Celebration of
Academic Excellence

University at Buffalo
Thursday, April 20, 2006

Center for the Arts
School of Architecture & Planning

Student
James Taras Brucz, Architecture
Advisor/Mentor
Omar Khan

Title
Composite Elastomeric Structures

Abstract
I am interested in presenting a body of work that links research and practice in architecture. Generative-Architecture will present not only research in the structure and behavior of materials, but also my academic work in the design studio. In-studio, I have created architecture that is responsible to program, context, and function; In research, I have explored complex, sophisticated, and responsive material details. The aim, by bringing these two works under an umbrella, is to present architectural design as a complex mode of inquiry that includes traditional research as well as un-precedented design exploration.

Student
Rafal T. Godlewski, Architecture
Advisor/Mentor
Laura Garofalo

Title
Surface, enclosure and structure as active systems

Abstract
The skin of a building acts as a mediator between the outside and the inside environment. It is as an active, permeable membrane that deals with visual, spacial, environmental, and structural issues. The focus of the presentation is to outline the elements involved in the skin of buildings and to re-conceive them as coherent systems that render performative, sustainable and structural enclosures.

Student
Yee Man Wong, Architecture
Advisor/Mentor
Kenneth Mackay

Title
Pattern and System: The Generation of Architectural Systems through the Abstraction of Patterns

Abstract
“Pattern” is a broad term that describes anything that exhibits repetitive and sequential logics. It could be found anywhere from the cells of a leaf to the stitching of a sweater to the planetary movements in the universe. Whether it is a natural phenomenon or artificial design, a pattern is the result of conscious arrangement for a particular purpose.

I selected an image of migrating geese, recognizing various patterns based on the visual alignment of the image and the behavior of the content. Through studies in three-dimensional projection, sunlight, perspective and water, a series of analytical relationships emerged between time, location, and movement. These relationships become the basis for the development of architectural systems such as skin, structure, lighting, programming, and viewing in the interactive designs for a wall replacement on Diefendorf Hall, a water tower on South Campus, as well as the final proposal for an aquatic center on Main Street.

Students
Vera Venkova and Kari Terwilliger, Department of Urban and Regional Planning

Advisors/Mentors
Professors Danise Levine and Jordana Maisel

Title
Accessibility and Zoning

Abstract
The project was an in-depth research of codes and regulations applicable to building codes and land uses in Ontario, Canada. In addition, ADA and Universal Design were researched and findings were compared to the existing Canadian codes. The goal of the project was to provide a recommendation and analysis for the site to make it fully accessible to everyone. The poster contains a land-use map for the specified site, as well as examples of how codes and regulations will affect the site. The poster was designed to provide people with small or no knowledge of planning with the way it affects sites that they may visit every day.

Student
Steven S. Nagowski, Department of Urban and Regional Planning
Advisor/Mentor
Professor Alex Bitterman

Title
The Larkin Industrial Complex

Abstract
This project was a study of the history of the former Larkin Soap Manufacturing Company’s former industrial site that still remains in Buffalo, NY today. The project entailed many first person visits, historical research, current assessment of the area and future plans, if any. This poster was used in conjunction with a presentation along with a printed booklet as our final project for our studio. Although Buffalo’s days of being an industrial center are coming to a close, I gained a greater appreciation for our industrial past and the structures we build to support them. The can and should be reused towards creating a better city.

Student
Aaron Knoll, Department of Urban and Regional Planning

Title
Generating Eco-Tourism: LeClair-Kindel Wildlife Sanctuary

Abstract
LeClair-Kindel Wildlife Sanctuary is located in Amherst, New York on an easement from the power company. A sign at its entrance boldly proclaims that its purpose is to be for the “public enjoyment.” Although passive maintenance has allowed native plant and animal species to live beneath the power lines overhead, the sanctuary in its current condition fails to act as an
than in an ion trap MS.

humic acids was lower in single ionization, the extent of ionization found that under positive electrospray temperature for extraction. Lastly, it was indicated that 60° C is optimum efficiency was also examined, and in addition to a systematic investigation is considered in such a way that the naturally landscaped environment is not disturbed, but at the same time allows LeClair Kindel wildlife sanctuary to function as a true attraction and sanctuary within a growing suburban community.

**COLLEGE OF ARTS & SCIENCES**

**Student**

Jonas Locke, Chemistry

**Advisor/Mentor**

Dr. Diana Aga

**Title**

Optimizing extraction and analysis of tetracyclines from different soil types using accelerated solvent extraction and liquid chromatography/mass spectrometry

**Abstract**

Tetracyclines are difficult to extract from soil, and quantification is often not reproducible between various soil types. Results of a systematic investigation to determine the influence of temperature and extraction solvent on the efficiency of accelerated solvent extraction for tetracycline in various soil types will be presented. Analysis of tetracyclines by liquid chromatography with electrospray ionization mass spectrometry is susceptible to matrix interferences. Therefore, selection of solid-phase extraction sorbents is key to effective clean-up. It was found that the use of a strong anion exchange cartridge in tandem with a reversed phase cartridge results in approximately 65% reduction in co-extracted humic acids. The effect of temperature on the extraction efficiency was also examined, and indicated that 60° C is optimum temperature for extraction. Lastly, it was found that under positive electrospray ionization, the extent of ionization suppression caused by co-extracted humic acids was lower in single quadrupole mass spectrometer (MS) than in an ion trap MS.

**Student**

Christopher A. Bailey, Psychology

**Advisor/Mentor**

Jamie M. Ostrov, Ph.D.

**Title**

Subtypes of Aggression and Media Exposure Correlates in Late Adolescents

**Abstract**

Prior studies have indicated positive correlation between violent media exposure and physical aggression. The current study (N=200) examines specific functions (e.g. proactive and reactive) and forms (e.g. physical and relational) of aggression associated with violent media exposure in emerging adulthood (i.e. college students). Participants completed self-report measures of media exposure (i.e. TV, movies, videogames, computer, and music) and aggression (i.e. proactive and reactive physical and relational aggression). Results indicate significant unique associations between reactive physical aggression and violent media exposure.

**Student**

Brenton Stone, Mathematics

**Advisor/Mentor**

Gino Biondini

**Title**

Polarization-induced outage probabilities in optical fiber transmission systems

**Abstract**

Optical fiber communication systems are designed to operate with extremely low error rates. This requirement, combined with the many physical effects that affect the system behavior, makes it especially difficult to accurately estimate their performance. In particular, because the desired error probabilities are so small, conventional methods of numerical simulation are drastically inadequate to estimate these systems' outage probabilities.

Recently, it was shown that the technique of importance sampling (IS) can obviate this problem and allow researchers to efficiently quantify outage probabilities. Here we apply IS to study transmission impairments caused by polarization-mode dispersion, which is one of the main factors affecting system performance. We compare our results with existing results based on simplified models, and we show that those models may significantly underestimate a system's outage probability.
Spanish, using spectrographic analysis to see if there is any acoustic reality to this breakdown of the phonemes into these open, close and relaxed allophones.

**Student**
Rebecca Trager, Rebecca Haderer, Christa Bishop, Psychology Department

**Advisor/Mentor**
Dr. Gretchen Sechrist

**Title**
Importance of Attractiveness, Personality, and Gender Differences Among College Dating

**Abstract**
This study investigated gender differences, the importance of physical characteristics, and personal attributes to individuals when choosing a mate. College students (N=96) rated a picture paired with a description of the opposite sex. We found main effects for physical attractiveness and personality. Compared to previous studies, the present study suggests the gender gap is decreasing in mate selection. Results provide evidence that men are placing less emphasis on attractiveness versus women.

**Student**
Stefan Vujcic, Chemistry

**Advisor/Mentor**
Dr. Frank V. Bright

**Title**
Micropatterned Nanoscopically Tailored Sensors for Ischemia Monitoring

**Abstract**
In collaboration with colleagues at Los Alamos National Laboratory and the UB Center for Cardiovascular Medicine, we are developing photonically-based sensors to monitor pathophysiological end-points associated with the progression of heart disease. Our research efforts are focusing on developing tiny micropatterned nanoengineered solid-state sensors to continuously and quantitatively simultaneous detection of O2 tension, pH, and pCO2.

We envision these implantable sensors being used: (1) to identify alterations in the course of disease at a preclinical stage and prior to decomposition or an untoward cardiac event and (2) in peri-operative and intensive care settings.

This Poster summarizes the analytical figures of merit and performance factors for a series of novel chemical sensor platforms based on hexagonal surfactant/silicate mesostructured thin films doped with an O2 responsive luminophore, tris (4,7-diphenyl-1,10-phenanthroline) ruthenium(II) ([Ru(dppe)3]+). In addition, the poster summarizes the optimal conditions for the development of a miniaturized multi-parameter sensor array.

**Student**
Kristen Paris, Geological Sciences

**Advisor/Mentor**
Tracy Gregg

**Title**
Ice-rich terrain in Gusev Crater, Mars

**Abstract**
Gusev crater is the current location of the Mars Exploration Rover, Spirit, which is looking for signs that water once occupied this crater. So far, the only evidence of water is the presence of cross-bedding, which can result from several processes. Water still may have been present, but not in liquid form. Evidence suggests that the subsurface of Gusev may have been ice-rich and was excavated by the Thira impact. This “dirty ice” once occupied the southeastern quadrant of Gusev and several small areas in the center. These areas were embayed by the lava flows, and over time the ice sublimed. The resulting terrain resembles hummocky deflation terrain seen on earth where glaciers have retreated.

**Student**
Justin Martin, History, Minor: Political Science

**Advisor/Mentor**
Dr. Richard Filipink, Dr. Albert L. Michaels
Title

Abstract
My project, titled Another Way to Peace: Ronald Reagan and Grand Strategy, 1981 to 1984, is a brief examination of foreign policy-making in the Reagan era. This project will seek to address the nature of Reagan's anti-Soviet policy in the years of “building strength” and how it manifested itself in American Foreign Policy.

The thesis I seek to advance relates to the oft-used term of “Peace through strength” by Reagan and his associates. “Peace Through Strength” was a viable foreign policy doctrine and a central element to a successful grand strategy. I will seek to advance the thesis that Reagan's strategy and its success is extraordinarily important if we as historians seek to understand the end of the Cold War. In all, Reagan's strategy was a highly successful one, which hastened the collapse of the Soviet Union and made him, perhaps, the Cold War's most successful President.

Student
Theresa Gugger, Speech and Hearing Sciences

Advisors/Mentors
Geralyn R. Timler, PhD and Jan Charles-Luce, PhD

Title
Utterance Formulation Errors in Children with Language Impairment and/or ADHD

Abstract
Differentiating attention and language problems in children with attention deficit/hyperactivity disorder (ADHD) is challenging. Recent research suggests that utterance formulation measures may be a viable clinical tool to distinguish language profiles in children with ADHD and children with language impairment (LI). This project extends existing evidence by examining formulation errors in four groups of age matched school-age children: six children with ADHD only, six children with ADHD and LI, four children with LI only, and ten typically developing children. Three narratives were elicited from each participant. The narratives were transcribed and entered into a software program to summarize formulation errors. Dependent measures included the number, location, and type of error (i.e., revisions, word and phrase repetitions, filled pauses, and silent pauses). The results will focus on the potential of these measures to differentiate language impairment in children with diverse clinical profiles.

This project was supported by a Students Preparing for Academic & Research Career (SPARC) award from the American Speech-Language-Hearing Association.

Student
Katherine Garriga, English

Title
Critical Age Hypothesis and the Brain!

Abstract
The critical age hypothesis posits that after a specific time, the brain is unable to fluently learn a first language. This paper addresses the issue of the critical age for first language learning by looking at research in neural structure in both humans and animals, the deaf population, brain damage occurring in childhood, children isolated from linguistic input past early childhood, and second language learning. While there is no direct evidence, such as a child who has been deprived of linguistic input but has an otherwise normal life attaining language after early childhood, other areas of neurology and cognitive science are able to provide evidence for the critical age. The paper theorizes what the predominant linguistic areas of the brain do when no linguistic input is received in the sensitive period, and why the structure of the brain and neurons might be cause for the critical age.

Student
Ethan Gable, Psychology

Advisor/Mentor
Dr. Scott Wersinger

Title
Turning the other cheek

Abstract
The neuropeptide vasopressin has been implicated in the control of social behaviors including aggression through two brain receptors, vasopressin 1a and vasopressin 1b (Avpr1b). Specifically, aggression decreases with a decrease in vasopressin activity. Aggression can take on different forms based on the situation and assumed motivation of the animal. Offensive aggression is an unsolicited attack from one animal to another. Defensive aggression, on the other hand, is an attack from one animal to another in response to an initial attack. In Avpr1b receptor knockout mice, offensive aggression has been shown to decrease. In this experiment, the defensive aggression of male Avpr1b knockout mice was shown to decrease as well. Interestingly, other defensive behaviors such as avoidance (running away) and boxing pose (standing on hind legs in defense) were unaffected. This implies that defensive behaviors and offensive aggression are mediated through different neuropathways.

Student
Bill Boulden, BS in Computer Science, BA in Music Composition

Advisors/Mentors
Peter Schmelz, Jonathan Golove

Title
Trichotomy (2nd movement of the Lobotomy String Quartet)

Abstract
A live or recorded performance of the second movement of the “Lobotomy String Quartet.” It is about three and a half minutes long and explores the idea of three different melodies (one pleasant, one dissonant, and one aggressive) that battle each other for the listener's ear. It was composed under the guidance of and has been approved by Prof. Jonathan Golove.

Student
Thomas DeTrinis, Harold Lewter, Bethany Moore

Advisor/Mentor
Maria S. Horne

Title
Promising Artists of the 21st Century (Costa Rica)

Abstract
On February 20, 2006, three outstanding students of the IACE Creative Research Lab and their professor traveled abroad as culmination of a journey that had taken over a year and a half of preparation. They were to be awarded the 2006 Promising Artists of the 21st Century in Costa Rica, a great honor that only eight major universities from the United States hold every year. Promising Artists of the 21st Century is a prestigious by-invitation-only annual series organized by Centro Cultural Costarricense-Norteamericano (C CCCN), under the sponsorship of the United States Embassy, multinational corporations and Costa Rican institutions. Conceived as a main intercultural program, the one-week residency in Costa Rica showcased the UB delegation at cross-cultural sessions with the Costa Rican artistic community. The students offered master classes and workshops at several national universities, conservatories, private institutions and renowned theatre groups; short recitals; and a sold-out professional performance at the Eugene O'Neill Theater. The original concept piece of work for this performance,
C-STEP Program (Collegiate Science and Technology Achievement Program)

Student
Mary Akuamoah-Boateng

Title
The Significance of Biological Imaging

Abstract
With this project, Dr. Swihart's group recently invented a method for preparing bright silicon nanoparticles that emit light that range through the whole visible spectrum (blue to red). Imagine your PDA for instance, the color displays are dependent on the properties of the particles used in its construction. Silicon is not the particle being used in PDAs but it has the potential to be this kind of Light emitting devices and also in biological imaging. Biological imaging has been shown to be important in discovering the cure for cancer. Current works in our laboratory are tailored towards making these potential applications feasible because Silicon particles have benefits over the current particles and compounds that are being used. The overall aim is to develop particles with a range of properties that make them suitable for use different applications.

School of Engineering and Applied Sciences

Quantum Conductance Across Single-Atoms

Student
Mark Huntington, MAE/Mechanical Engineering

Title
Quantum Conductance Across Single-Atoms

Abstract
In materials science and mechanical engineering the building blocks of the nano world are being investigated and the foundation is being laid for the practical application of modern physics and thus nano-technology. This is done by the study of how single atoms interact at a fundamental level and how they behave and interact in electrical and magnetic fields. To gain understanding, I have begun a project to explore the properties of point contacts – conductors made of a single atom or just a few atoms. Theoretical physics predicts, and has been shown that the conductance of electricity through such a contact should be quantized. The project I am currently working on involves studying these properties in Gold (Au) and Platinum (Pt). These experiments will not only have interesting results in themselves, but also provide a framework for future exploration into the world of the quantum.

Students
Kenneth Camann, Minsuk Cha

Title
Undergraduate Research Projects in Grid Computing

Abstract
We present a novel design and implementation of a virtual organization concept as applied to heavy-data dependent applications. We use solutions offered by an emerging area of grid computing. The application is a grid-based stock market virtual organization. Foundational concepts for the project and the project details will be presented in the form of a poster by Kenneth Camann, a senior level undergraduate student in the CSE department. This project is partially funded by a NSF CCLI A&I grant 0311473.

We have also developed a visual grid tutorial for dissemination of grid computing concepts to a variety of users from novices to advanced system developers. The tool presents grid computing concepts using under these three headings: executive summary, basic concepts and grid programming. This particular version of the tool called ViGOR1.0 (Visual Grid Tutorial) was developed by an undergraduate student Minsuk Cha, a senior level undergraduate student in CSE department. Minsuk will present this tool on his laptop. This project is partially funded by 2005-2006 Educational Technology Grant of University at Buffalo and by NSF CCLI A&I grant 0311473.

Student
Abhijeet Kohli

Title
Molecular cloning as a tool for Metabolic and Biochemical Engineering

Abstract
Cloning is one of the most versatile Biochemical Engineering techniques. It allows fast magnification of plasmid DNA and enables researchers to...
perform a number of modifications to it. I worked with Dr. Koffas and Dr. Andreadis to explore two very different modes of exploiting this technique.

My project with Dr. Koffas was aimed at producing flavanones, which are the common precursors of a large number of flavonoids. This was done through cloning of a four-step metabolic network that contained plant genes from heterologous origins. They were eventually introduced into Yeast strain through chromosomal integration.

In Dr. Andreadis’ laboratory, I was involved in a project which aimed at insulin delivery through skin cells for treatment of diabetes. I prepared retroviral constructs encoding for the insulin gene. These were used to transduce human skin cells. These cells are being used in experiments to quantify the reversal of diabetes.

Student
Ryan Lange, Department of Electrical Engineering

Title
Spectrograph Analysis of Plasma Generating Surface Flashover

Abstract
The goal of this research is to measure the intensity of each wavelength emitted by plasma generated from a pulse-powered surface flashover. This spectral data will allow the energy of the electromagnetic radiation, as well as the temperature of the plasma, to be determined. In order to tie the concept of surface flashover to applications such as: ignition sources, light sources and fuses, these characteristics of the plasma reaction need to be identified. The amount of energy released in the form of visible light and other electromagnetic radiation must be known in order to accurately assess the energy consumption of the surface flashover. Plasma is a blackbody; therefore a spectrograph must be used to determine which wavelengths of light are being emitted. A series of optical lenses are used to first collimate the light and then focus it on the entrance of the spectrograph. The light is then diffracted and the intensity of each wavelength is recorded by a Gated Linear CCD camera. Data is collected across the entire electromagnetic spectrum based on the capabilities of the spectrograph.

Students
David Keller, Charles Ekiert, Dept. of Civil, Structural and Environmental Engineering, Civil Engineering, (Minor in Architecture)
B-cell progenitors, a murine B-cell colony assay in semisolid media was validated by morphologic, immunohistochemical, and FACS analyses. The presence of B-cell progenitors was assayed in the yolk sac, fetal liver, fetal spleen, and bone marrow in timed mouse embryos. Preliminary results indicate that the spleen follows the liver in becoming a significant site for lymphopoiesis in the days immediately before birth. In contrast to previous reports, we found B-cell progenitors in the livers of embryos younger than 14.5 embryonic days (E14.5). In preliminary studies, B-cell progenitors were identified in the E10.5 yolk sac and embryo proper, but were not found in the respective tissues at E8.5. These results raise the possibility that the B-cell lineage arises prior to development of the fetal liver.

**Student**
Lesley Capuana, Psychology

**Title**
Reduced P300 Amplitude in Impulsive Aggressive Individuals

**Advisor/Mentor**
Dr. Rebecca Houston-Scientist at the Research Institute on Addictions

**Abstract**
The current study builds on previous findings of neurocognitive impairment in impulsive aggression (IA) by using well-defined criteria, excluding confounding psychopathology, and using a difficult visual task to elicit the P300 event-related potential. Analysis indicated reduced P300 amplitude in IA subjects. These results have implications for assessment, treatment, and intervention.

**Students**
Christopher L. Wirth, Marina Tsianou, Paschalis Alexandridis,
Department of Chemical and Biological Engineering

**Title**
Self-assembly of Surfactants in Aqueous Solution Modulated By Cyclodextrins and Alkanols

**Abstract**
The self-assembly of amphiphilic molecules has already produced, and has great potential to produce in the future, materials and products with unprecedented functionality for biomedical, electronic, catalytic and separation technologies. Central in all applications of self-assembly is our ability to control the molecular organization of the amphiphiles. Motivated by this, we consider the formation and structure of surfactant micelles in aqueous solutions in the presence of molecules that can interact with the surfactant or with the solvent water. In particular, we considered the solutions properties of the “model” surfactant sodium dodecyl sulfate (SDS) in the presence of cyclodextrins (CDs) and alkanols, by means of conductivity measurements.

**Student**
Balbir Singh, Comparative Literature

**Advisor/Mentor**
Shaun Irlam and Andrew Scott

**Title**
In the Heart of the Casbah: French Existentialism and Violent Decolonization in the Algerian Struggle

**Abstract**
I will explore the literary and theoretical relationship between the anticolonialist impulses of Frantz Fanon and the French existentialist writing of Albert Camus and Jean-Paul Sartre. The dialogue between Fanon's ferocious critique of European colonizers, particularly in The Wretched of the Earth, and the embodiments of modernist European intellectualism is central to this project. The Algerian struggle for independence from French colonial rule from 1954 until 1962 serves as a historical background, and issues of Orientalism, Arab identity, and Maghreb politics provide a geopolitical framework. I aim for a wholly postcolonial analysis, incorporating elements of race, ethnicity, language, and nationalism.
also embraced the challenge of designing an eye-catching poster display, showcasing communication and informatics concepts, specific degree requirements, the faculty, and the staff. The goal of this presentation is to make the University community aware of the undergraduate programmatic strengths of the School of Informatics.

Students
Natalia Grzebien, Kaileigh Hollowood, Matt Lazio, Casey Ruh, School of Informatics - Communication

Advisors/Mentors
Dr. Sawsan Tabbaa and Kim-Alla Swanton

Title
Muslim for a Day

Abstract
According to the Southern Poverty Law Center, the terrorist attacks of 9-11 caused a violent outbreak of hate toward Arab Americans and others perceived to be Arab or Muslim. Today, almost five years later, Arab Americans and Muslims still experience incidents of being yelled at, spat on, and discriminated against, often on a daily basis. Some students from the Intercultural Communication class at UB decided to experience what it would be like to be Muslim for the day to gain a deeper understanding of the prejudice that Muslims are encountering. Wearing traditional Muslim clothing the students did their usual daily activities of going to classes, shopping at the mall or having dinner at local restaurants. Only this time ... things were different.

Students
Tara Michaels, Angel Saint-Hilaire, Ryan Wool, School of Informatics—Communication

Advisor/Mentor
Kim-Alla Swanton

Title
Money, Money, Money, Money

Abstract
Donald Trump, BMWs, and bling are everywhere. Does that mean if you don’t have it, you can’t cut it? Students from the UB Intercultural Communication class decided to find out. They dressed for a day in “high style” and the next as people with not enough to get by. Then they watched the reactions.

LSAMP (LOUIS STOKES ALLIANCE FOR MINORITY PARTICIPATION)

Student
Charles Acheampong, Medicinal Chemistry

Advisor/Mentor
Dr. Gene Morse

Title
Drug Interactions among Antiretrovirals, Substances of Abuse and Traditional Medications in Resource-Poor Countries

Abstract
This project examined complex drug interactions in HIV-infected subjects in Zimbabwe where cannabis is the primary substance of abuse, and traditional medicine is also prescribed along with Nucleoside Analog Reverse Transcriptase Inhibitors (NRTIs) and Non-nucleotide RTIs (NNRTIs). The specific aims of this study were to: 1) Conduct antiretroviral pharmacology studies in Harare, Zimbabwe that are integrated by ongoing access to antiretroviral substance abusers; 2) Investigate TDM focusing on plasma NRTI concentrations and intracellular NRTI-tri-phosphate and NNRTI concentrations; 3) Determine ARV pharmacokinetics and pharmacodynamics in individuals also taking anti-tuberculosis medications, drugs of abuse (mainly cannabinoids and other traditional psychoactive substances used in these settings) and traditional African medicines (multi) compared to those without for insufficient drug exposure leading to toxicity.

Students
Carlos Buitrago, Eleftheria Antoniou

Advisor/Mentor
Dr. Paschalis Alexandridis

Title
Viscometric Investigation of Dextran Structure in Mixed Aqueous Polar Organic Solvents

Abstract
The conformation of biopolymers is of great fundamental and technological (e.g., pharmaceutical, food, and coating formulations) interest. The structure of polymers in solution is dictated by their inherent properties (e.g., chemical composition, molecular weight, and molecular architecture) but also by their surroundings (e.g., solvent quality, temperature). It is often desirable or advantageous to modulate polymer aqueous solution properties by addition to water of polar organic solvents and/or solutes. This project deals with the viscometric investigation of a polysaccharide, dextran, in aqueous or pure polar organic solvents (e.g., 25%ethanol, 100%formamide). The observed effects on the polymer intrinsic viscosity, coil radius, and overlap concentration, as well as the unperturbed dimensions have been evaluated and discussed in terms of solvent quality, molecular weight, polymer concentration, and temperature.

SCHOOL OF MANAGEMENT

Student
Jeremy E Campbell, School of Management/Marketing Undergraduate Honors Program

Advisors/Mentors
Debu Talukdar and Minakshi Trivedi

Title
An Empirical Investigation of the Pareto Principle in the Supermarket Industry

Abstract
The conventional wisdom of the Pareto Principle, more commonly known as the “80/20 rule,” has seen applications across a variety of contexts. Our study focuses on a market segmentation aspect which holds that about 80% of a firm’s sales come from only about 20% of its customers. Such “concentration” of sales revenue from a relatively small group of customers has obvious strategic implications for firms’ decisions regarding target marketing and customer service resource allocation. In this study, we conduct a detailed empirical investigation to investigate the robustness of the 80/20 rule at various levels of aggregation: (1) store level; (2) individual product category levels within a store; and (3) individual leading brands across various product categories within a store. The data used come from the UB Marketing Department’s Center for Relationship Marketing (CRM) data base and pertains to a leading Northeast US grocery supermarket chain.

RONALD E. MCN A I R  
SCHOLARS PROGRAM

Student
Stacy Bender

Advisor/Mentor
Dr. J. Gayle Beck

Title
Variables that Maintain PTSD after a Motor Vehicle Accident: Are Racial Differences Important?

Abstract
After a trauma, some people develop and
Abstract

Knockout Mice

Title

Impaired Detection of Social Olfactory Cues in Avpr1a Knockout Mice

Abstract

Normal social behavior relies on neuropeptides such as vasopressin acting at brain receptors. Vasopressin has two main brain receptors, the vasopressin 1a (Avpr1a) and vasopressin 1b receptors. Mice with disruption of the Avpr1a gene (Avpr1aKO’s) show deficits in social recognition. Social recognition depends on the animal’s ability to detect relevant social information. A recent investigation demonstrated that Avpr1aKO’s have olfactory deficits indicative of impaired detection of social information. We used an operant conditioning task to further evaluate olfactory acuity and sensitivity in Avpr1aKO’s. Mice were tested on their ability to discriminate between social odors (male and female urine), nonsocial odors (amyl acetate and water), and also their ability to detect a social odor (female urine) at decreasing concentrations. Our preliminary data indicate that Avpr1aKO’s show deficits in discriminating social, but not nonsocial, odors. These data suggest that one way Avpr1a impacts social behavior is through alteration of peripheral sensory function.

Student

Audra Foote, Department of Psychology

Advisor/Mentor

Dr. Rina Das Eiden; Senior Research Scientist

Title

Outcomes of Childhood Trauma in Substance Abusing Women

Abstract

We examined the associations among childhood experiences of abuse, current family instability, legal problems, and subsequent substance abuse in a community sample of cocaine and non-cocaine using women with 1 month old infants. On the basis of prior literature, we hypothesized that women who experienced greater childhood trauma would be more likely to engage in current substance abuse. We also expect that women with greater experiences of childhood trauma would have higher family/social problems and antisocial behaviors. We predict that these higher family/social problems and antisocial behaviors will be associated with greater caregiving instability. Knowing the relationship between childhood sexual, emotional, and physical abuse and later antisocial, family/social, and substance abuse problems is important for the creation of effective intervention programs. If key components are found in this relationship these factors should be considered and used when treatment is being given.

Student

Christopher A. Bailey, Psychology

Advisor/Mentor

Jamie M. Ostrov, Ph.D.

Title

Subtypes of Aggression and Media Exposure correlates in late adolescents

Abstract

Prior studies have indicated positive correlations between violent media exposure and physical aggression. The current study (N = 200) examines specific functions (e.g., proactive and reactive) and forms (e.g., physical and relational) of aggression associated with violent media exposure in emerging adulthood (i.e., college students). Participants completed self-report measures of media exposure (i.e., TV, movies, videogames, computer, and music) and aggression (i.e., proactive and reactive physical and relational aggression). Results indicate significant unique associations between reactive physical aggression and violent media exposure.

Student

Deanna Kimbrel

Title

Community Technology Centers in Buffalo, New York Urban Areas

Abstract

As technology increases and society becomes more information technology orientated, it is important for people to be digital literate. However, due to social and economic issues every person does not have the same opportunities to become information technology savvy. This discrepancy has become known as the digital divide. Most researchers believe that most communities are deprived from the tools and knowledge to become computer literate. In the journal article entitled “Narrowing the Digital Divide in Low-Income, Urban Communities, authors Norris and Conceicao describe the digital divide’s consequences as “At stake is whether individuals are able to participate fully in democracy, in their own communities and in today’s job market.” In other words without the tools to access technology properly many underserved communities will be left behind and unable to grow with the world socially and economically.

To reduce such barriers initiatives have been put into place. Examples of such are: Technology Opportunities Programs, Digital Promises and Community Technology Centers. This research involves an ethnographic study that explores the conditions, procedures and influences of community technology centers in Buffalo, New York urban areas.

Student

Jacklyn Farris, Department of Media Studies/Film Studies & Psychology

Advisor/Mentor

Carolyn Tennant
Title
That which yesterday was reviled today becomes cultural consumer-goods; consumption thus engulfs what was intended to give meaning and direction. – Lefebvre, 1971

Abstract
The biological basis of behavior in mammals is a complicated process and not fully understood. Previous studies have shown that the neuropeptide vasopressin plays a critical role in the social behavior of mice. Vasopressin has two receptors present in the central nervous system, vasopressin 1a receptor and vasopressin 1b receptor. Mice lacking function for either of these neuropeptide receptors show a decrease in social recognition, which is the ability to remember a conspecific upon a repeated encounter. This study looks further into this deficit in social memory by determining the duration of time a mouse with nonfunctional vasopressin 1b receptor maintains social recognition. With the establishment of a mouse model for abnormal social behavior, advancement in treatment may result for diseases with severe social impairment, such as autism.
**Title**

The Effects of Ibuprofen on the Duration of Aspirin-Induced Inhibition of Platelet Aggregation

**Abstract**

Authors: Lisa Rubin, Matthew Robson, Vernice Bates, Michelle Rainka, Fran Gengo, University at Buffalo; Dent Neurologic Institute, Amherst, NY

Background: A drug-drug interaction between aspirin (ASA) and Ibuprofen may inhibit the antiplatelet effects of ASA in secondary stroke prophylaxis.

Hypothesis: ASA 325mg taken 2 hours after Ibuprofen 400mg will exhibit an antiplatelet effect no greater than Ibuprofen alone.

Methods: Ten healthy subjects (6 male, 4 female; mean 27.8 y.o.) underwent three randomized treatment sessions: ASA 325mg, Ibuprofen 400mg, and ASA 325mg 2 hours after Ibuprofen 400mg. Venous blood was drawn during each session at baseline, 1, 2, 4, 6, 8, 24, 48, 72, 96, up to 120 hours until return to baseline. Whole-blood platelet aggregometry was measured (ohms) using collagen 1ug/mL, 5ug/mL, and arachadonate 0.5 uM.

Results: Antiplatelet effects of ASA and Ibuprofen were no different than Ibuprofen alone (Figure1). Data is being analyzed with repeated measures ANOVA.

Conclusion: Patients on ASA for secondary stroke prophylaxis should avoid taking Ibuprofen before ASA.

**Student**
Lisa Rubin

**Advisor/Mentor**
Fran Gengo, Pharm.D.

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**Title**

Fluorescent Based Assay To Monitor Intracellular Disposition of Protein Lipid Complex

**Abstract**

Lipidic particles and their uptake by cells are important as they alter several pharmacological and immunobiological processes for biomedical applications. The purpose of this study is to design fluorescence based assay to quantify lipidic particulate uptake by dendritic cells. A known concentration of the fluorescent probe Rhodamine-Phosphoethanolamine (Rho-PE) liposomes was added to immortalized dendritic cells (DCS), and incubated for 1 hr. The cells were lysed, and the concentration of Rho-PE was detected by fluorescence. The standard curve for Rho-PE labeled liposomes was found to be linear between the values of .200uM and 60uM. The recovery of Rho-PE liposomes from the dendritic cells was found to be less than 1.00%. The fluorescent-based assay is sensitive to detect liposome uptake, the minimal uptake may be due to the mature state of the DCS. This assay can be used to design lipidic delivery vectors and to investigate immunogenicity processes.

**Student**
Jenny Yang

**Advisor/Mentor**
Curtis Haas, Pharm.D.

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**Title**

Obesity due to early life diet modification: gene expression analysis

**Abstract**

Rearing rat neonates on a high-carbohydrate (HC) milk formula from postnatal day 5 onwards leads to hyperinsulinemia and adult-onset obesity compared with control animals. The mechanisms of this programming in response to the HC diet are currently being investigated. Quantitative real-time RT-PCR was used to study changes in mRNA expression levels of specific receptors in pancreatic islets and hypothalamus tissue. Receptors studied include those known to be involved in control of appetite, including the galanin receptor and leptin receptor, and also those involved in the activity of the autonomic nervous system, including the muscarinic M3 receptor. Real-time PCR analysis of fetal, 12-day-old, and adult rats showed significant changes in these receptors, suggesting that the autonomic nervous system may play a role in early metabolic programming, and that altered levels of receptors involved in appetite may be directly responsible for obesity in HC adults.

**Student**
Catherine Dodds, Paul Mitrani,
Department of Biochemistry School of Medicine and Biomedical Sciences

**Advisor/Mentor**
Dr. Mulchand Patel
Dr. Piero Bianco
Advisor/Mentor
Biochemistry

Abstract
The E. coli dnaN159 allele encodes a mutant form of the bacterial sliding clamp (159) that is impaired for interaction with the high fidelity bacterial replicative DNA polymerase, but not with the lower fidelity bacterial DNA repair polymerases. Since sliding clamp proteins are proposed to coordinate the actions of the cell's different DNA polymerases during DNA replication and repair, we hypothesized that 159 would confer a mutator phenotype. Our results indicate that the dnaN159 strain displayed a modest mutator phenotype that was considerably more pronounced on the lagging strand than it was on the leading strand. We are currently utilizing genetic approaches to further characterize the mechanistic basis for this mutator phenotype. Our findings are discussed in terms of a model to describe the role of sliding clamp proteins in coordinating protein traffic at the replication fork.

Student
Justin Bradfield, Department of Biochemistry

Advisor/Mentor
Dr. Piero Bianco

Title
Single molecule studies of the role of the HsRad54 protein in the synopsis stage of homologous recombination

Abstract
Rad54 protein is a complex recombination accessory protein with multiple activities. It is a prolific dsDNA-dependent ATPase, it stimulates homologous recombination performed by Rad51 with which it forms a stoichiometric complex, it alters DNA topology and is able to displace histones from dsDNA. These activities are consistent with Rad54 being a translocating motor that stimulates recombination by delivering dsDNA to Rad51 and displacing histones to facilitate the homology search and possibly stand exchange process. To gain insight into the role of Rad54 in homologous recombination, we have directly visualized (I), the interaction of human Rad54 (HsRad54) protein with dsDNA, and (II), the synopsis stage of recombination performed by HsRad54-HsRad54 nucleoprotein filaments (NPF) and homologous DNA. A combination of dual optical tweezers and real-time fluorescence, video-microscopy has been used to visualize reactions on optically-trapped, linear dsDNA 48 kb in length. Our movie results show that Rad54 oligomers rapidly translocate dsDNA. This is visualized as a decrease in DNA length, concomitant with the formation of condensed or collapsed DNA into the location of the Rad54 oligomer. In addition, Rad54 is able to stably crossbridge two, or more, dsDNA molecules, an activity relevant to its role during synopsis.

Visualization of single DNA molecule synopsis reveals that the interaction of individual NPFs with linear, homologous dsDNA induces a 161˚ bend in the target DNA. This bend correlates with the initial site of interaction between the NPF and the target DNA. The NPF is able to rapidly translocate along the length of the linear duplex molecule with rates as high as 30,000 bp/sec, and locate the site of homology. During the search for homology, the NPF rotates about the DNA duplex, consistent with the NPF tracking along the DNA helix. Once homology is located, HsRad54 translocates dsDNA into the location of the NPF, resulting in a shortening of the 48 kb target DNA.

These data are consistent with bulk-phase experiments demonstrating that HsRad54 has an early role in homologous recombination and stimulates DNA strand exchange at the coaggregate stage of the reaction. Here Rad54 forms a complex with DNA-bound Rad51 to create the active nucleoprotein filament. The translocation activity of Rad54 is used to assist Rad51 in rapidly searching for the site of homology by translocating DNA past Rad51. Multiple DNA molecules can be held in proximity by the cross-bridging activity of Rad54 to further stimulate the reaction.

Student
Stephen Slocum, Department of Biochemistry

Advisor/Mentor
Dr. Piero Bianco

Title
Characterization of ATPase activity of the Escherichia coli RecG protein reveals that the preferred DNA cofactor is Negatively Supercoiled DNA

Abstract
RecG is a member of the Superfamily II helicase family. It is necessary for efficient recombination and repair in vivo, where its role is the ATP dependent binding and subsequent regression of stalled replication forks. A coupled spectrophotometric assay was utilized to characterize the ATPase activity of RecG in vitro. The results demonstrate that the optimal cofactor for the hydrolysis of ATP is negatively supercoiled DNA. Furthermore, heparin trapping indicated that RecG is not a processive enzyme, consistent with the rebinding of the enzyme to the DNA cofactor being the rate limiting factor in the hydrolysis of ATP. Consistent with previous work, results show that on all DNA cofactors except poly dT, RecG is active as a monomer. Suprisingly, utilizing poly(dT) as a cofactor, the enzyme displays a Hill Coefficient of 3 for ATP binding. Finally, salt titration midpoint experiments indicate that the activity of the enzyme on single stranded, mixed base composition, DNA is stabilized by the presence of the E. coli SSB protein.

Student
Anthony Dakwar, Biomedical Sciences

Advisor/Mentors
Dr. Mary Anne Rokita, Dr Stephen Dewhurst

Title
Effect of transcriptional targeting on protein expression and immunogenicity of an HSV-1 amplicon vector encoding HIV-1 gag

Abstract
Herpes Simplex Virus type-1 (HSV-1) is characterized by broad tropism and the ability to transduce non-dividing cells, allowing it to act as an efficient gene transfer vector. Previous studies have shown that a replication-defective vector based on HSV-1 (“amplicon”) is especially useful because it is safe, encodes no viral immunomodulatory genes, and delivers DNA to antigen-presenting cells. We hypothesized that immune responses elicited by the HSV-1 amplicon vector will be augmented through transcriptional regulation of immunogen expression. Our objective was to determine the ideal transcriptional promoter that optimizes expression of HIV-1 Gag by a HSV-1 amplicon vector, and to determine whether increased levels of Gag expression result in stronger immune responses in vivo.

Seven HSV-1 Amplicon constructs encoding HIV-1 Gag were developed, each with a specific promoter. In vitro studies were conducted to confirm
protein expression of the seven HSV-1 amplicon DNA constructs. Next, the seven HSV-1 amplicon DNA constructs were injected into Balb/c mice via intramuscular route. In vivo analysis of Gag expression was conducted via ELISA. Preliminary results suggest that all seven constructs expressed HIV-1 Gag in vitro. In vivo Gag protein levels were highest under a modified CMV promoter containing an HTLV-1 enhancer (CMV-R).

**Student**

**Emily C. Waite**, Biotechnical and Clinical Laboratory Sciences/Biotechnology

**Advisors/Mentors**

Kate Rittenhouse-Olson, Ph.D., Mohamed K. Khan, M.D., Ph.D., Lajos P. Balogh, Ph.D., Bindu M. Nair, Ph.D., Mohamed S. T. Kariapper, Ph.D.

**Title**

Toxicity and Biodistribution of Composite Nanodevices Targeted to Tumor Microvasculature

**Abstract**

Poly(amidoamine) dendrimers are synthetic polymers with highly branched, spherical structures that can encapsulate therapeutic moieties to form composite nanodevices (CNDs). The specific aims of this research involve analysis of CNDs for in vitro screening process has been developed to test the toxicity of different CNDs before in vivo experiments using biotin labeled CNDs and fluorescent antibodies.

CNDs are targeted to tumors by exploiting the differences between tumor and healthy microvasculatures. RGD peptides have been shown to select for the alpha-v beta-3 integrin, an upregulated molecule on angiogenic microvasculature of tumors. Biodistributions of recently constructed RGD-functionalized CNDs are being analyzed in a mouse tumor model, to examine the level of targeting of CNDs.

The ultimate goal is to extend these studies to humans and develop a tumor specific composite nanodevices for improved cancer imaging and therapy.

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**SCHOOL OF PUBLIC HEALTH & HEALTH RELATED PROFESSIONS**

**Student**

**Naouki Murakami**, Exercise Science

**Advisor/Mentor**

Michele Youakim, Rehabilitation Science, SPHHP

**Title**

Sex Differences in Attentional Modulation of Visual Responses in Humans

**Abstract**

We have studied neurophysiological mechanisms of attention and attention disorders. We use scalp electrodes and EEG to measure visual evoked potentials from 8 brain sites during different attentional states: 1) while focusing on a small spot of light (Fixation state), 2) while waiting for the spot to come on (Ready state), and 3) while sitting idly in front of the screen (Idle State). During each state a stimulus was flashed on the computer screen that was used to measure the visual evoked potential. We found that the visual evoked response and the attentional modulation differed between males and females with and without ADD.

Project Investigators: Gregory Sherman, Peter Horvath, PhD, CDN, Harold Burton, PhD, John Leddy, M.D., Joan Dorn, PhD, Julie Winters, RD, CDN, Todd Backes MS

**Student**

**Gregory Sherman**, Biology

**Advisor/Mentor**

Peter Horvath, Ph.D.

**Title**

IRB Approved Title: Diet and Endothelial Function in Trained Athletes versus Sedentary Males.

**Abstract**

Examination on the effect of diet on blood vessel function and rate of clearance of fat in trained cyclists and sedentary males 18-40 years of age. Subjects are otherwise healthy individuals.

Subjects will come in for 3 visits to the lab. 1st visit includes the initial screening and, human consent. On the 2nd visit a VO2 peak test is conducted on a bicycle of their own or one provided to them. This test will allow us to measure oxygen consumption so that we can calculate maximum exercise capacity.

3rd visit subjects will consume a high-fat dairy-based shake; ~850 calories. Before and several hours after consumption of the shake finger prick blood samples of lipid profile and glucose, and an ultrasound of the brachial artery are obtained. This will help us study the effects of a diet and endothelial function in trained and untrained males.

**Students**

**Andrew Griffith**, Murakami Naoyuki, Exercise and Nutrition Sciences

**Advisor/Mentors**

Scott C. White, Ph.D.

**Title**

Effect of prolonged walking with extra weight on lower limb loading measures

**Abstract**

The literature proposes that Quadriceps fatigue is a potential cause of knee OA in the overweight. Fatigue of quadriceps with continuous walking may result in sporadic increases in loading measures with time, and greater variability of force magnitudes and rates resulting in cartilage micro-damage. This study investigated the effect that prolonged walking with and without extra weight on limb loading measures. Subjects (BMI < 30) walked for 32 minutes on a treadmill and then again with extra mass (BMI > 30). Peak loading force (F1) and its rate of rise (F1R) were calculated from vertical foot-belt forces at baseline and at 8-minute intervals. F1 changed for the weighted condition even though normalized to body mass. Changes in loading measures did not correlate to increased walking time. Understanding the relationship between limb loading, weight and fatigue may provide insight into the incidence and progress of OA for the overweight.
Abstract
Atherosclerosis is an inflammatory process that leads to plaque build-up in coronary arteries. This process is also linked to oxidative stress, whereby the production of reactive oxygen species (ROS) overwhelms natural antioxidant defenses. Ingesting a vegetable- soy-based diet, compared with a diet based in animal products, may inhibit the atherogenic process and reduce the high incidence of heart disease in this country. Exercise training may also reduce CVD risk. This study used overweight, at CVD-risk men as subjects to investigate the effect of 12 weeks of soy supplementation plus resistance exercise training on blood cholesterol levels and oxidative status. Group 1 resistance training only; Group 2, soy supplementation + resistance training; and Group 3, Animal protein supplementation + resistance training. Blood was analyzed for total cholesterol, HDL cholesterol, LDL cholesterol, triglycerides, markers of oxidative stress and C-Reactive protein, before, during and after the study. Preliminary results indicate a significant reduction in total and LDL cholesterol and markers of oxidative stress in subjects consuming soy vs. animal protein.

Students
Brian Cassick, Sean Smith, Patrick Mahaney, Peter Horvath, Donna Rossbach, John Leddy, FACSM, Joan Dorn, Joe Muscarella, Depts. of Exercise and Nutrition Sciences, Orthopaedics, Social and Preventive Medicine and Athletics

Advisor/Mentor
Dr. Peter Horvath

Title
Prevalence of Risk for Eating Disorders In a NCAA Division I Wrestling Program

Abstract
The purpose of this research was to investigate the eating behaviors of athletes engaged in a competitive collegiate wrestling program and determine their risk for an eating disorder. Twenty-six male wrestlers from a competitive Division I wrestling program completed the Eating Disorder Inventory 2 (EDI-2). Their scores were compared to normal controls after cut-off scores had been established for the three most relevant subscales of the EDI-2. Subjects scoring above the cut-off in any of the three scales were considered “at risk” for an eating disorder. Chi square analysis of the scores for the 26 subjects revealed that 6 wrestlers were determined to be “at risk” for an eating disorder compared to the 2.6 expected for the general population of college-aged males from the normative data provided in the EDI-2 manual. Subjects were significantly more likely to be classified as “at risk” if they were in the wrestler group.

SIGMA XI

Student
Daniel Stolzberg

Title
Effects of Sodium Salicylate on the Local Field Potential of the Auditory Cortex in Awake Rats

Abstract
Sodium salicylate is known to cause tinnitus like effects in rats as well as in humans in large enough doses. Sodium salicylate has been used in many experiments as an analogue to study the neurophysiological mechanism of tinnitus. Studies of this phenomenon have generally been carried out with anesthetized rats. Since tinnitus is a perceived phenomenon the anesthetized rat which is unable to perceive stimuli might not be the best model for such a study. To study this phenomenon in awake rats chronically implanted silverball electrodes were implanted in the auditory cortex of rats. A specially built sound transparent cage was built to restrain the rat during testing. Tones of varying frequencies and intensities were presented to the ear contralateral to the implant. The tone evoked potentials of the auditory cortex were amplified and recorded on a computer. Sodium salicylate was injected and data collected 2h and 6h later. Preliminary data shows an increase in the amplitude and sharpness of the evoked potentials while the rat is experiencing the tinnitus like effects of a sodium salicylate injection.
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.