory Sciences
Title
Effects of dietary folate on alcohol induced breast cancer susceptibility

Student
Monica Ridgeway
Major
Geology
Title
Geographical Information System Approach for Mapping Surficial Geology: An Example from Central N.Y.

Student
Yunfei Song
Major
Mathematics
Title
An efficient and accurate Chebyshev spectral collocation method for pricing bonds

Student
Trupti Vardam
Major
Immunology
Title
Role of STAT Three in Promoting ICAM One Dependent Lymphocyte Trafficking During Thermal Stress

Student
Mary Russell
Major
Mechanical and Aerospace Engineering
Title
Outcomes From Valgus Bracing for Persons with Knee Osteoarthritis

Student
Swetha Sridhar
Major
Biotechnical and Clinical Laboratory Sciences
Title
Immunohistochemistry of carcinomas using monoclonal antibody, JAA F11

Student
Omkara Lakshmi Veeranki
Major
Biotechnical and Clinical Laboratory Sciences
Title
Anti inflammatory cytokine Il10 and mammary gland development

Student
Dharam Tayal
Major
Biomaterials
Title
Patient Tumor Xenografts in SCID Mice Become Vascularized by Endothelial Cells of Host Origin

Student
Dania Wahl
Major
Biomaterials
Title
Anomalous Liquid Wetting of Roughened Ceramic Surfaces

Student
Ariana Young
Major
Psychology
Title
The Influence of Social Consensus Information on Body Image and Appearance Attitudes
Student presenters were nominated by their Deans to participate in today’s Celebration of Academic Excellence. Each decanal area was asked to go through their own selection process and supply a limited number of undergraduate student works. In limiting the number of student presentations from the various undergraduate schools, a wide variety of scholarly and creative works was able to be showcased. During this poster session we celebrate UB’s undergraduate students and their faculty mentors who are engaged in innovative work and scholarly research. The nominated student works you are viewing are stellar examples of the undergraduate research opportunities available to UB students. Thank you for joining us today as we “Celebrate Excellence” in undergraduate research and creative works.