Sixth Annual

Celebration of
Academic Excellence

Thursday, April 1, 2010
Center for the Arts
**Title**

**Arrangements Through Light**

**Abstract**

The arrangement of space through lighting, a series of cone shaped apartment units stacked upon one another were created to funnel light into the spaces. Spaces within the units are placed by necessity of light. Spaces like closets and bathrooms do not require natural light and as such are placed in the rear of the unit while spaces like the living room and kitchen are placed in direct lighting at the front of the units. The spaces start at a narrow dark entry then open up into a direct lit large space at the front. The units have a double glazing system that separates the outdoor balcony, indoor greenhouse, and indoor space. The double glazing acts as a control for air movement able to control temperatures within the unit itself and within the greenhouse. There are on the upper half of the glazing systems a series of operable louvers which were placed to control lighting intensities within both spaces as well.

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**Student**

**Ryan Kucinski**

**Major**

Environmental Design

**Research Mentor**

Alex Bitterman, Ph.D.

**Title**

**Buffalo's Changing Landscape: the Former AM&A's Department Store**

**Abstract**

The City of Buffalo is a shadow of its former grandeur at the turn of the 20th century; struggling to find itself in the 21st century, struggling to find itself in the 21st century. This struggle is most evident in the number of buildings that remain unused in the heart of Buffalo's downtown central business district. Issues related to the vacant buildings are heightened as the structures have architectural and historical significance to the city, in addition to being located on some of Buffalo's primary arterial corridors. While these buildings once fostered walkable neighborhoods and attracted people to the city, they now only add to the blight and negative image of downtown Buffalo. One building that showcases all of those elements is the former AM&S’s department store located on Main St. in downtown Buffalo. My research looks across time at the former AM&A’s building and its larger impact on the City of Buffalo. If we understand where we once were, as well as are now, we can plan and design a better future.

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**Student**

**Patrick K. Connolly**

**Major**

Architecture

**Research Mentor**

Sergio Lopez-Pineiro, M.Arch.

**Title**

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**Student**

**David Jacobi**

**Major**

Environmental Design

**Research Mentor**

Alex Bitterman, Ph.D.

**Title**

**Buffalo's Landscape: The Buffalo Zoo**

**Abstract**

The Buffalo Zoo, located in Buffalo's F.L. Olmstead-designed Delaware Park, is a significant public attraction in the Buffalo Niagara region. A precedent study was concluded by examining the history of the Zoo and on-site fieldwork through a visit to the Buffalo Zoo. As part of the research, visual documentation of the Zoo’s site conditions were gathered, current and future plans were examined, and a public information campaign was created to promote the Zoo’s educational mission to the widest part of the population within the larger Buffalo Niagara metropolitan area.

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**Student**

**Nicole Lee**

**Major**

Architecture

**Research Mentor**

Professor Annette Lecuyer

**Title**

**Unprescribed Dwellings**

**Abstract**

The idea of what is public and private space is highly subjective depending on age, time and culture. Specifically in space within its contextual environment, the objective for my design work has been to evoke provocative spatial relationships which engage complex geometric form. Manipulation of a person’s perception of space is one of the most powerful tools an architect has at their disposal. A person’s immediate reaction to a space becomes this perception. Spatial perception provides cues, such as depth and distance that are important for movement and orientation within an environment. How these perceptions are mediated, is what the architecture becomes. Developing complex geometric form both on the interior and exterior, which is then engaged by a diverse set of users, provides for a dynamic building-occupant relationship. In my work the abstraction or manipulation from architectonic typologies through complex geometric form, is one way I choose to progress building-occupant relationships.
The goal of urban housing should NOT be to convince suburbanites to live a city life, but rather to bring the BEST parts of the suburbs into the urban environment. It is possible for EVERY amenity and convenience of the suburbs to be present and attractive within an urban setting. By combining the elements of suburban life that Americana holds so dear, from the back yard to the dog house, with the location, efficiency, and attractions of a city, a vehicle for the future of urban living can be found. Considering the decaying nature of many urban centers around the world, this project strove to investigate one potential solution to society’s greatest obstacle, how can you bring people back into the urban environment.

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China, the street front is an extension of the home, the sidewalk a place for cooking, playing games and hanging laundry. All of these informal, opportunistic appropriations of space occur within the city limits of high density, creating a new array for spaces of unsupervised program. A mixed use building was proposed for downtown Buffalo at the intersection of a major civic artery and a street known for its nightlife. The apartments are organized as a series of layers parallel to the street. The main living area consists of open plan spaces articulated by changes of level and heights open for the desired use of the resident. Translucent channel glass allows for privacy, while outdoor balconies and windows allow for natural sun lighting and ventilation.

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As the obesity epidemic grows, Urban Planners are increasingly turning to public parks as a resource for promoting physical activity. Research proves that parks are one of the most important factors in promoting physical activity. However, this is not because of their presence or accessibility as many have claimed, but because of their physical design. The actual features of parks that are most conducive to physical activity are not completely understood. Additionally, few have considered the role of demographics. A careful case study and analysis of two Buffalo parks in comparison to the populations of their surrounding neighborhoods demonstrates how many parks are not suited to meet the needs of their communities, and are not conducive to physical activity. Using research from this developing field, a careful study of neighborhood demographics, and site visits to local parks, recommendations for redesign can be made that apply to parks around the country.

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The Amherst Theatre, located in Buffalo’s University Heights neighborhood, was built in 1941 and is part of a collection cinemas owned by Dipson Theatres. Dipson Theatres is a locally owned corporation that purchases small old theatres and uses them to show local and international art films, and currently owns 15 theatres in the Buffalo Niagara region. The Amherst Theatre has a long history and is known for holding organizing meetings for students that orchestrated riots in the 1960’s held on the University at Buffalo’s South Campus. The Amherst is also known for showing controversial films like “The Celluloid Closet” and “Last Seduction.” The interior of the Amherst was destroyed by in 1994 for unknown reasons. In November 1996, Benderson Development purchased University Plaza where the Amherst is located and renovated the Amherst Theatre along with the rest of the plaza and remains one of four original buildings located within the plaza site. Today the Amherst is still an active theater and shows a mix of independent art films along with the most recent Hollywood productions.

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Examines the history of Buffalo’s Sisters of Charity Hospital from its original location in the historic Allentown neighborhood to its current campus on Main Street. Explores the areas of excellence Sisters of Charity Hospital has developed in critical care areas including cancer treatment, stroke research, and the top ranked Center for Bariatric Surgery in the State of New York.

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We show how the organic compound quercetin down regulates the expression of heat shock protein (Hsp) 70, 60 and 40 in both heated (stressed) and physiological conditions. Using real time PCR, we analyzed the expression of several genes, including Hsps, heat shock factor (Hsf) as well as apoptosis marker, caspase 3.

Our research shows that quercetin hyper sensitizes cancer cells to heat and other stresses, making it an interesting candidate for cancer therapies. Further research is needed to study the effects of the down regulation of Hsps have on the cancer cells’ survival rate in vitro, the interesting down regulation of Hsf-2 and its implications on quercetin’s drug action and the implications of the up regulation of caspase 3 and its effect on cell death.

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nutritive function of large buttress roots for tropical trees. Data was collected during the beginning of the dry season in a primary forest near the ITEC Biological Station, Bocas del Drago, Isla Colon, Panama in winter 2010. Leaf litter samples were collected from between large buttress roots, as well as from nearby areas of open forest floor (referred to as “non-buttressed areas”). Leaf litter mass, moisture content, and invertebrate biodiversity and species richness were compared between both sample groups. Although the two areas did not show significant differences in any of the variables measured, invertebrate species composition did vary to an extent.

Students
Amanda Bossard, Shana King, JoAnn Pan

Major
Communication

Research Mentors
Dr. Mary Cassata, Joseph M. Sirianni

Title
Information-Seeking Habits of Young Adults With Regard to Sexual Health

Abstract
The Center for Disease Control (Center for Disease Control 2009) has revealed that, despite the efforts of health campaigns and health education throughout the nation, the spread of Sexually Transmitted Diseases and Infections remains on the rise. There exist around 1 million reports of Chlamydia, gonorrhea, or syphilis in youths ages 10-24. With 45 percent of women ages 20-24 infected with the human papillomavirus and the majority of new HIV infections also occurring within this age range, there is clearly a cause for concern.

Our research seeks to discover the channels through which young people are accessing information about STDs and STIs. It is our expectation that the majority of information gained about sexual health will be sought on the internet. Because of the influential role the mass media play in society, understanding the psychosocial mechanisms through which symbolic communication influences human attitudes and behavior, is of considerable importance. Social cognitive theory provides a conceptual framework within which to examine the determinants and mechanisms of such effects.

Data will be collected through a self-administered questionnaire of first year college students based on their information-seeking habits with regards to sexual health information.

Students
Lonnie Camacho, Calvin Boomer-Knapp, Taylor Hammen, Taylor Martin, Jane Park, Winnie Lei, Julie Ficarra, Charnell Lewis, Ashley Greuschol, Kevin Bryant

Research Mentor
Dr. W. T. Carter

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

Abstract
The purpose of the survey is 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 results will be compared to similar studies that have been conducted over the years to determine the level of improvements between the present and past generations. Interviews will be conducted to verify the results of the written surveys.

Student
Li Hua Chen

Major
Biological Sciences

Research Mentor
Dr. Rosemary Dziak

Title
Nano-calciu sulfate-a scaffold for delivery of growth factor in bone regeneration

Abstract
This nano-calciu sulfate(nCS)fabricated by graduate student, YoungBum Park, has tremendous potential for use as a scaffold and/or vehicle for delivering growth factors for bone regeneration in a variety of clinical situations. Nano materials enhance physical properties, such as increase surface area for growth factor adsorption, and improve mechanical strength and resistance to fracture. The objective of this project is to measure bone formation with microCT around a dental implant after a newly formulated nCS material has been applied to a site that has been previously grossly deficient in bone. It was revealed that the nCS with PDGF treatment group had more mineralized tissue formed, than the
control group although the differences were not statistically significant. nCS is a desirable vehicle and scaffold for delivery of Growth Factors such as PDGF to osseous defect sites to stimulate bone regeneration. Further studies are needed, however, to optimize the conditions.

Students
Kyle Drozenski, Lindsay King, Brian Smith
Major
Communication
Research Mentor
Dr. Mary Cassata, Joseph M. Siriani
Title
The Relationship between Violent Rap Lyrics and Aggressive Thoughts or Behavior
Abstract
This study was conducted to test the effects of media violence, in the form of violent rap lyrics, on aggressive thoughts or behavior. During the study, aggression was defined by four characteristics: physical and verbal aggression, anger and hostility. Participants were given a questionnaire consisting of 29 questions in order to assess baseline aggression. Seven to ten days later, participants listened to a rap song containing violent lyrics. Immediately after, they were asked to fill out the same 29 question questionnaire. According to previous research and the General Aggression Model, the results are expected to reflect that aggressive thoughts or behavior significantly increase after being exposed to violent media.

Student
Kathryn Drzewiecki
Major
Bioinformatics
Research Mentor
Dr. James Berry
Title
Effects of Pharmaceutical Contaminants on Plant Development
Abstract
My project examines the effects of an environmental contaminant, the veterinary antibiotic Chlortetracycline (CTC), on plant growth and development, using the model plant systems arabidopsis and tobacco. My research has shown that arabidopsis plants show sensitivity to this antibiotic, with reduced growth and other effects. Additional studies have shown that arabidopsis does not detoxify (break down) this antibiotic following uptake from the roots. Experiments with tobacco are ongoing. CTC is a known calcium chelator, and previous studies demonstrated that in some plants, intracellular calcium is reduced when CTC is taken up from antibiotic treated soil. I will use transgenic plants expressing a cameleon protein (which changes fluorescence properties in response to calcium levels) to determine if reduced calcium relates to CTC toxicity in these model plants. These plants will be treated with CTC and other known calcium-affecting chemicals, to determine the relationship between calcium levels and toxicity from pharmaceutical contaminants.

Student
Michael Fay
Major
Geography
Research Mentor
Dr. Sean J. Bennett
Title
Turbulence Modulation by Suspended Sediment Within a Mixing Box
Abstract
The effect suspended sediment can have on turbulent flows remains ambiguous primarily because it is difficult to discriminate the fluid phase from the sediment phase within a turbulent, sediment-laden flow. To address this issue, experiments are being conducted using a standard mixing box with both clear-water and sediment-laden flows, and the turbulent flow field is quantified using a Particle Image Velocimetry laser system. Neutrally-buoyant fluorescent pink particles are being used to act as fluid seed particles. Both the total flow volume and the oscillation frequencies within the box are being carefully measured and monitored, and known concentrations of sediment are being added incrementally. Preliminary data indicates measurable modifications to the turbulent flow field, as a result of the suspended sediment. This information will be used to assess the effects sediment transport can have on the turbulent characteristics in a variety of geophysical flows.

Student
Julie M. Ficarra
Major
Anthropology & International Studies
Research Mentor
Dr. Phillip Stevens
Title
Educational Experiences and Outcomes of Burmese Karen and Somali Bantu
Abstract
The purpose of this study is to investigate the educational experiences and achievement of two refugee groups, the Somali Bantu and the Burmese Karen living in Buffalo, NY. My library research has involved surveying the available ethnographic literature on each group as well as other studies that have been conducted on refugee and SIFE (Students with Interrupted Formal Education) education. I have interviewed both Bantu and Karen refugees regarding their attitudes towards education, refugee service specialist from 3 different agencies regarding the educational services/options they provide, as well as ESL teachers and Buffalo City School District administration regarding the difficulties involved in providing quality education to refugee learners. My goal has been to attain a deeper understanding of refugee educational experiences and use an ethnological approach to uncover an weaknesses in the 'refugee education pipeline' and provide suggestions for improvement.

Student
Lori D. Glantz
Major
Sociology

= University Honors Student  = CURCA Funded Project
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Increasingly Asymmetric Theatre.

The IDF: Trials and Tribulations in an

An Analysis of Neighborhood Perceptions among Residents of Spatially Isolated and High Poverty Areas

Abstract
Racial residential segregation has important consequences for individuals and families. Previous research has documented the ways in which spatial location influences one’s life chances due to differential access to opportunity structures. However, relatively little is known about the perceptions of residents who live in spatially isolated neighborhoods that have high levels of poverty.

Student
Scott Goosenberg

Major
Sociology and Political Science

Research Mentor
Dr. Mark Gottdiener

Title
The IDF: Trials and Tribulations in an Increasingly Asymmetric Theatre.

Abstract
"Is it not fundamental to any pursuit of justice, whether based primarily on theology or secularly guided moralistic principles, that impartiality remains a guiding virtue to deduce the culpability of a defendant? Historically, this has not been the case when Israel is under the scope, whose military actions are scrutinized to an arguably egregious degree. This analysis aims to understand the role that contextual geo-political factors have functioned in temporally altering the I.D.F. paradigm, and how these variables have had a causal influence in terms of meeting explicit operational objectives.

Concurrently, the circuitous dynamic so pervasive to the I.D.F. ethos will be illustrated. That is to say, how have exogenous and endogenous considerations alike modified the mentality and actions of the I.D.F.? In turn, how if at all has public opinion shaped how the I.D.F functions and causally impacted future endeavors? Finally, how does International Law apply to asymmetrical warfare against non-state actors? On a case-by-case basis, this analysis seeks to ascertain the role this seemingly reflexive dynamic has played in facilitating changes in the Israeli military establishment.

Areas Spatially Isolated and High Poverty Perceptions among Residents of

An Analysis of Neighborhood

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Student
Marissa Green

Major
Psychology

Research Mentor
Mark D. Seery, Ph.D.

Title
Physiological Responses Under Conditions Of Stereotype Threat

Abstract
One of the most pressing consequences that targets of negative stereotypes often face is stereotype threat—discomfort resulting from the knowledge that one’s performance could confirm the negative stereotype. The purpose of this project was to gain a more thorough understanding of the psychological experience that occurs during stereotype threat, which may contribute to performance differences seen between Blacks on Whites on standardized tests such as the SAT and GRE. To test this, we assessed physiological responses of Blacks and Whites during situations involving stereotype threat (while taking a portion of the GRE test), in which racial stereotypes were activated versus not. Results revealed cardiovascular responses consistent with differential evaluations of resources and demands among Blacks, such that Blacks experienced a more negative response when racial stereotypes were activated versus not.

Student
Chelsey Hartley

Major
Psychology

Research Mentor
Dr. Julie Bowker, Dr. Wendy Quinton

Title
Best Friendship Dissolution During Early Adolescence: A Focus on Relationship Quality

Abstract
This study examines best friendship dissolution in adolescents. Participants were 194 adolescents (100 boys) in the eighth grade from one private, co-educational secondary school in Surat, India (M age=13.35 years, SD = 1.09). Participants reported on their past experiences with (1) complete dissolutions (when friendship ties are completely severed), and (2) downgraded dissolutions (when the youth become “good” friends instead of close best friends). Participants also reported on emotional reactions (sadness, anger, or happiness) to both types of dissolution and best friendship replacement. Finally, participants reported on social support from parents and current friendships. To determine the most common emotional reaction to both types of dissolution a series of paired t-tests were conducted. To determine if friendship replacement buffers adolescents from the loneliness associated with dissolution two 2 x 2 x 2 ANOVA analyses were performed. To determine whether having an existing high quality friendship or parent-child relationships buffers an adolescent from experiencing loneliness following best friendship dissolution, four hierarchical linear regression analyses were performed.

Student
Chelsey Hartley

Major
Psychology

Research Mentor
Dr. Julie Bowker

Title
Examining Best Friendship Dissolution in India

Abstract
Conditions Of Stereotype Threat

Physiological Responses Under

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Psychology

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Abstract

Losing a best-friend is a significant interpersonal stressor during adolescence. However, previous research on dissolution is limited by an almost exclusive focus on complete dissolutions (when friendship ties are severed). Only one study investigated downgrade dissolutions (when best-friends become “good” friends; Bowker, 2010). In addition, all research has been conducted only in the North America. The goals of this study were to extend the Bowker (2010) study by examining both types of dissolutions during adolescence in India. Participants were 194 8th grade students from Surat, India who reported on past dissolutions experiences, loneliness, and social support. Similar to Bowker (2010), downgrades were found to be more common than complete dissolutions (60% versus 45%). However, unlike Bowker (2010), there were no sex differences in the likelihood of experiencing both types of dissolution. Additional analyses will examine whether supportive parent and friend relationships alleviate the loneliness associated with both types of dissolution.

Student
Bridget Hughes

Major
Psychology

Research Mentor
Dr. Julie Bowker

Title
Effect of Positive Characteristics on the Peer Relationships and Loneliness of Overweight Middle School Students

Abstract

Being overweight is a risk factor for a myriad of social and psychological difficulties during adolescence. However, not all overweight adolescents experience psychosocial difficulties, thus it is important to investigate possible moderators of the associations between body mass index scores (BMI) and adjustment problems. This study is the first to consider humor and perceived intelligence as possible moderators. Participants were 64 sixth-grade students who reported their loneliness, height, and weight, and who completed a peer nomination measure assessing humor, perceived intelligence, peer acceptance, and rejection. Results from regression analyses and follow-up tests indicated that being perceived as humorous protects overweight adolescents from loneliness, but perceived intelligence increases peer difficulties. For instance, there was a negative correlation between BMI and peer acceptance, but only for adolescents perceived as “smart” (p < .05). A good sense of humor may help overweight adolescents cope with their difficulties whereas scholastic ability may increase difficulties.

Student
Melissa Judson

Major
Physics

Research Mentor
Dr. Hong Luo

Title
Conference for Undergraduate Women in Physics at Yale (CUWPY)

Abstract

CUWPY is a professional conference with the main goal of networking women in physics. The conference allows for undergraduate women (specifically in physics) to attend a professional conference and not only meet with other physics undergrads, but grad students from across the country, as well as hear speeches from women currently in the professional field. I attended this year’s CUWPY on January 15-17, and took notes on my experiences there and on the presentations that I viewed.

Student
Kristina Krylova

Major
Physics

Research Mentor
Dr. Hong Luo

Title
The Standard Model of Particle Physics and the Search for the Higgs

Abstract

In a tunnel that is deep underground beneath the border of France and Switzerland, subatomic particles and heavy nuclei are being accelerated to nearly the speed of light and smashed against each other. This is the world’s most powerful accelerator called the Large Hadron Collider.

Now is a very exciting time for physicists because within a few months, the collider
will start operating at its fullest potential and that is when the physics community hopes to see hints of new physics. One of the things that they will be looking for is a particle that is theorized to give mass to all other particles and has been given the name the Higgs boson.

In my presentation I will give an introduction to particle physics and discuss the importance of the Large Hadron Collider.

Student
Michelle Kuznicki

Major
Biomedical Sciences

Research Mentor
Shermali Gunawardena, Ph.D.

Title
Testing Organically Modified Silica Particles (ORMOSIL) within Drosophila Larval axons

Abstract
In this study we adapted a protocol to inject a novel nanoparticle, ORMOSIL, into larval axons. The movement of ORMOSIL was compared to the movement of synaptic vesicles. Using a transgenic line, we expressed synaptotagmin-GFP and assayed the movement of synaptotagmin vesicles in vivo within larval axons. While synaptotagmin-GFP moved both anterogradely and retrogradely, we failed to see movement of ORMOSIL. To observe ORMOSIL movement we generated an ORMOSIL particle that is conjugated with a peptide. In published experiments, this peptide, when attached to a bead, moved anterogradely. Similarily we propose that ORMOSIL-peptide will also move anterogradely within larval axons. We have evaluated several methods to achieve penetration of ORMOSIL-peptide into larval axons. It is our hope that endogenous motor proteins within Drosophila will recognize this particle and enable movement within larval axons.

Supported by CURCA.

Student
David Lloyd

Major
Psychology

Research Mentor
Jennifer Schneider/ Eduardo Mercado

Title
Sound localization acuity of humpback whales: The effects of azimuth and sound structure

Abstract
Neural Networks were used to analyze the theoretical precision with which a humpback whale (Megaptera noveangilae) can localize sound. These networks are commonly used in computational neuroscience and serve as a mathematical model of the interactions between neurons in the brain. Differences in acuity were found based on the structure and azimuth of the sound. Categories of sound structure included synthetic pure tones, linear frequency sweeps and replayed humpback song recordings. Azimuth angles were varied between 0 and 90 degrees relative to center.

Student
Kelsey Danielle Ludtka

Major
Speech Language Pathology

Research Mentor
Mark D. Seery, Ph.D.

Title
Self-Esteem and Self-Handicapping Behavior: The Role of Underlying Motivation

Abstract
Despite the benefits of high self-esteem (HSE), it is also linked to greater defensiveness. HSE has been associated with using self-handicapping behavior—a defensive strategy—to boost self-esteem by impeding one’s own performance, thus appearing exceptional if successful and excusing failure if not. However, recent research suggests that self-esteem stability in conjunction with level of self-esteem may be particularly important. To further investigate this, we assessed cardiovascular responses that reveal underlying self-doubt and manipulated whether: (1) a test could identify only people with either extremely high or low ability; and (2) a self-handicap was present versus removed. It was hypothesized that relative to those with stable HSE, people with unstable HSE would experience self-doubt when the handicap was removed, but only when the test identified extremely high ability. These results would suggest that people with unstable HSE are motivated by fear that they do not possess exceptionally high ability.
Research shows that group dynamics within small groups of individuals use these tools to collaborate. However, when small groups are exposed to the media that one cannot help but point the finger of blame at the media for causing an epidemic that is destroying so many lives, especially among young women. Studying this topic might help raise the awareness of the general public who believe that media messages are ineffectual in the lives of young people. Hopefully this awareness might stimulate a change in the media world, especially in advertising which uses underweight and malnourished models by replacing them with real women.

In 2010, network infrastructure and computing technology accessible to students and faculty should allow for effortless small-group collaboration within the university setting. The functional and usability limitations of web-based services become apparent, however, when small groups of individuals use these tools to collaborate. Research shows that group dynamics within teams also cause dysfunction.

This qualitative study gathers input from seven undergraduates at the State University of New York at Buffalo in order to gain an understanding of students’ habits, opinions, and usability needs when working together online. Interviews were conducted and transcripts analyzed, with a goal of improving the experience of using the internet as a medium of data exchange and collaboration.

Preliminary results show that participants are hesitant to use the internet to support group coursework. Most have only used email, and to a lesser extent, UBlearns (an implementation of Blackboard Academic Suite) to work with colleagues.

A novel strategy for the control of the crystallite size of magnetite is the subject of this presentation. The hypothesis for this strategy is that since alcohol-water solutions are structured microscopically, then using alcohol-water solutions as solvents for magnetite precipitation might affect magnetite crystallite size. Our study involved the variation of the mole fractions of alcohol-water solutions and the measurement of magnetite crystallite sizes. The results that we have obtained indicate that for methanol-water mixtures, there is a good correlation between alcohol mole fraction and magnetite crystallite size.

Previously we found that mutations of motor proteins, which show axonal transport defects, also show synaptic defects. Axonal transport defects were assayed by using antibodies to synaptic protein while both pre and post synaptic defects were assayed by using antibodies to HRP and DLG respectively. To test if problems in axonal transport lead to synaptic defects we evaluated larvae that had a mutation in a synaptic protein synaptotagmin. We used two loss of function mutations for synaptotagmin, as well as a synaptotagmin over expressing mutation. Synaptotagmin is involved in synaptic vesicle docking to presynaptic membrane, as well as a synaptotagmin over expressing mutation. Synaptotagmin is involved in synaptic vesicle docking to presynaptic membrane, and also synaptic vesicle fusion with presynaptic membrane. Using immunofluorence and antibodies to a synaptic vesicle marker we failed to see axonal defects in both in loss of function and over expression mutants of synaptotagmin. However both loss of function and over expression mutants had defects in synaptic length, synaptic area, and in the number of pre and post synaptic boutons. Our findings suggest that synaptic defects do not cause problems in axonal transport.

This work of creative nonfiction is a creative case study which explores questions of how and to what extent the September Eleventh Terrorist attacks of 2001 disrupted, impacted, and changed the everyday experience of a Staten Island neighborhood, and the then “tween” demographic thereof, through reflection upon the incident 8 years later. Rather than a sociopolitical treatise, this work is a memoir of real human actions without preaching, and without sugar coating. The work bounces back and forth between a “present day” scene
and flashback, incorporating individual memories, dialogue, newsclips, quotations, and other research. It is an experiment in minimalist tone as a means of conveying difficult scenes.

Student
Josh Q. Newman
Major
English
Research Mentor
Prof. Robert Daly
Title
Cormac McCarthy and the Myth of Violence
Abstract
I am writing a 30-35 page thesis on the works of American novelist Cormac McCarthy. He has written such works as “Blood Meridian,” “All the Pretty Horses,” “No Country for Old Men,” and “The Road.” I am researching his impact on American literature and his use of violence in his works.

Student
Phuong-Lan Thi Nguyen
Major
Biomedical Science
Research Mentor
Dr. Shermali Gunawardena
Title
Investigating the biocompatibility of a new nanoparticle (Ormosil) in Drosophila
Abstract
We evaluated the biocompatibility of ORMOSIL (Organic Modified Silicate particles) a new class of nanoparticles in vivo in Drosophila. We first tested the lethality of ORMOSIL by performing feeding experiments at different ORMOSIL concentrations. We find that ORMOSIL does not harm or cause any side effects to Drosophila since we failed to see lethality during larvae, pupae or adults compared to control feedings. Furthermore, we found ORMOSIL particles in adult brains indicating that ORMOSIL can incorporate into neural tissues. We next investigated ORMOSIL in primary neuronal cultures generated from larval brains. We find that ORMOSIL readily incorporated into the cell bodies and into axonal projections. We are currently investigating if ORMOSIL interferes with the normal transport of components within the axon using live analysis in primary larval neuronal cultures.

Student
Kelly Norman
Major
Psychology, Spanish
Research Mentor
Dr. Julie Bowker
Title
Rejection Sensitivity and Psychological Difficulties: Examining the Moderating Role of Friendship Involvement
Abstract
It is clear that rejection sensitivity is a strong risk factor for internalizing difficulties during adolescence. Little is known however about the importance of having friends in the lives of rejection sensitive adolescents, a research gap that is surprising given evidence that friends can be especially helpful for adolescents who are at-risk for internalizing problems. The purpose of this study was to examine friendship involvement as a moderator of the associations between rejection sensitivity and psychological adjustment. Participants were 150 7th grade students who reported on rejection sensitivity, social anxiety, and self-esteem. Participants also identified their close friends, and mutual (or reciprocated) friendships were determined. Results from hierarchical regression analyses revealed that rejection sensitivity was a stronger predictor of social anxiety for those adolescents with no mutual friend than those with a mutual friend. These results strongly suggest that friends may protect rejection sensitive adolescents from some psychological distress.

Student
Niraj C. Patel
Major
Biomedical Sciences
Research Mentor
Mark D. Seery, Ph.D.
Title
The Motivational Consequences of Derogation Among Individuals with Discrepant High Self-Esteem
Abstract
Evidence suggests that people with the combination of high explicit self-esteem and low implicit self-esteem (discrepant HSE) may engage in weight discrimination as a defensive response to self-threat. However, it is not clear how the chance to derogate versus not after a self-threat affects individuals with discrepant HSE. Specifically, it may make them more confident about themselves during a subsequent task. To test this idea, we applied the biopsychosocial model of challenge and threat (Blascovich & Tomaka, 1996) and measured cardiovascular responses. Participants received failure feedback on a test of reasoning ability and were either given the opportunity to derogate a stigmatized other or not. We expect that among individuals with discrepant HSE, those who get the chance to derogate will exhibit challenge (a positive motivational state consistent with confidence) during the second task, whereas those who do not have the opportunity will exhibit threat (a negative motivational state).

Student
Peter M. Pfaff
Major
Pharmacology and Toxicology
Research Mentor
P. Michael Terlecky, Ph.D.
Title
A Study of the Impact of Deicing Chemicals on Bizer Creek
Abstract
This project involved the study the potential impact of deicing chemicals
on Bizer Creek from the University at Buffalo’s North Campus in Amherst, New York. Bizer Creek is parallel to Sweethome Road and runs along the west side of the North Campus and discharges to Ellicott Creek. Bizer Creek is also a discharge point for storm water draining from parking lots, walkways and buildings. The runoff includes the most common deicing chemical, roadsalt (Sodium Chloride (NaCl)). The study consisted of a 10-week sampling and analysis period, hydrogen ion concentration (pH), conductivity and concentration of sodium were measured for two locations on Bizer Creek.

Student
Maria Piddoubny

Major
Pharmacy

Research Mentor
Dr. Scott Medler

Title
Hybrid Muscle Fibers in Developing Mice

Abstract
Our knowledge of the way in which muscles develop at the whole-muscle level has been refined, however, these changes have still not been precisely explained on a single fiber scale. There are two main classifications of fiber types: slow and fast. Fibers are more precisely classified by the isoforms of the motor protein myosin heavy chain (MHC) than express I, IIA, IIX, and IIB fibers. While it is known that muscles in their entirety are a mosaic: consisting of both slow and fast fibers, this study looks to improve our understanding how the precise make up of single fibers changes over the course of development. In particular, we are interested in single fibers that co-express multiple MHC isoforms, known as hybrid fibers. In the current study, we report the presence of single fibers within the soleus muscle of young mice that co-express unique combinations of MHC.

Student
Jaclyn M. Russo

Major
Psychology

Research Mentor
Dr. Julie Bowker

Title
Examining The Stress and Psychological Impact Associated with Complete and Downgrade Friendship Dissolutions

Abstract
Best-friendship dissolution is a significant risk factor for psychopathology during early adolescence. Most researchers focus on complete dissolutions (when the friendship ties are severed), and little is known about downgrade dissolutions (when the best-friendship becomes a good friendship). This study was designed to extend the literature by investigating whether stress associated with complete and downgrade dissolutions is related to emotional reactions about dissolutions and psychological well-being. Participants were 150 7th grade students who reported on friendship dissolutions, stress, emotional reactions, social anxiety and self-esteem. Analyses revealed significant associations between stress about angry and sad emotional reactions to both types of dissolutions (ps < .001). Downgrade stress was associated with two types of social anxiety (ps < .01) and self-esteem (p < .001) whereas complete dissolution stress was only associated with self-esteem (p < .02). Results suggest that the stress associated with downgrades may be especially detrimental to psychological adjustment.

Student
Jennifer Sander

Major
Psychology

Research Mentor
Dr. Julie Bowker

Title
How the Internet is Affecting Adolescents: A Look at Internet Use, Self-esteem, and Social Anxiety.

Abstract
Being rejected and victimized places adolescents at risk for internalizing difficulties. It has been suggested that adolescents who experience such problematic peer relationships off-line may cope by and benefit from going online. However, no researchers have tested this hypothesis, which was the primary goal of the present study. Participants were 150 7th grade students who reported on their internet use, self-esteem, and social anxiety. Peer nomination data on rejection and victimization was also collected. A number of significant findings emerged, including a significant interaction between rejection and time spent online when predicting fear of negative evaluation (a specific type of social anxiety). Follow-up analyses revealed a negative correlation between rejection and fear of negative evaluation, but only for those who spend five or more hours online per week. Additional analyses will examine the participants’ motives for going online, as well as the specific activities that they engage in while online.

Student
Jonathan Schuster

Major
Mathematical Physics

Research Mentor
Dr. Gino Biondini

Title
Efficient numerical methods for computing failure rates in optical fiber transmission systems

Abstract
Failures in many industrial systems are extremely rare by design and are consequently difficult to predict. We develop an adaptive variance reduction technique that combines Monte Carlo simulations, importance sampling and the cross entropy method, and we implement this method on the supercomputers of the Center for Computational Research (CCR) to efficiently compute birefringence-induced failure rates in optical fiber transmission systems.

Student
Julien Hou

Major
Mathematical Physics

Research Mentor
Dr. Gino Biondini

Title
Optical Fiber Transmission Systems: A Look at Failure Rates and Adaptive Variance Reduction Techniques

Abstract
Efficient numerical methods for computing failure rates in optical fiber transmission systems are extremely rare by design and are consequently difficult to predict. We develop an adaptive variance reduction technique that combines Monte Carlo simulations, importance sampling and the cross entropy method, and we implement this method on the supercomputers of the Center for Computational Research (CCR) to efficiently compute birefringence-induced failure rates in optical fiber transmission systems.
Student
Egle Sirvaityte
Major
Anthropology
Research Mentor
Ann McElroy, Ph.D.
Title
Experiences and Perceptions of Healthy Lifestyles and Weight Management

Abstract
The Center for Disease Control and Prevention reports that over 1/3 of adults in the US are obese and about 2/3 are overweight. Since 1980, obesity rates for adults have doubled and rates for children have tripled (CDC). Excess weight gain increases risk for numerous chronic diseases, such as diabetes, cardiovascular disease, and hypertension. As these diseases are expensive and reduce quality of life, it is important to find a solution, however, the problem is more complex than it first appears. Obesity is largely a behavioral problem, and attempts at health education have largely failed; obesity rates are still increasing. To understand the disconnect between education and self-implementation, I will interview ~40 obese/diabetic patients at a medical clinic in Buffalo to ask what health education they’ve received, what they’ve been able to apply, and what difficulties they’ve encountered, to assist the clinic in improving the effectiveness of their health classes.

Student
Ryan J. Undercoffer
Major
Philosophy
Research Mentor
James R. Beebe, Ph.D.
Title
A Global Approach to Semantic Intuitions: A Reply to Macherey e al.

Abstract
In “Semantics, cross-cultural style,” Machery et al. argue that their own research, which suggests Westerners are more likely to report a causal-historical view of naming than East Asians, is prima facie evidence that semantic intuitions vary from culture to culture. We argue, based on an alternative interpretation of their results, as well as our own, much larger study, that the causal-historical view of naming is actually the dominant view in both East Asia and the West. This suggests that the variance form culture to culture may be weaker than implied by Machery et al. We also studied how other demographic differences affect semantic intuitions across cultures.

Student
Yi Yang
Major
Pharmacy
Research Mentor
Scott Wersinger, Ph.D.
Title
Impaired Performance on a Test of Working Memory in a Mouse Model of Schizophrenia

Abstract
Working memory is impaired in humans with schizophrenia, most likely as a result of disruption of brain dopamine (DA) systems. Brain DA systems of a line of genetically modified mice (TK- mice) are disrupted in a manner similar to that reported in humans with schizophrenia. The validation of this animal model of human schizophrenia is the purpose of this study. This experiment tested the hypothesis that working memory is impaired in TK- mice. To test this
C-STEP PROGRAM (COLLEGIATE SCIENCE AND TECHNOLOGY ACHIEVEMENT PROGRAM)

Student
Nana Asare

Major
Biomedical Science

Research Mentor
Dr. Randall Rasmusson

Title
Timothy Syndrome

Abstract
Timothy Syndrome is a multi-organ dysfunction caused by a Glycine to Arginine substitution at position 406 of the Human CaV1.2 (L-type)Channel. The mutation happens at the intracellular side of the S6 membrane spanning alpha helix in domain I of the voltage dependent gated CaV 1.2 channel which causes a defect in expressed calcium current. In humans, the Timothy Syndrome phenotype shows severe arrhythmias that are thought to be triggered by impaired open state voltage inactivation. Using mice which had the timothy syndrome knock in mutation as a model, we analyzed the relative gene expression levels of the calcium channel, suggesting that triggered cell death (apoptosis) or cell proliferation was not triggered by the increase calcium influx caused by TS mutation.

Student
Jessica Gyemibi

Major
Psychology

Research Mentor
Dr. Scott Wersinger

Title
Maternal Behaviors in Timothy Syndrome Mice

Abstract
In this experiment, I will compare Maternal Behaviors in two types of mice, normal mice and mice with Timothy Syndrome (TS). TS is a rare genetic disorder caused by Calcium overload and characterized by multi organ dysfunction including cognitive abnormalities, lethal arrhythmias, webbing of fingers and toes, congenital heart disease, immune deficiency, intermittent hypoglycemia and autism spectrum disorders. Twelve female mice consisting of TS mice and wild types (normal) as controls will be paired with male mice and I will observe subjects behavior towards litter after delivery. Using three separate types of tests, undisturbed observation, retrieval and separation test, I will observe maternal behaviors.

Student
Ron Heichman

Major
Aerospace and Mechanical Engineering

Research Mentor
Puneet Singla, Ph.D

Title
Development of Virtual Testing Platform for Evaluation of UAV Quadrotor Control and Command Algorithms and Programs

Abstract
Before applying a program or control scheme to the small quadrotor helicopters used in the Laboratory for Autonomous Intelligent Robotic Systems (LAIRS) it is important to test this control scheme for flaws without possibly causing irreparable harm or incurring expenses for damages to the quadrotors. The method in development to achieve this goal is MATLAB-based SimMechanics model which mimics the quadrotor’s physical properties dynamical for arbitrary forcing, this experimental platform would allow anyone who designs a control scheme to test it in a virtual environment before implementing it on the physical quadrotor, which will save time and possible damage.

Student
Corinna Joseph

Major
Aerospace Engineering And Mechanical Engineering

Research Mentor
Andrew Olewnik, Ph.D.

Title
Research on Mass Customization of Consumer Products – Concentration: Computer Mouse

Abstract
As an objective, I was to develop CAD models with the aid of design software (SolidWorks) for consumer products that give consideration to aspects of mass customization. I formulated new designs that rely on consumer specific input to vary the system in function and form. After reviewing many literatures on mass customization and parametric modeling, information was gathered and put into effect when new design strategies were implemented. Consumer goods and their consecutive functions/attributes, which could benefit significantly from mass customization strategy, were identified. Computer mouse was chosen as the products for the time being. A 3D CAD model of the product was developed. The research is now being developed to include consumer input by having focus groups and surveys. The design will be modified through the use of consumer input gathered.
Student
Jonathan Rivera

Major
Civil Engineering

Research Mentor
Andrew Whittaker Ph.D, S.E.

Title
Behavior of Squat Walls Under Lateral Loads

Abstract
Reinforced concrete squat walls have aspect ratios (height-to-length) less than two. These walls are important structural elements because they are designed and detailed to withstand the lateral loading that may be imposed on a wall during an earthquake. The concrete building code requires practicing engineers to design and detail squat walls as a flexural wall (aspect ratio greater than two). The ACI formula, as well as others, to determine peak shear strength does not accurately predict the behavior of a squat wall. This inability to predict the behavior of squat walls is unacceptable with today’s methodologies and technology. To remedy this research is being conducted at the University at Buffalo, University at California, Berkeley, University of Washington, and Cal Poly San Luis Obispo, which includes large-scale testing and numerical analysis.

Student
Yanlin Wang

Major
Pharmaceutical Science

Research Mentor
Dr. Qing Ma

Title
Tobacco and Marijuana Use Decreases Atazanavir Concentrations in HIV Infected Patients

Abstract
Background: Atazanavir (ATV), a substrate of CYP3A5, is a protease inhibitor widely prescribed for HIV treatment. The primary objective was to evaluate the influence of tobacco/marijuana use on ATV concentrations in HIV+ patients. The impact of CYP3A5 genotypes was also evaluated.

Methods: 66 HIV+ individuals with (n=31) or without (n=35) tobacco/marijuana use on ATV-containing regimens were enrolled. The association between ATV concentrations, CYP3A5 6986A>G genotypes and tobacco/marijuana use was evaluated using Kruskal-Wallis test and linear regression.

Result: Based on CYP3A5 genotypes, the patients were categorized as extensive (AA/AG, n=35) and slow (GG, n=31) metabolizers. Significantly lower ATV concentrations (mcg/ml) were noted in tobacco/marijuana users (mean: 0.483 vs. 0.969, p<0.01). The CYP3A5 genotypes had no significant impact on ATV levels (AA/AG 0.762 vs. GG 0.724).

Conclusion: Tobacco/marijuana use significantly decreases the plasma concentrations of ATV in HIV+ patients. Further study could be performed to examine the environmental-genomic interactions.

SCHOOL OF ENGINEERING & APPLIED SCIENCES

Student
Alex J. Borsuk

Major
Mechanical Engineering

Research Mentor
Robert E. Baier, Ph.D., P.E.

Title
Emissions Testing of a Modified Diesel Automobile Fueled with Straight Vegetable Oil

Abstract
Tailpipe emissions data was collected on-road in a modified diesel automobile fueled with straight vegetable oil and petroleum diesel fuel. Straight vegetable oil, as discussed in this report, is not biodiesel, the more popular ester-based fuel that can be produced from vegetable oil through a chemical process. Straight vegetable oils are lipid materials that can be obtained from virgin sources or as a waste product and are lipid materials that can be obtained from virgin sources or as a waste product. From these sources, low current will be generated from the solar panels, it can still meet the requirements for charging Nickel based batteries. Low current will cause a slow charge time and thus reducing the chance of a system from overheating, and so this system requires less monitoring. This technology can be useful as an outdoor docking station for portable electronics.

Student
Colin Lea

Major
Mechanical Engineering

Research Mentor
Dr. Venkat Krovi

Title
Haptics-Augmented User Interaction

Abstract
Haptic interaction uses the sense of touch to augment virtual simulations. I present three methods of haptic rendering for various applications. The first augments an introduction to the field of mechanisms by adding haptic
feedback to the end effectors of two-, four-, and five-bar mechanisms. The feedback allows users to learn about the workspace and manipulability of these devices. The second method of haptic rendering allows users to design on a 2D canvas in efforts to provide an additional level of feedback to their creation. A force map is pre-computed and used to add haptic effects. The final method uses commercial haptic software to generate static and reactive effects on 3D geometries. Imported CAD model data is augmented to constrain user motion and add guidance for enhanced interaction. This is continuing work that will be used to train students on design and simulation of new haptic environments.

Student
Lye Lin Lock
Major
Chemical Engineering
Research Mentor
Dr. Sheldon Park
Title
Heterologously Expressed G-Protein Coupled Receptor in Yeast
Abstract
G-protein coupled receptors (GPCRs) play a critical role as signaling molecules in human inflammatory process. Only little structural information regarding how these receptors interact with their ligands, thus it is difficult to design an effective agonist or antagonists to direct their activities. To account this problem, we study GPCR activation and novel ligands discovery by expressing human GPCRs in yeast. Yeast has been an ideal host for this study as the GPCR pathway is conserved in both yeast and mammalian cells. Our study mainly focused on the chemokine receptors of CXCR1 and CXCR2. Most of the GPCRs were successfully expressed on yeast membrane but their functionality coupled to a reporter activity was relatively low. This chemokine receptors function is measured by using the β-galactosidase assay with their respective ligand, IL-8. With a heterologously engineered yeast system and human GPCRs, we will be able to screen small molecule as well as large molecule for potential agonist and antagonist of GPCRs activation.

However, the presence of hazardous heavy metals, such as cadmium, indium, lead, mercury, etc., in the composition of common QDs has severely limited their use in biological systems owing to toxicity concerns. Therefore, in recent years substantial research efforts have focused on the development of non-heavy metal containing QDs, mainly QDs of silicon (Si). However, synthetic challenges associated with the production of stable Si QDs must be overcome in order to obtain high quality Si QDs appropriate for use as efficient biological probes. Here, it is demonstrated that properly encapsulated biocompatible Si QDs can be used in multiple cancer-related in vivo applications, including tumor vasculature targeting, sentinel lymph node mapping, and multi-color NIR imaging in live mice. Based upon this demonstration, it is anticipated that Si QDs can play an important role in more sophisticated in vivo models, by alleviating QD toxicity concerns while maintaining the key advantages of QD-based imaging methods.

Student
Regina May and Leslie Pierrot
Major
Computer Science & Engineering
Research Mentor
Bina Ramamurthy, Ph.D.
Title
Extracting Information from Large-Scale Data using Probabilistic Methods
Abstract
We are currently studying a variety of methods for extracting useful information from large-scale data present in many environments. The project will demonstrate creative infusion of probabilistic methods into big-data frameworks such as map-reduce and cloud computing for solving mainstream data-intensive problems. We have collected data from two real-world domains: millennial census data from the census bureau and a large collection of documents from the Madoff case. The data was scanned using optical character recognition (OCR) system and was cleansed using classical information
retrieval methods. The corpora generated are then stored on the cloud computing framework offered by Amazon.com. We will demonstrate the innovative application a variety of methods from simple word count (WC) to probabilistic methods such as latent semantic indexing (LSI) and latent Dirichlet allocation (LDA) to extract information from the large scale data stored on the cloud. This project is partially supported by NSF-DUE-CCLI-grant 0737243.

Student
Kyle P. McHugh

Major
Chemical Engineering

Research Mentor
Dr. Sriram Neelamegham

Title
Control Electronics for Capacitor Powered Robot

Abstract
Sialyl Lewis-X [sLeX] type carbohydrate structures, found on the leukocyte cell surface receptor P-selectin Glycoprotein Ligand-1 (PSGL-1) binds E-/P-/L-selectin expressed on activated endothelial cells during inflammation. Studies of the enzymes/glycosyltransferases involved largely focus on mouse models and the human enzymes involved are as yet unidentified. Thus, experiments were designed focusing on the role of specific human α1,3 Fucosyltransferases (FT-IV, -VII, and -IX) in regulating selectin-ligand formation. Efficient shRNA perturbing FTs were identified using cells stably expressing a FT-GFP construct for each gene in CHO-S cells. The effect of gene silencing on the expression of cell surface markers such as sLeX, Lewis-X [LeX], PSGL-1, and overall fucose expression along with binding assays for E-/P-/L-selectin-IgG binding under static conditions were measured in HL-60 leukocytic cells. Consistent with literature, knockdown in expression and activity of FT-IV and FT-VII resulted in a drastic down-regulation of LeX and sLeX respectively. FT-VII knockdown also showed completely removed E-selectin and partially reduced L-selectin binding function. Interestingly no effect on P-selectin binding was seen with the knockdown of FT-VII, in contrast to mice knockout models. Overall, the study quantifies the contributions of α1,3 fucosyltransferases in regulating cell adhesion in human leukocytes.

Student
Mark Muffoletto

Major
Electrical Engineering

Research Mentor
Dr. Jennifer Zirnheld

Title
Effects of Inductors on Energy Efficiency of Exploding Conductors

Abstract
Research has shown that a transient high-temperature high-density plasma can be formed when a high density current pulse on the order of 107-108 A/cm2 is released into a conductor. Thisphenomenon in which electrical energy is converted into thermal energy in this manner is known as exploding conductor. This research studies the effect of circuit inductance on the energy conversion process. To achieve this goal, air core inductors were designed and integrated into the system. Detailed design of the inductors and their effects are discussed.

Student
Michael Sparks and Erin Kraus

Major
Electrical Engineering

Research Mentor
Dr. Jennifer Zirnheld

Title
Investigation of Geometric Designs to Increase Hold-off Voltage in Polystyrene Insulators

Abstract
When determining the maximum voltage at which a polystyrene (PS) insulator breaks down, there are several factors that need to be considered. Creating an ideal insulator requires the optimization of various aspects, including but not limited to the material composition, surface finishing, position of the insulator with respect to the electric field, and its geometric shape. The focus of this experiment is to ascertain the most favorable geometric design to maximize the hold-off voltage for flashover. Previous experiments have shown that a method of increasing hold-off voltage is by reducing the primary electron emission at the cathode triple junction under high voltage stress. The experiment was performed using four geometric variations of the PS insulator.
and school administrators, through their high school days and eight years beyond high school. The dataset has many questions on familial characteristics and school/college performance measures. Results indicate that daughters seem to be influenced by family structure and family interaction than do the sons. Overall, it would appear that daughters’ chances of college completion are more sensitive to the family’s ability to provide financial support, as compared to son’s.

Student
Nicole Brown

Major
Psychology/Sociology

Research Mentor
Dr. Sampson Blair

Title
Mental Health, Substance Use, and Criminal Behavior: Disentangling the Linkages

Abstract
Substance Abuse, criminal violence, and mental disorders are rampant among American society. Previous studies have consistently demonstrate that these variables have an inter-correlated relationship, yet few have attempted to examine these linkages. Using data from the 2007 National Survey on Drug Use and Health, analyses were conducted to demonstrate the relationship between drug uses, crime, and mental disorders among a sample of young adults between the ages of 18 and 25. Variables such as race, type of drugs used, frequency of drug use, type of mental disorder, and criminal behavior were included. The results clearly indicated that substantial associations exist between the substance use, criminal behavior, and mental well-being characteristics of most respondents.

Student
Kelly Byrne

Major
Sociology

Research Mentor
Dr. Sampson Blair

Title
Gender Difference in College Completion as a Function of Familial Support

Abstract
Gender differences in college completion rates result from the different levels of support received by one’s family. To answer this question, the National Educational Longitudinal Study (NELS) was used. The study followed a sample of eight graders, their parents, teachers

Title
Perception of and Resilience to Pain Among Athletes in the Culture of Athleticism

Abstract
Athleticism is composed of its own beliefs, practices, set of values, and societal characteristics; these qualities make it a culture of its own. Cultures play a big part in how we live, understand the world, and various stimuli. Pain is strongly influenced by biological, societal, and psychological factors. How does the culture of athleticism distort perception of and resilience to pain and pain experiences of athletes? Surveys were made and distributed to gauge how the culture of athleticism affects pain in athletes. Interviews were conducted to grasp a better understanding of the culture of athleticism and the elements involved.

(DEFINITIONS: Culture: the set of values, conventions, or social practices associated with a particular field, activity or societal characteristic.)

Student
Emmanuel Effah-Appiah

Major
Biochemistry, Chemistry

Research Mentor
Dr. Laren Tolbert

Title
FLUORESCENCE QUANTUM YIELD OF HBDI DERIVATIVES

Abstract
In solution, the synthetic Green Fluorescent Protein (GFP) chromophore, p-hydroxybenzylideneimidazolinone (HBDI), shows a significantly lower fluorescent quantum yield than the wild-type GFP. This lowering of fluorescent quantum yield is caused by energy loss pathways by HBDI in the excited state, mainly through rotation of the molecule about the aryl-alkene single bond leading to cis-trans isomerization. To better understand the mechanism of photo-induced isomerization and to make the correlation between the chemical structure of the chromophores and the optical (absorption and emission) properties, a wide array (57 molecules) of synthetic GFP chromophores were studied to observe their steady-state and time-resolved absorption and emission properties.

Student
Andrew J. Porter, Jr.

Major
Psychology

Research Mentor
Dr. John Roberts

Title
Are Goal Specificity and Implementation Intentions Involved In Depression Vulnerability

Abstract
This study was designed to examine goal specificity and implementation intentions among 102 participants who varied on history of depression. We hypothesized that individuals with a history of depression exhibit less specific approach and avoidance goals and less implementation intentions (i.e. plans) compared to their never depressed counterparts. In contrast to predictions, there were no statistically significant differences between currently, previously and never depressed individuals on specificity of approach and avoidance goals or on implementation intentions for either approach or avoidance goals.
Constitutive ER stress signaling in a C. neoformans ccr4D mutant

Abstract
Cryptococcus neoformans is a fungal pathogen that targets immunocompromised patients such as those afflicted with HIV/AIDS, causing meningitis that is fatal if untreated. The C. neoformans ccr4Δ mutant lacks an mRNA deadenylase involved in regulation of mRNA stability, and exhibits cell wall defects and temperature sensitivity. Microarray analysis of the ccr4Δ mutant 10 minutes after a shift to 37°C shows up-regulation of transcript classes that are known to be induced by the unfolded protein response (UPR), leading us to hypothesize that the UPR is hyper-activated in the ccr4D mutant. The ccr4A mutant exhibits up-regulation of OST2, encoding a subunit of the ER oligosaccharyl transferase complex, even under non-stressed conditions, and was resistant to the ER stress-inducing drug tunicamycin. In addition, the ccr4D mutant exhibited increased DTT-extractable cell wall protein, increased secreted protein and increased activity of the secreted virulence factor phospholipase B (Plb1). OST2 expression was found to increase transiently in the wild type in response to host-temperature, returning to pre-shift levels by 2 hours. However, steady state levels of OST2 in the ccr4D mutant increased throughout the post-37°C shift time course. Taken together, these results suggest that the ccr4D mutant exhibits constitutive engagement of the UPR, and that transient engagement of the UPR accompanies host-temperature adaptation in C. neoformans.
and heart muscle through the GLUT 4 glucose transporter. Therefore, AMPK is one target of several anti-diabetic medications with the most prominent being metformin. AMPK has also emerged as a cardioprotective target against ischemic injury in the heart. The aim of this study is to determine whether anti-diabetes drugs have potential cardioprotective effects via activation of AMPK signalling pathway. We isolated cardiomyocytes and treated them with metformin and the recently discovered AMPK activator A-769662. The results demonstrated that cardiac AMPK is activated by these medications, suggesting that anti-diabetes drugs may also apply cardioprotection against ischemic injury.

Student
Mee Rim Choi

Major
Biomedical Sciences

Research Mentor
Dr. Piero Bianco

Title
Active, chimeric, fluorescent protein-tagged SSB proteins for in vivo and single molecule studies

Abstract
The Escherichia coli single-stranded DNA binding (SSB) protein is critical to all aspects of DNA metabolism where it stabilizes single-stranded DNA (ssDNA) intermediates generated during DNA processing. To facilitate real-time studies of SSB, we developed a novel, dual plasmid expression system to permit rapid purification of milligram quantities of active and stable, his6- and fluorescent protein-tagged SSB hetero-tetramers. The resulting SSB chimeras were purified using nickel column chromatography and shown to contain either 1 or 2 fluorescent proteins per tetramer. In vitro assays show that ssDNA binding and the physical and functional interaction with partner proteins are unaffected by the presence of the fluorescent proteins. In vivo studies show that the fluorescent proteins enable real time monitoring of the interaction of SSB with the repair DNA helicase RecG. Therefore, the chimeric, fluorescent SSB proteins are suitable for in vivo, in vitro and future single molecule studies.

Research Mentor
Dr. Karen Olson, Dr. Prasad Dhulipala

Title
Optimization of Sensor Regeneration and Plate Shaking speed for ForteBio Octet®

Abstract
The ForteBio Octet® is an instrument used for high-throughput protein quantitation and kinetic analysis. It is commonly used to measure various kinds of proteins such as IgG and erythropoietin (EPO). It uses biosensor tips coated with a biocompatible matrix that binds the specific protein. Regeneration of the biosensors provides a cost-effective method for quantification of proteins. In the case of IgG analysis, the cost for a 96 well plate assay will decrease from $248 to $21 with the use of regeneration. This project focused on optimizing the protocol for regeneration of IgG and EPO sensors. Additionally, since it has been observed that increasing the shaking speed increases sensitivity of the protein assays, this study tested two different shaking speeds and their effect on sensor regeneration.

Student
Hamzat A. Feshitan

Major
Pharmacology and Toxicology

Research Mentor
Margarita L. Dubocovich, Ph.D.

Title
Effects of Melatonin on Methamphetamine (MTA)-Induced Locomotor Sensitization

Abstract
Psychostimulant-induced behavioral sensitization in rodents provides a model of drug addiction. Therefore there is interest in attenuating this effect. The hormone melatonin may reduce MTA-induced locomotor sensitization. To test this hypothesis, we treated C3H-HeN mice for six days with MTA (1.2mg/kg, i.p.) or vehicle followed by 2h locomotor activity testing periods. After a four-day withdrawal period, mice were challenged with MTA and tested for sensitization. MTA pretreatments elicited robust sensitization in wild-type and MT1 and MT2 knockout (KO) mice, but this effect was blunted in MT1/MT2 KO mice. Melatonin administered in conjunction with the six MTA pretreatments dramatically increased the sensitization response. These results contradict our hypothesis and suggest that melatonin acts on the MT1 and MT2 receptors to potentiate, rather than diminish, the magnitude of MTA-induced sensitization. Funding R01DA021870 to MLD.

Research Mentor
Dr. David R. Pendergast

Title
Autonomic Dysregulation in Asthmatics: Effects on Cardio-Respiratory Function

Abstract
Asthma is widespread and debilitating. The mechanisms involved are unclear. Our hypothesis is that physiological responses contribute to asthmatic symptoms and exacerbations. Asthmatics (n = 4 of 80) were recruited and compared to controls (n=4 of 20). Testing included: ventilatory (VE), sensitivity to CO2, responses to tilt, and pulmonary function pre- and post-maximal exercise. Measures were VE,
cerebral blood flow (CBF), heart rate (HR), blood pressure (SBP, DBP) to test autonomic and autoregulatory control. ANOVA compared the two groups.

Asthmatics had lower CBF and HR in head down tilt (HDT) and higher DBP. During exercise, VE, PaCO2, and SBP increased more, and CBF less, indicating that sympathetic nerve activity was greater in asthmatics during exercise. Asthmatics also had depressed pulmonary function after.

These preliminary findings indicate dysregulation of autonomic and autoregulatory responses in asthmatics which may exacerbate symptoms.

Student  
Samantha Mattison, Mark Bryniarski, Dan Plumeri

Major  
Pharmacology & Toxicology

Research Mentor  
Dr. Ji Li

Title  
Vasodilator Effect of Lavandula in Isolated Rat Aortic Rings

Abstract  
Herba Lavandulae is a traditional Uygur herbal compound suggestive of providing protection to cardiovascular disease conditions such as myocardial infarction. This study aims to evaluate the mechanism of action of Lavandula decoction (LAE, active molecule) in the vascular wall. In the absence of vasoconstrictive agents, LAE failed to alter basal tensions of aortic rings. Phenylephrine (PE, 10 M) and KCl (80 mM) were individually administered to endothelium-intact aortic rings to cause contraction. LAE elicited relaxation of the rings treated with PE but not those treated with KCl. Endothelium removal abolished most vasodilator activity of LAE however the effect was recovered by increasing LAE concentration. It is well established that endothelial nitric oxide synthase (eNOS) vasodilates and therefore provides cardiac protection. The inhibitor of eNOS, NG-nitro-L-arginine methyl ester (0.1 mM), inhibited the vasodilator activity of LAE. In conclusion, LAE induced endothelium dependent relaxations through the nitric oxide (NO) signaling pathway.

Abstract  
Multiple Sclerosis is a neurodegenerative disease characterized by chronic inflammation of central nervous system tissue. Cigarette smokers have shown to possess a significantly increased risk for developing multiple sclerosis. Smoking has also been recently associated with accelerating the progression of relapsing-remitting MS to a secondary progressive form of the disease. Current smokers have experienced higher rates of disability, with periods of remission fewer in number and shorter in duration.

The mechanism by which cigarette smoke affects neuroinflammation is not yet fully understood, but a number of promising theories exist. It has been proposed that NNK, a known carcinogen in cigarette smoke, can directly damage neurons in the CNS. Elevated levels of cotinine, a metabolite of nicotine, has also been associated with a higher risk of developing MS, primarily in women. Overall, these findings should help encourage physicians to inform their patients of the specific risks of smoking with MS.

Student  
Jung Hyun Nam

Major  
Biomedical Sciences

Research Mentor  
Rosemary Dziak, Ph.D.

Title  
Effects of Cell Aging on Effects of Strontium

Abstract  
Strontium is a trace element that has been shown as strontium ranelate to have positive effects on bone metabolism. Our laboratory has been interested in the potential effects of a simpler form of this mineral, strontium citrate, on osteoblastic cells in order to evaluate it as a potential therapy for bone diseases. Using human osteoblastic cells obtained with informed consent of patients undergoing oral surgery, our lab has shown that strontium citrate can increase growth and differentiation. The purpose of this project was to further elucidate the effects of strontium citrate as a function of the culture conditions of the osteoblastic cells. Differentiation of the cells, measured by increases in alkaline phosphatase, was observed at various concentrations of strontium citrate with cells of relatively low passage number and inconsistent effects at higher passages. These studies suggest strontium citrate can be effective under appropriate growth conditions and has therapeutic promise.

Student  
Daniel Plumeri

Major  
Pharmacology & Toxicology

Research Mentor  
Ji Li, Ph.D

Title  
Natural Antioxidant Salidroside Inhibits Proliferation and Migration of Tumor Cells

Abstract  
Tumor cell formation and metastasis often occurs due to oxidative stress leading to the formation of intracellular reactive oxygen species (ROS). It has been established that higher levels of intracellular ROS manipulate tumor cell signaling to facilitate proliferative growth. Salidroside, a phenylpropanoid glycoside isolated from the Chinese herb, Rhodiola rosea, has previously been shown to have potent antioxidant properties. Thus, salidroside was tested
for its effects as an inhibitor of tumor cell proliferation due to its antioxidant nature. The results demonstrated that salidroside inhibited the intracellular ROS formation of human fibrosarcoma HT1080 and significantly reduced wound closure areas of HT1080 cells in a dose-dependent manner. Furthermore, salidroside significantly down-regulated the ERK signaling pathway which is also known to be important in tumor cell proliferation. These data suggest that salidroside could potentially combat tumor cell proliferation of HT1080 cells via reducing intracellular ROS levels and attenuating the ERK signaling pathways.

Student
Ravinder

Major
Biomedical Sciences and Medical Technology

Research Mentor
Peter Horvath

Title
Nutritional Status and Intake Post Nutritional Supplementation vs. Placebo in Prostate Cancer Patients Undergoing Radiotherapy

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), DRI plus Orthomolecular (OM), 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, (p <0.1). DRI and OM showed no change over time. There was significant disparity in carbohydrate use amid Placebo and DRI groups with trends in OM and Placebo. DRI and OM did not vary Carbohydrate intake, Placebo decreased carbohydrate intake. Sugar intake fell significantly for Placebo vs. OM (p<0.03), trended down vs RDA. Several micronutrients increased at T3 and T4 in OM and DRI, compared to Placebo (p<0.001). Micronutrients were significantly higher in OM vs. DRI at T3 and T4 (p<0.001). 95% of subjects given DRI or OM reached DRI except in Vitamin D and Vitamin A (50 and 75%, respectively) (p<0.05)

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.

Student
Martin Smallidge

Major
Biotechnology

Research Mentor
Hans Minderman, Ph.D.

Title
Optimizing Multiparameter Immunophenotyping with Quantitative Detection of Nuclear Translocation Events Using the ImageStream Platform.

Abstract
The ImageStream platform is a flow cytometry –based image analysis system that collects spectrally separated, spatially correlated images of cells. The platform is currently being utilized in the laboratory as a method to quantitatively detect intracellular localization of signaling intermediaries, such as the transcription factor NFkB. In this project, nuclear translocation data obtained with the ImageStream 100 is being compared with data obtained from the newer ImageStreamX , which is currently being beta tested. Having a method that can simultaneously detect intracellular translocation in several subpopulations of cells is highly desirable. Therefore, the feasibility of simultaneously detecting 7 fluorochromes using the ImageStreamX is being determined.

Student
Thomas P. Smith

Major
Medicinal Chemistry, Psychology

Research Mentor
Dr. Gabriela Popescu

Title
“Effects of NETO1 protein on NMDA receptor gating kinetics”

Abstract
The N-methyl-D-aspartate (NMDA) subtype of glutamate receptor is one of the major excitatory ligand-gated ion channels in the central nervous system. Recently it was discovered that
a novel protein, neuropilin tolloid-like 1 (NETO1), interacts with NMDA receptor subunits and this interaction may have important physiological roles. NETO1 is a transmembrane protein highly expressed throughout the mammalian brain that contains; structural features similar to those in SOL-1 auxiliary proteins, which have been shown to affect AMPA receptor gating; and intracellular PSD scaffolding domains similar to TARP proteins, which are involved in the trafficking of AMPA receptors. To determine whether NETO1 affects the gating of NMDA receptors, both microscopic and macroscopic electrophysiology techniques were used to examine the kinetic properties of NMDA receptors in the presence of NETO1. Our results suggest that NETO1 does not have direct effects on the gating kinetics of NMDA receptors.

**Student**
Russell James Van Coevering III

**Major**
Biochemistry

**Research Mentor**
Michael Buck

**Title**
Components of Histone modifiers in the control of Gene Expression.

**Abstract**
Chromatin modifications are a key regulatory element in gene expression. Certain patterns of occupancy status, and modifications to the histone polypeptides themselves, have been shown to correlate with active or repressed states. The Tup1-Ssn6 complex represses gene transcription; Tup1 itself interacts with chromatin modifiers, HDA1 and Set2. HDA1 is a histone deacetylase, and Set2 is a histone methyltransferase. The Functions of these proteins in gene expression can be assessed with quantitative PCR. Deletion strains of yeast with these knockouts are lysed, and their RNA is purified, converted into DNA and then amplified with special regents that fluoresce. This fluorescence is detected, and the time at which a certain threshold is reached gives a quantitative analysis of RNA levels. Primers, for the promoters of genes that are controlled by the histone modifying proteins, where used to see how deletions of these genes affect gene transcription.

**Student**
Shah Karan Vipul

**Major**
Biotechnology

**Research Mentor**
Kate Rittenhouse-Olson, Ph.D. S.I. (ASCP)

**Title**
Improvement of the quality and the reproducibility of E. coli NATtroTM

**Abstract**
Bacterial NATtro™ products are non-infectious, quantitative, qualitative and refrigeration stable products that are used as standards for Nucleic Acid Testing. The bacterial cells are treated chemically to alter their surface proteins while leaving their nucleic acids intact. The purpose of this study was to standardize the bacterial NATtro™ process by defining the biomass of the material that should be used, by limiting the reaction volumes to reduce the lot-to-lot variability, and to improve the quality and reproducibility of the bacterial NATtro™ products. VoluPAC tubes were used to define the biomass of the E. coli. Resuspension of E. coli in PBS instead of the Nutrient broth dramatically increased the consistency, while doubling the concentration of the proprietary inactivating material decreased the reaction volumes by ten folds.

**Student**
Jenna Goehle

**Major**
Nursing

**Research Mentor**
Yu-Ping Chang, PhD., RN.

**Title**
Prescription Opioids Use Among Older Adults with Chronic Pain
Abstract

Purpose: To describe the use of prescription opioid medication among older adults with chronic pain and the amount of pain relief experienced. Methods: Participants were recruited from the outpatient clinics at the Veteran Affairs Medical Center at Buffalo, senior apartments, and a senior center. Instruments included Medication Adherence Scale (MAS) and the Pain Inventory Short Form (BPI-SF). Descriptive statistics were utilized for analysis. Results: Twenty-one older adults were recruited. Two older adults (9%) reported taking their prescription opioid medications more than prescribed whereas almost half of the older adults reported that they took less opioid medications than recommended. Six older adults self-medicated their pain using over-the-counter pain medications. On average, participants reported a moderate level of pain (mean=4.33). Their pain moderately interfered with their walking ability (mean=4.9) and normal work (mean=3.86). Conclusion: Findings provide insight regarding the use of prescription opioids among older adult experiencing noncancer chronic pain and insight as to how older adults adhere to their prescribed opioid medication regimens.

Student
Heather N. Martin

Major
Nursing

Research Mentor
Dr. Mary G. Carey

Title
Prevalence of Metabolic Syndrome among Professional Firefighters

Abstract

Background: The risk for cardiovascular events is higher for those with metabolic syndrome (MetS); and it is known that firefighters have a fourfold risk for cardiovascular events. Therefore, the purpose of this study was to quantify MetS among professional firefighters.

Methods: Firefighters were recruited and fasted for at least 8 hours; five anthropometric and physiologic measurements were obtained. Firefighters were considered to have MetS with >2 of the 5 criteria for MetS.

Results: 75 firefighters (age 42±7.5 years, mostly Caucasian white men) were recruited from six different fire houses. On average, each firefighter had 2.3±1.4 risk factors, with a total MetS prevalence of 45%. Men had significantly (p<0.05) higher systolic (113 vs 133 mmHg) and diastolic blood pressure (BP) (74 vs. 86 mmHg) than women, respectively.

Conclusion: The prevalence of MetS among Buffalo firefighters is higher than the general population (34%) and males have a higher BP than female firefighters.

SCHOOL OF PHARMACY & PHARMACEUTICAL SCIENCES

Abstract

Purpose. Flavonoids quercetin and kaempferol are major constituents of Ginkgo biloba extract. The ABC efflux transporter, Breast Cancer Resistance Protein (BCRP, ABCG2), is involved in the transport of quercetin and represents a possible mechanism for the low bioavailability of quercetin. Our objective was to investigate whether kaempferol inhibits BCRP-mediated quercetin efflux through competitive inhibition.

Methods. The intracellular uptake of kaempferol or quercetin, with and without specific inhibitors, was determined in BCRP-expressing MCF-7 cells. Samples were analyzed using LC/MS/MS.

Results. The accumulation of quercetin increase with time post-IR. The accumulation of quercetin increase with time post-IR. Uptake of both glutamine and glutamate were shown to measured by scintillation counting at 0, 1, 4, 24, and 48 hr post-IR. Uptake of both glutamine and glutamate were shown to increase with time post-IR.

Conclusion. Kaempferol may inhibit BCRP-mediated quercetin efflux through competitive inhibition. The use of flavonoids in combination may increase their bioavailability through transport interactions.

Student
Jorge Gallegos

Major
Pharmaceutical Sciences

Research Mentor
Marilyn E. Morris, Ph.D.

Title
The Bioflavonoid Kaempferol Inhibits ABCG2-mediated Quercetin Efflux through Competitive Inhibition

Abstract

Purpose. Flavonoids quercetin and kaempferol are major constituents of Ginkgo biloba extract. The ABC efflux transporter, Breast Cancer Resistance Protein (BCRP, ABCG2), is involved in the transport of quercetin and represents a possible mechanism for the low bioavailability of quercetin. Our objective was to investigate whether kaempferol inhibits BCRP-mediated quercetin efflux through competitive inhibition.

Methods. The intracellular uptake of kaempferol or quercetin, with and without specific inhibitors, was determined in BCRP-expressing MCF-7 cells. Samples were analyzed using LC/MS/MS.

Results. The accumulation of quercetin increase with time post-IR. The accumulation of quercetin increase with time post-IR. Uptake of both glutamine and glutamate were shown to measured by scintillation counting at 0, 1, 4, 24, and 48 hr post-IR. Uptake of both glutamine and glutamate were shown to increase with time post-IR.

Conclusion. Kaempferol may inhibit BCRP-mediated quercetin efflux through competitive inhibition. The use of flavonoids in combination may increase their bioavailability through transport interactions.
**Student**
Sean G. Lee  
**Major**
Pharmaceutical Sciences  
**Research Mentor**
Ho-Leung Fung, Ph.D.

**Title**
Metabolism and Inactivation of Organic Nitrates by Aldehyde Dehydrogenases

**Abstract**
The bioactivation of several organic nitrates (ORNs) by aldehyde dehydrogenases (ALDH) and the subsequent enzyme inactivation was investigated. Nitric oxide (NO) generation from ORNs by purified ALDH1 and ALDH2 was monitored with an NO electrode. ALDH2 liberated NO from 1mM nitroglycerin, 1mM isosorbide dinitrate and 1mM nicorandil, but failed to metabolize either 1mM isosorbide-2-monoisocitrate or isosorbide-5-mononitrate. ALDH1 produced NO from all ORNs investigated. The inactivation of the ALDH isozymes was examined using rat hepatic homogenate. Following 1mM ORN incubation for 30 minutes, ALDH1 activity was reduced by nitroglycerin (to 9.3±2.3% of control), isosorbide dinitrate (87.2±5.4 % of control), isosorbide-2-monoisocitrate (63.4±8.9% of control) and isosorbide-5-mononitrate (84.1±12.4% of control). Only nitroglycerin inhibited ALDH2 (to 1.6±1.9% of control). These data suggest that the bioactivation of ORNs by ALDH and the subsequent enzyme inactivation were selective, and this selectivity may play a role in determining the safety and efficacy among these drugs.

**Student**
Carrie Sanborn  
**Major**
Pharmaceutical Sciences  
**Research Mentor**
Javier G. Blanco, Ph.D.

**Title**
Increased Carbonyl Reductase 1 (CBR1) Expression in Hearts from Donors with Down Syndrome

**Abstract**
**Purpose:** Carbonyl reductase 1 (CBR1) reduces the anticancer daunorubicin into cardiotoxic daunorubicinol. Leukemia patients with Down syndrome (DS) are at high risk of anthracycline-related cardiotoxicity. CBR1 is located in the DS region (21q22.13). Here, cardiac CBR1 expression in DS is documented.

**Methods:** Four DS and 15 non-DS hearts were analyzed. Trisomy 21 was examined by comparative genomic hybridization (CGH). CBR1 mRNA was analyzed by real time RT-PCR. CBR activity was measured with menadione hybridization (CGH). CBR1 mRNA was examined by real time RT-PCR. CBR1 expression in DS was higher in DS hearts than in non-DS hearts (DS: 6.0- relative fold vs. non-DS: 1.2- relative fold, p<0.05). CBR activity for daunorubicin was higher in DS hearts than in non-DS hearts (DS: 3.8±0.1 mmol/min•mg, non-DS: 2.3±0.2 mmol/min•mg, p<0.05). Cardiac CBR1 expression is increased in DS due to the gene-dosage effect.

**Supported by** ARRA supplement to NIH GM073646
Significantly lower EFV concentrations were noted in tobacco and alcohol users in the extensive metabolizer group with lower CD4 counts and higher viral loads (p< 0.05).

**Conclusions:** In addition to an association between CYP2B6 516G>T and EFV pharmacokinetics, tobacco and alcohol use was associated with significantly lower EFV trough concentrations among patients with functional alleles. The mechanisms that underlie these observations may include combined pharmacogenomic and behavioral components.

**Student**  
Amy Zhou  
**Major**  
Pharmacy and Pharmaceutical Sciences  
**Research Mentor**  
Aiming Yu, Ph.D.

**Title**  
MicroRNA-1291 regulates multidrug resistance-associated protein 1 (MRP1/ABCC1) in pancreatic cancer cells

**Abstract**  
Objectives: Multidrug resistance-associated protein 1 (MRP1/ABCC1) is a transporter that functions to efflux xenobiotics, including chemotherapeutic drugs, across cellular membranes. Overexpression of MRP1 in tumor cells may confer multidrug resistance in cancer therapy. In this study, we aimed to determine if miR-1291 regulates MRP1 protein expression.

Methods: Pancreatic cancer PANC-1 cells were transfected with miR-1291-expressing plasmid, miR-1291 antagomir, or corresponding control plasmid/oligo. Western blotting was used to assess MRP1 protein expression, and flow cytometry was employed to evaluate MRP1-mediated drug transport.

Results: Immunoblot analysis revealed a decrease in MRP1 expression in PANC1 cells after transfection with miR-1291-expressing plasmid.

Conclusions: miR-1291 regulates MRP1 expression in PANC1 cells. These findings suggest multidrug resistance may be overcome through intervention of microRNA pathways.

**Student**  
Jian Li Zhu  
**Major**  
Pharmaceutical Sciences  
**Research Mentor**  
Aiming Yu, Ph.D.

**Title**  
Comparison of Harmine Metabolism Between Wild-Type and CYP2D6-Transgenic Mice.

**Abstract**  
Purpose: Harmine is a psychotropic compound and mainly metabolized by CYP2D6 in human. The work aimed to investigate the effect of CYP2D6 polymorphism in harmine metabolism.

Method: Harmine metabolism was conducted using mouse liver microsomes prepared from wild-type and CYP2D6-transgenic mice. Harmine clearance in mice was predicted according to metabolic stability data.

Result: Both WT and Tg-CYP2D6 MLM can metabolize harmine and produce harmol. The T1/2, CL’int values of harmine were $21.5\pm 0.1$ min and $1272\pm 4$ ml/min/kg in Tg-CYP2D6 MLM, and $28.4\pm 0.7$ min and $962\pm 22$ ml/min/kg in WT MLM. The predicted in vivo clearance of harmine was $84.05\pm 0.02$ and $82.30\pm 0.17$ ml/min/kg in Tg-CYP2D6 and WT mice.

Conclusion: Harmine metabolism was similar between WT and Tg-CYP2D6 mice, indicating other enzymes besides CYP2D6 might be involved. The metabolism and elimination of harmine in vivo might not be influenced by CYP2D6 polymorphism.

**Student**  
Amber M. Dewey  
**Research Mentor**  
Jennifer L. Temple

**Title**  
GAIT MECHANICS: TRANSITIONING FROM LEVEL WALKING TO STAIR AMBULATION

**Abstract**  
OBJECTIVES: The aim of this study is to record the gait mechanics of young healthy active persons with normal bodyweight as they transition from level walking to negotiating a set of stairs. A normative kinematic, kinetic neuromuscular activity profile will be developed from which persons with orthopedic or vestibular dysfunction will ultimately be compared.

METHODS: Movement patterns will be recorded using a conventional motion capture system integrated with force platforms embedded in a walkway and stairs. Reflective markers taped over bony landmarks of the lower limb and feet, trunk, arms, and head define 13 segments that represent the whole body. Simultaneous neuromuscular activity of the superficial leg muscles will be recorded as subjects walk at self-selected pace and contact opposing force platforms with each foot.

CONCLUSION: This knowledge may have important implications for the treatment and development of rehabilitation programs to address impairment that may result from these pathologies.
Title
SEX DIFFERENCES IN THE
PHYSIOLOGICAL EFFECTS OF
ACUTE CAFFEINE
ADMINISTRATION IN
ADOLESCENTS

Abstract
Caffeine is the most widely used psychoactive substance in the world, but its effects in children and adolescents remain understudied and poorly understood. The purpose of our study was to assess the extent to which adolescents develop tolerance to the effects of caffeine and to examine the effects of acute and chronic caffeine use on snack food intake. We found that caffeine use had significant effects on blood pressure and on snack food intake. In addition, our data suggest that males may be more susceptible to the effects of caffeine than females. This study provides empirical evidence that caffeine consumption in children should be limited. Given that the majority of caffeine consumed in children comes from soda, these data also provide empirical support for efforts from the New York State legislature to implement a tax on sugar sweetened beverages.

Students
Allie Matarasso, Dhwani Patel, Aris Otminski, Jessica Tobin

Research Mentor
Peter Horvath Ph.D., Harold Burton Ph.D., Brian Williams M.S., Manpreet Chadha MBBS, James Mohlern M.D., Donald Trump M.D. FACP

Title
Effect of Vitamin D on the Progression of Prostate Cancer and Functional Fitness.

Abstract
Prostate cancer progression may be related to lower functional capacity/muscle strength. Substantial data exists suggesting a positive relationship between vitamin D and physical function. This study, a placebo controlled randomized crossover design, will examine the correlation between vitamin D replacement and blood levels with the progression of prostate cancer, as measured by changes in PSA levels. The 140 subjects (70 per group) were recently diagnosed and have not received any treatment. The study will look at changes in physical function and psychological health over 9 months in two groups (placebo and vitamin D) by using physical function tests (YMCA 3 minute step test, etc.), questionnaires (Yale physical activity survey, Schwartz cancer fatigue scale), and diet by food frequency survey. We hypothesize that the Vitamin D supplementation will cause increased physical function which will therefore decrease PSA level. We also expect a decrease in physical function for the placebo group.

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 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.

Students
Katie Lockhart, Benjamin Grunin, Elizabeth Collins, Kristie Mack

Research Mentor
Dr. Claude Welch, Ph.D., Nikole Seitz, and Julie Ficarra

Title
The Access to Water Resources: The Case of Kerala, India

Abstract
This poster explores the dynamics of access to water resources, focusing on the complex relationship between the Coca-Cola plant, the government of India, and local farmers in Kerala, India.

Students
Kevin Pearson, Robert Townsley, Rose Piacente, Shelby Griswold

Research Mentor
Dr. Claude Welch, Ph.D., Nikole Seitz, and Julie Ficarra

Title
Perceptions of Veiling

Abstract
The perceptions of veiling vary throughout the world. This poster strives to present the history and traditions of veiling in the Muslim world. From the hijab to the burka, head coverings are based more on country traditions than religious mandates. While the roots of this tradition are founded in the Quran, its modern day practice varies between Muslim countries. Through this research we hope to enlighten non-Muslims about the practice of veiling and help to dissolve western ignorance of the topic.
**Research Exploration Academy**

The Research Exploration Academy is an inclusive and diverse community of student and faculty scholars that fosters creativity, collaboration, and the development of research skills. Under the direction of Academic Director, Dr. James N. Jensen, Professor, Department of Civil, Structural and Environmental Engineering, students applied research skills to the development of new knowledge in the student-selected field of pharmaceuticals in the environment.

**Students**

Chelsea Abrams, Erin M. Baumeister, Emily Fiore, Dena Hayes

**Title**

Environmental and Human Health Impacts from the Metabolites and the Production of Cocaine and Methamphetamine

**Students**

Nana Akuoko, Ryan M. Arigo, Meghann Nielsen, Mansu Shim, Andrew Varalli

**Title**

How Increased Levels of Amoxicillin, Azithromycin, and Cephalexin in the Water System Impact Antibiotic Resistance and Human Health

**Students**

Ankita M. Kale, Jun Soo Kim, Jessica Meyers, Muhamad Asnawi, & Mohd Ariff

**Title**

Potential Effects on Human Health Due to Acetaminophen in Drinking Water

**Students**

Intan Syafinaz, Abdul Halim, Alisa N. Li, Cassandra Rivais, Andrew Cameron Gibson

**Title**

Impact of Secreted Pharmaceutical Estrogens on Selected Aquatic Organisms

**Student**

Bernadette Clabeaux

**Major**

Biological Sciences

**Title**

Potential use of the macroalga Chara for the phytoremediation of cadmium contaminated soils

**Student**

Dongliang Wang

**Major**

Biostatistics

**Title**

Direct density estimation of L estimates via characteristic functions with applications

**Student**

Jordan Troisi

**Major**

Psychology

**Title**

Priming Attractiveness Interferes with Competence for Women who Prefer Dating Smarter Partners

**Student**

Donghui Jing

**Major**

Chemical and Biological Engineering

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Directed Differentiation of Human Embryonic Stem Cells to Cardiomyocytes for Heart Failure

**Student**

Colleens Erraihani
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Urban and Regional Planning
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Bostons Back Bay: An Urban Stage
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Hui You
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Pharmacology and Toxicology
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Atrial Natriuretic Peptide Activates Pancreatic Islet PI3K/Akt/Foxo1a/Cyclin D2 Signaling
Student
Ariana Young
Major
Psychology
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Thinking About Your Favorite Celebrity: The Influence of Parasocial Relationships on Body Image
Student
Jennyfer Ruiz
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Urban and Regional Planning
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From Quakers to China. The evolution from suburban to urban infrastructure
Student
Salah Alzaiti
Major
Nursing
Title
Is the QRST Angle a More Sensitive Marker of Ischemia than ST Segment Deviation
Student
Limei Liao
Major
Nursing
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Metabolic Syndrome: Quantified and Reduced in Firefighters
Student
Murfat Ibrahim
Major
Biological Sciences
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Investigating the Role of Huntingtin in the Transport of Rab 5 and Rab 11 Vesicles
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Melissa Zelanzy
Major
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Identify Lineaments in NYS using Remote Sensing Techniques for Geological Carbon Sequestration
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Amrita Herkal
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Identification and Characterization of Cell Fusion genes in Neurospora crassa
Student
Abhiram Maddi
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Oral Biology
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Mannosylation of cell wall proteins is required for covalent incorporation into the cell wall of the filamentous fungus Neurospora crassa.
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Rachel Bartalone
Major
Exercise and Nutrition Sciences
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Nutritional, Food, Antioxidant, and Plasma Levels in Prostate Cancer Patients Enduring Radiotherapy
Student
Rachael Butler
Major
Nursing
Title
Sleep Quality and Sleep Patterns of On Duty Professional Firefighters
Student
Anushree Sharma
Major
Social and Preventative Medicine
Title
Internet Based Investigation of E Cigarette Abuse Potential
Student
Kunsang Dolma
Major
Biological Sciences
Title
Role of GSK and PS in amyloid precursor protein vesicle transport
Student
Emily DiBlasi
Major
Biological Sciences
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Phylogenetic relationships of ectoparasitic mites (Acari: Erythraeoidea) on Argentine walking sticks
Student
Cheryl Crotser
Major
Nursing
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Receiving News of a Family BRCA1/2 Mutation: Messages of Fear and Empowerment
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Anna Bianchi
Major
Cellular-Molecular Biology-RP
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Role of beta5 integrin in TGFbeta induced EMT and tumorigenic potential
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Luisa Whittaker
Major Chemistry

Title Synthesis, Electronic Structure, and Depressed Phase Transition of Vanadium(IV) Oxide Nanostructures

Student Sean Depner

Major Chemistry

Title Synthesis, Characterization, and Electronic Structure of Early Transition Metal Oxide Nanocrystals

Student Mary Clausen

Major Physiology and Biophysics

Title Regulation of cerebral blood flow during exercise in men and women

Student Laura Hornung

Major Molecular Pharmacol and Cancer Therapeutics

Title Investigating NCOR1 and NCOR2/SMRT Deregulation in Prostate Cancer

Student Jinge Hu

Major Civil, Structural and Environmental Engineering

Title Commercial Vehicle Travel Patterns in Urban Areas

Student William White

Major Molecular & Cellular Biophysics and Biochemistry-RP

Title Extension of Suzuki Miyaura reaction for the synthesis of highly efficient multifunctional agents

Student Anurag Joshi

Major Industrial and Systems Engineering

Title Comparison of Heuristics for Inexact Graph Matching with applications to information fusion.

Student Anthony Smith

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Title Photochemically Triggered Assembly of Composite Nanomaterials through the Photodimerization of Adsor

Student Srinivas Rao, Myneni Venkatasatya

Major Oral Biology

Title Functional Epitopes of Tannerella forsythia BspA Protein in TLR2 Activation.

Student AKM Khoda

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Title Modeling of Variational Porous Tissue Scaffolds under Load Condition.

Student Michelle Lum

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Title Bryostatin Induced Protein Kinase C Alpha Downregulation Involves a Lysosomal Pathway

Student Lye Theng Lock

Major Chemical and Biological Engineering

Title Generation of pancreatic islet precursor cells from human embryonic stem cells in a bioreactor

Student Eddie Yeung

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Title Natural Antioxidant Isoliquiritigenin Selectively Inhibits Proliferation of Prostate Cancer Cells

Student Todd Penman

Major Biomaterials

Title Evaluating Coefficient of Friction Changes to Dental Restorative Materials from Tooth Whitening

Student Chao Tong

Major Pharmacology and Toxicology

Title Macrophage Migration Inhibitory Factor Deficiency Augments Cardiac Dysfunction in Type 1 Diabetic Heart

Student Jinying Wang

Major Pharmacology and Toxicology

Title The Cardioprotection of Activated Protein C Against Myocardial Ischemic Injury

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Ying-Yu Chao  

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Ibrahim Ozbolat  

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Hua Yang  

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Neeraja Subrahmaniyan  

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Magdalene Tukov  

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Heather Held  

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Ashirwad Chowriappa  

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Wa Zheng  

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Chen Yang  

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Jeremy Waight  

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Jungkwun Kim  

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Marta Migocka Patrzalek  

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Sheela Rani Karunanithi  

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Fanya Tan  

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Avinash Dharndhikari  

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Student  
Seungyun Baik  

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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.