

# Creative COLLABORATIONS

A CELEBRATION OF STUDENT-FACULTY WORKS

APRIL 24, 2008



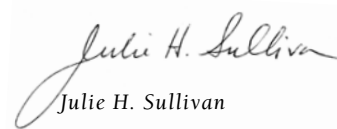
# Creative COLLABORATIONS

## WELCOME TO THE 3RD ANNUAL CREATIVE COLLABORATIONS CONFERENCE!

Today's celebration showcases the vibrant student-faculty interactions that are a hallmark of a USD education. Working side-by-side and engaged in intellectual pursuits with their faculty mentors, USD students gain lifelong experiences that extend far beyond the classroom walls. Each presentation made today, whether an art display, internship poster or research poster, illustrates how USD students go beyond learning about to learning to be.

I extend hearty congratulations to student presenters and faculty advisers for all that you have accomplished. The Creative Collaborations celebration has become an important tradition which enhances the intellectual life of the USD community and distinguishes us among its peers.

Sincerely,

A handwritten signature in cursive script that reads "Julie H. Sullivan". The signature is written in black ink on a light-colored background.

*Julie H. Sullivan*

Vice-President and Provost



## DIAMONDS AND DIRT

NICHOLE VALENZUELA

FACULTY ADVISOR: Alberto Pulido, Ph.D.

ETHNIC STUDIES PROGRAM

MEDIA: Collage/Poster (pictures, symbols, etc.)

SIZE: 40" x 40"

The purpose of this presentation is to explore, in a unique autobiographical sense, the life of a female student-athlete of color (Mexican) here at the University of San Diego. I will share some of my encounters of race, privilege and the many experiences of a “wound up” busy life. Tears, laughter and chaos are all part of my college life. Balancing practice, school and friends are just some of the things that an athlete will encounter. In creating my piece I will include pictures, symbols, words and many details to aid in portraying my life here at USD. I hope to share with others my experiences of race, religion, culture and the overall Torero life. I wish to portray what life is like not only being a student but also being Mexican, an athlete and a female. Softball is an interesting world that I would love to share with others. Welcome to my world.

## ETHICAL ISSUES IN SCIENCE AND SOCIETY: DEVELOPING AWARENESS AND FOSTERING DISCUSSIONS

**THERESA BISHOP**

FACULTY INTERNSHIP ADVISOR: LAWRENCE HINMAN, PH.D.  
DEPARTMENT OF PHILOSOPHY

I am currently a student intern with the Center for Ethics in Science and Technology. This internship allowed me to understand the ethical issues raised by the breakthroughs in science. I am fascinated by biomedical ethics as well as scientific advancements, such as stem cell research. I am committed to making a difference by becoming involved with bioethics and deciding the future of science. I assist in coordinating events, conferences, and seminars to help make the public aware of advances in technology and medical discoveries. These events include the Stem Cell Conference, the Computer Ethics Conference, the Neuroethics Week, and on MySpace: A Look at Privacy in Online Forums. The mission of the Center for Ethics in Science and Technology is to foster science in the public interest by promoting awareness, understanding and discussion of the ethical implications of new developments in science and technology.

## CONGRESSIONAL INTERNSHIPS

**HUGO CATALAN, JR.**

FACULTY INTERNSHIP ADVISOR: GARY GRAY, M.A.  
DEPARTMENT OF POLITICAL SCIENCE AND INTERNATIONAL RELATIONS

Congressional internships are an opportunity for students to see firsthand how one aspect of United States government operates. It also gives very good representation of how members of Congress interact with their constituents. The internship also sheds light on the important role of staffers and how they truly are an integral part of allowing the Congressperson to do their job. The internship teaches federal procedure, dealing with casework, and learning what happens “behind-the-scenes” in our Nation’s Congress.

## THE ART OF CIVIL RIGHTS: A COMMUNITY COLLABORATION

NELSON CHASE, ADAM OSORIO AND DERRON JUAREZ

FACULTY INTERNSHIP ADVISOR: ALBERTO PULIDO, PH.D.

ETHIC STUDIES PROGRAM

We are going to make a large poster discussing our experience working with the kids of CIMA (Communication Investigations in a Multicultural Atmosphere) on a civil rights mural. It will include pictures and other media showing our work with students teaching them about different civil rights leaders many of whom they have never heard of. Our civil rights leaders for our part of the project include Frederick Douglass and Fred Hampton.

## NAVAL CRIMINAL INVESTIGATIVE SERVICE: PREVENT TERRORISM, PROTECT SECRETS, AND REDUCE CRIME

JASON DUNBAR

FACULTY INTERNSHIP ADVISOR: GARY GRAY, M.A.

DEPARTMENT OF POLITICAL SCIENCE AND INTERNATIONAL RELATIONS

As an intern with the Naval Criminal Investigative Service (NCIS), I have been attached to the General Crimes Unit whose investigative responsibilities include narcotics, crimes against persons, property crimes, and family and sexual assault crimes. My role within this unit is to review domestic violence cases involving both Marine Corp and Naval personnel in which the incidents occurred off base. After obtaining the reports, I then follow NCIS protocol, which includes conducting a thorough background investigation on the suspect. Finally, once I have all of the information on the suspect, I create a classified report of the incident for the suspect's command and for NCIS Headquarters. I chose the internship with NCIS because I plan on pursuing a career within a federal law enforcement agency. Although many other agencies may offer similar internship opportunities, NCIS actually allows me to write official reports and assist agents in closing their caseload.

## CONNECTING COMMUNITIES THROUGH LEADERS

HANNAH EVANS, CLAUDIA TRUJILLO, ANA LARRANAGA AND  
RICARDO MORENO

FACULTY INTERNSHIP ADVISOR: ALBERTO PULIDO, PH.D.

ETHNIC STUDIES PROGRAM

Our job was to present civil rights leaders to students in the CIMA (Communication Investigations in a Multicultural Atmosphere) Program at San Diego High School, and to collaborate with the students in creating and painting a mural. Our role in the organization was to inform and educate the students about people who took a stand against injustices and positively influenced society through their actions and involvement in social movements. We hoped to inspire the students and show that by furthering their education, they too can make a difference and help stop social injustices. Through this project we were able to connect with our community, and in doing so, we were able to learn about its people and their stories. This experience has helped us get a better idea as to what we would like to do with our education once we graduate from the University of San Diego. Also, this experience gave us the opportunity to create relationships with CIMA High School students, and in interacting with them, we learned just how diverse of a community San Diego is.

## A DIETARY ANALYSIS OF ALBACORE TUNA OFF THE CALIFORNIA COAST

MICHAEL FOX

FACULTY INTERNSHIP ADVISOR: RON KAUFMANN, PH.D.

DEPARTMENT OF MARINE SCIENCE AND ENVIRONMENTAL STUDIES

My internship was at the Scripps Institution of Oceanography, a graduate school at the University of California San Diego. I assisted a Ph.D. candidate, Sarah Glaser, on a dietary analysis of albacore tuna. I worked as a volunteer research assistant, and my job was to examine the gut contents of albacore stomachs collected off the California coast. I was trained to identify vertebrate and otoliths from common species of fish albacore eat, as well as, squid beaks, eyeballs, euphasids, and crustaceans. Identifiable features were enumerated to quantify the contents of each stomach. This internship was extremely beneficial to me because it provided me with unique work experience in my future field as well as helping me gain a better understanding of what it takes to earn a Ph.D. in marine biology, something I plan on achieving in the near future.

## TBI MICRO-CREDIT STUDY

ANALISA FRANKLIN, EMILY LAWRENCE, AND ELISE VAUGHAN

FACULTY INTERNSHIP ADVISOR: DAVID SHIRK, PH.D.

TRANS-BORDER INSTITUTE

In an ever-expanding number of places, micro-credit lending or “microfinance” is being implemented as a tool for alleviating poverty and encouraging growth and development. As part of the Trans-Border Institute (TBI) Development Project, the TBI is studying the challenges of economic development in the U.S.-Mexico border region, with a focus on micro-credit lending in the San Diego-Tijuana border region. This study is being undertaken in collaboration with Los Niños, a non-governmental organization based in Tijuana, Baja California. Los Niños has developed numerous programs aimed at creating opportunities for individuals and families through community development and education. Working with USD students and faculty advisors for this project, TBI is conducting research to analyze and document the microcredit operations of Los Niños. This study will enable TBI to evaluate current strategies for implementing microfinance in Mexico and the border region, and, ideally, contribute practical suggestions for improving micro-lending practices.

## VISION ADJUSTMENT

MARCUS FUJITA

FACULTY INTERNSHIP ADVISOR: GARY GRAY, M.A.

DEPARTMENT OF POLITICAL SCIENCE AND INTERNATIONAL RELATIONS

The Trans-Border Institute (TBI) is an organization that promotes education through community-based activities regarding U.S.-Mexico relations. I am a staff member on the Justice in Mexico Project, which is sponsored by the TBI, and I assist the leader of the project, Robert Donnelly. My responsibilities consist of data research, database input and Web site updates. I chose this internship because U.S.-Mexico relations is a reoccurring theme in daily life here in San Diego, and educating people about the political and social aspects of a situation is necessary to prevent ignorance, which will ultimately promote proactive solutions. After this internship is done I would like to learn more about other countries' international relations, and use the skills that I have acquired to help promote healthy relationships between those countries.

## TRANSFORMATION THROUGH RESISTANCE

DARREN GRAYBEHL, LONDON HOUCHIN AND JENNIFER BUENROSTRO

FACULTY INTERNSHIP ADVISOR: ALBERTO PULIDO, PH.D.

ETHNIC STUDIES PROGRAM

We are working with four students from San Diego High School on a civil rights mural project that will honor social justice and develop an understanding and appreciation of the Latina and Latino experience in the Americas. Our group chose to research and analyze Malcolm X and Che Guevara as civil rights leaders in order to understand the transformative nature of these two individuals and what allowed them to have such an impact on their community and the world. We will make at least four trips to San Diego High School to help the students design and paint a mural of the civil rights leaders that the class has chosen. Our part in this project is to introduce the San Diego High School students to individuals that fought for equal rights and helped shape our history, and to encourage them to attend college. We will be making a poster for the creative collaboration conference to document and display our experiences with the students from San Diego High School.

## INVISIBLE CHILDREN

ANNE HOOLIHAN

FACULTY INTERNSHIP ADVISOR: GARY GRAY, M.A.

DEPARTMENT OF POLITICAL SCIENCE AND INTERNATIONAL RELATIONS

In the spring of 2003, three young filmmakers traveled to Africa in search of a story. What started out as a filmmaking adventure transformed into much more when these boys from Southern California discovered a tragedy that disgusted and inspired them, a tragedy where children are both the weapons and the victims. After returning to the States, they created the documentary “Invisible Children: Rough Cut,” a film that exposes the tragic realities of northern Uganda's night commuters and child soldiers. The film was originally shown to friends and family, but has now been seen by millions of people. The overwhelming response has been, “How can I help?” To answer this question, the nonprofit Invisible Children, Inc. was created, giving compassionate individuals an effective way to respond to the situation.

## THE ASSOCIATION BETWEEN SELF DISCLOSURE AND FEELINGS OF ISOLATION AND DEPRESSION IN COLLEGE FRESHMEN

HOLLY KOENEMANN AND KELLEIGH ELLISON

FACULTY INTERNSHIP ADVISOR: JENNIFER ZWOLINSKI, PH.D.

DEPARTMENT OF PSYCHOLOGY

Due to high prevalence of depression amongst college students, the relationship between self-disclosure (as means of coping), depression and social isolation was evaluated. The polarity of self-disclosure was also of interest. Self-disclosure, depression and social isolation were assessed using self-report questionnaires completed by 48 college freshmen in Introductory Psychology classes (38 female, 10 male). Zero-order Pearson correlations indicated a significant relationship between the following: self-disclosure and isolation, isolation and depression, and depression and self-disclosure. No type of disclosure was a better indicator of depression or isolation using multiple linear regression analysis. No gender differences were detected on the three scales as indicated by ANOVA. This supports developing research on self-disclosure and depression for ages 18-25.

## INTERNING AT THE FBI

WILLIAM MCGEE

FACULTY INTERNSHIP ADVISOR: GARY GRAY, M.A.

DEPARTMENT OF POLITICAL SCIENCE AND INTERNATIONAL RELATIONS

Since the beginning of my senior year I have been interning with the San Diego division of the FBI. The internship has been both humbling and rewarding. My duties have ranged from maintaining current and closed filing systems to escorting visitors around the building for various purposes. Amidst doing these tasks, I have been able to build relationships with numerous staff members with different positions within the bureau. The most recent project that I have been assigned to allows me to use the writing and comprehension skills I have gained through my political science classes to research information and generate summarized reports. By May of 2008 I will have completed 180 hours and gained a valuable perspective on what it might be like to work for the federal government and more specifically an intelligence agency within the federal government.

## INVESTIGATION OF INVASIVE ANEMONE SPECIES IN JELLYFISH LAKE, MICRONESIA, PALAU

KARA MILLER

FACULTY INTERNSHIP ADVISOR: MICHEL BOUDRIAS, PH.D.

DEPARTMENT OF MARINE SCIENCE AND ENVIRONMENTAL STUDIES

During the month of June I worked for Coral Reef Research Foundation in Palau, Micronesia. I participated in their marine lake-monitoring project in which we visited seven different marine lakes and measured hydrographic parameters, took photographs of various invertebrate inhabitants and collected samples. For the independent portion of the project, I studied an invasive species of anemone that recently showed up in the public marine lake to see if it was effecting the population of native anemones in the lake. I swam a series of transects to determine percent cover of the invasive anemone using a 1m<sup>2</sup> quadrat, and to observe whether it was excluding certain sizes of the native anemone. Since these were the first observations that had been made on this invasive anemone species, more research will be done in the future to further investigate the possible effects it is having on the lake ecosystem.

## THE KEY TO FREEDOM

SARAH MIRALLES, JOHN ALDINGER AND MICHAEL LUGO

FACULTY INTERNSHIP ADVISOR: ALBERTO PULIDO, PH.D.

ETHNIC STUDIES PROGRAM

John, Michael, and I are working with students at San Diego High School through the CIMA (Communication Investigations in a Multicultural Atmosphere) program. We are working on a collage to portray some of the struggles and hardships civil rights leaders had to face while fighting for freedom. Each student, both USD and SDHS, have contributed ideas and skills into this piece. Our theme is "The Key to Freedom" and our main focus is on Nelson Mandela.

## THE ROLE OF TOR IN DIABETES AND OBESITY

KATHRYN REARDON

FACULTY INTERNSHIP ADVISOR: MARJORIE PATRICK, PH.D.  
DEPARTMENT OF BIOLOGY

The mission of the Burnham Institute for Medical Research is to "conduct world-class, collaborative medical research to cure human disease, improve quality of life, and thus create a legacy for our employees, partners, donors, and community". As an intern at the Institute, I am involved in a project that is studying diabetes, obesity and the role that the TOR signaling pathway plays in these conditions. I personally assist in maintaining the growth of multiple lines of *Drosophila* and perform assays that measure the triglyceride and glucose levels of the flies under varied conditions. I am interested in pursuing a career in medical research and this internship provides valuable insight into the nature of this vocation. I have learned a great deal about the biology of *Drosophila*, obesity and diabetes and have also gained a better understanding of the scientific research process.

## CESAR CHAVEZ, SOCIAL JUSTICE AND THE DESIRE FOR A HIGHER EDUCATION IN ORDER TO CONSTRUCT GLOBAL DIFFERENCE

ANA RESENDIZ, CLAUDIA LLAMAS, CHRIS CUTHBERT AND BREE DE LA CRUZ

FACULTY INTERNSHIP ADVISOR: ALBERTO PULIDO, PH.D.  
ETHNIC STUDIES PROGRAM

Our presentation focuses on the experiences we have encountered with students in the CIMA (Communication Investigations in a Multicultural Atmosphere) program at San Diego High School. As we work together in the creation of a mural honoring civil rights leaders such as Cesar Chavez, our goal is to portray the positive impact civil rights leaders have made throughout history and to serve as constructive leaders in the world today. We complement the art skills of CIMA students by mentoring them in higher-education achievement. Through our example, it is our goal to represent the mission of the University of San Diego, to encourage CIMA students to employ their inalienable right for a higher education, and to continue our work for a constructive global difference.

## PROJECT CONCERN INTERNATIONAL: INTERNING AT AN INTERNATIONAL NGO

JAMIE ROBB

FACULTY INTERNSHIP ADVISOR: GARY GRAY, M.A.  
DEPARTMENT OF POLITICAL SCIENCE AND INTERNATIONAL RELATIONS

The mission of Project Concern International (PCI) is to prevent disease, improve community health and promote sustainable development. They work in many different countries including: Mexico, Bolivia, Guatemala, Nicaragua, Botswana, Tanzania, Ethiopia, India, the US/Mexico border, Zambia, Malawi, Indonesia, and are moving into areas of Chad as well. For my internship, I performed common tasks around the office, important research on funding initiatives, and collective data for all of our current and past programs to form a more dynamic, yet understandable summary to show to possible donors, government organizations (such as USAID) as well as individuals interested in becoming partners with PCI. I hope to learn the inner workings of a medium sized international nonprofit organization, as well as learning how funding is appropriated and the different programs that are implemented.

## THE POTENTIAL IMPACT OF THE FREE MARKET AND FOREIGN DIRECT INVESTMENT IN CUBA

JOSEPH SMITS

FACULTY INTERNSHIP ADVISOR: MANZUR RAHMAN, PH.D.  
SCHOOL OF BUSINESS ADMINISTRATION

As Cuba's communist regime becomes less and less viable, there is a growing need for the country to incorporate its economy into the world market. Due to the existence of a thriving black market and Cuba's history of entrepreneurship, privatization of the economy is a necessary and realistic step that the country must take in order to improve the lives of its citizens. Foreign direct investment should be considered not only to increase the amount of capital available for investment projects, but also to provide the necessary financial, technological, and managerial expertise to Cuban citizens themselves. Because Cuba has been in a period of de-capitalization for over a decade, foreign direct investment is the best means for reviving the country's economy and allowing it to emerge as a player on the world stage.

## IMPACTS OF AMMONIA ENRICHMENT ON PHYTOPLANKTON COMMUNITY STRUCTURE IN BAHÍA MAGDALENA

RAFFAELA ABBRIANO

FACULTY ADVISORS: MICHEL BOUDRIAS, PH.D., AND JAMES BOLENDER, PH.D.  
DEPARTMENTS OF MARINE SCIENCE AND CHEMISTRY AND BIOCHEMISTRY

Bahia Magdalena, located in Baja California Sur, Mexico, is an area of rich marine resources. A productive cannery operates on the shore, which releases its industrial waste into the bay. The cannery effluent is known to be a point source for nutrients, particularly ammonia. Ammonia concentrations have been measured at over a thousand times greater than typical background levels. The purpose of this project is to study how ammonia enrichment has the potential to effect the bay's natural phytoplankton populations. Field phytoplankton samples from a reference site were exposed to various concentrations of ammonia (0-0.50 mg L<sup>-1</sup>), and it was found to cause significant and immediate population growth, which was closely related to ammonia uptake. The specific changes in community structure due to ammonia uptake were investigated using pigment chromatography. Field samples from impacted and reference sites were compared via microscopy and related to the ammonia enrichment results.

## DEVELOPMENT OF A COMPREHENSIVE MODEL OF THE APPARENT VISCOSITY OF BLOOD

SPENCER ANDERSON

FACULTY ADVISOR: FRANK JACOBITZ, PH.D.  
DEPARTMENT OF MECHANICAL ENGINEERING

For this research project, a more comprehensive model for the apparent viscosity of blood was developed. The model was then applied to simulations of the microcirculation found in rat spinotrapezius muscle fascia. A model describing the effect of vessel diameter and hematocrit on the apparent viscosity had previously been developed by Pries, Secomb, Gaehtgens, and Gross (Circulation Research, 67, 826-834, 1990), but the shear rate dependence of apparent viscosity had not yet been included in the model. Using experimental data presented by Lipowsky, Usami, and Chien (Microvascular Research, 19, 297-319, 1980), a more comprehensive model was developed. A simulation of the microcirculation in rat spinotrapezius muscle fascia was created using realistic vessel topology reconstructed from microscope images. When the simulation was run and the equation was solved, it was found that the distribution of vessel length was log-normal, while the distribution of hematocrit was approximately normal.

## MEASURING GAS-PHASE GLYOXAL TO BETTER UNDERSTAND SMOG IN URBAN ENVIRONMENTS

GRACE BACHARACH

FACULTY ADVISOR: DAVID DE HAAN, PH.D.  
DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY

A method for measuring gas-phase glyoxal levels has been developed to aid the other lab experiments that focus on linking glyoxal to smog formation. This method begins with trapping glyoxal by sending it through a water bubbler. The glyoxal is then reacted with phenylenediamine to form quinoxaline. After this reaction has occurred a liquid chromatograph is used to separate quinoxaline from the other chemicals, and an absorbance detector is used to measure the amount of quinoxaline present. Currently, in this experiment it is being observed that when glyoxal trimer dihydrate powder is heated at low temperatures it generates mostly water vapor, and at high temperatures glyoxal in the gas phase is produced in large amounts.

## LEADERSHIP IN ACTION: A GUIDE FOR TODAY'S STUDENT BODY

A PROGRESSIVE AND COMPREHENSIVE MODEL WITH AN ETHNICALLY INCLUSIVE FOUNDATION

JOCELYN BEAVAN

FACULTY ADVISOR: ALBERTO PULIDO, PH.D.  
ETHNIC STUDIES PROGRAM

Leadership is the most powerful tool for a successful society. Leadership is at the core of educational principles offered at the University of San Diego. From business to education, the actual idea of leadership is abstract and can be implemented and taught in a number of ways. The purpose of my presentation is to compile various models of leadership on our campus and examine them by incorporating an Ethnic Studies Program perspective. I will present a review of leadership models and provide a new model of leadership from an Ethnic Studies Program perspective for discussion and review.

## THE IMPLICATION OF IMMIGRATION POLICY AND THE EFFECTS OF MACROECONOMIC FACTORS ON MEXICAN IMMIGRATION TO THE UNITED STATES

CASSIE BETTENCOURT

FACULTY ADVISOR: STEVEN SUMNER, PH.D.  
DEPARTMENT OF ECONOMICS

With a border almost 2000 miles long between Mexico and the United States, the issue of immigration has become increasingly important at border cities like San Diego. This particular international border is especially prone to investigation because it spans two countries with very different economies and regulations. Economies are often the most straightforward way to compare two countries, and they directly affect the people residing in them. United States policy that has the purpose of counteracting immigration must also be examined. My project will ultimately serve as a model for predicting the amount of Mexican immigration, both legal and illegal, to the United States in a given year. Using regression analysis, I will show how much immigration policy and macroeconomic variables affect Mexican immigration. I hypothesize that immigration policy is a relatively ineffective tool in comparison to the natural effects of macroeconomic factors in deterring both legal and illegal Mexican immigration to the United States.

## LIGNIN: THE SEARCH FOR GREEN PLASTICS

NOAH BRAUNER

FACULTY ADVISOR: PETER IOVINE, PH.D.  
DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY

Currently, the production of plastics is a process that leads to increased pollution in the form of carbon emissions and the depletion of the limited petroleum reserves in the world. The ability to partially or entirely substitute petroleum-based plastic polymers with a bio-based polymer, such as lignin, would lead to a decrease in petroleum demand and carbon emissions inherent in the production of plastics. However, a limiting factor in using lignin or lignin hybrid polymers as plastic alternatives is the poor mechanical properties of lignin. Our goal is to improve the mechanical properties of lignin by chemically modifying the polymer structure and subsequently blend these modified lignins with small portions of synthetic (petroleum based) polymers. In this paper we study the chemical modification of lignin with a class of small molecules known as boronic acids. The reaction and lignin interaction with these boronic acids was analyzed using infrared spectroscopy.

## GENERAL ATOMICS SCM TEST BOARD AND MODULE

EMLEY BROOKS, CHRIS ANESHANSLEY AND CHRIS LEFON

FACULTY ADVISOR: KATHLEEN KRAMER, PH.D.

DEPARTMENT OF ELECTRICAL ENGINEERING

The General Atomics team will design, build, and test a Secondary Control Module (SCM) Test Board Module. This will provide General Atomics an automated solution to ensure proper functioning of multiple parts of an aircraft. This includes the fuel, engine, left and right fuselage, and power connections that will be tested using a printed circuit board. The main goal of the SCM Test Board Module is to automate the testing process, which will allow simultaneous tests of multiple units and test the module thermally. The SCM Test Board Module design will be completed by the end of February, while the assembly and testing will be completed by May. General Atomics will provide all funding and supplies for this project. In the future, General Atomics may take what the team has accomplished with this project and automate those testing processes that today only test in a manual mode.

## IMPLICATIONS OF AMERICAN FOREIGN POLICY DURING THE SALVADORAN CIVIL WAR

LAUREN BYRNE

FACULTY ADVISOR: IRIS ENGSTRAND, PH.D.

DEPARTMENTS OF POLITICAL SCIENCE AND HISTORY

I am proposing a critical study of American foreign policy during the civil war in El Salvador. Understanding American foreign policy is important to recognize the positive and negative implications of U.S. involvement. Specifically, the Carter and Reagan administrations show how the fear of communism influenced U.S.-Salvadoran policies. A comprehensive knowledge of the outcomes of U.S. involvement, focusing on political, economic, historic, and religious outlooks will result from my research. It will also include evidence of political corruption from the right wing and the history of repression and social injustice in El Salvador. I feel there is irrefutable evidence to suggest that U.S. funding for the Salvadoran military aided in this corruption. Research methods have included a trip to El Salvador and speaking with various important figures, interviews of Salvadoran-Americans, and textual and multimedia resources. My Honors Program thesis will feature a documentary from my trip to El Salvador.

## A MEANS TO ADDRESS SOCIAL JUSTICE AND COMBAT INEQUALITY IN HEALTHCARE

ADA CARPENTER, KATHERINE KIRK, EMILY MIGNONGA, JOCELYN BEAVAN, JOHN HERRON, AND KRISTINA QUEZEDA

FACULTY ADVISOR: ALBERTO PULIDO, PH.D.

ETHNIC STUDIES PROGRAM

Regardless of race or economic status, every individual deserves equal access to healthcare. Unfortunately, in America, proper healthcare is unattainable for those who often need it the most. As an Ethnic Studies Program scholar, one must examine the inequalities of this system on the basis of race and ethnicity within larger social structure of society. By examining the intersecting consequences and influencing factors between race and healthcare, we can address one of the major issues facing our nation today. By organizing a community event evolving around the Cesar Chavez lecture at USD, we will bring in a local representative from the nonprofit, faith-based organization Interfaith Committee for Worker Justice. With this community contact, we hope to raise awareness and participatory action in the struggle for unbiased, affordable healthcare within the San Diego community.

## A BUSINESS PLAN: SPORTS SOCIAL NETWORK

KYLE CHAYKOWSKI

FACULTY ADVISOR: DANIEL RIVETTI, D.B.A.

DEPARTMENT OF FINANCE

I am putting together a detailed business plan of a service that will solve the problem that sports enthusiasts have no place to be linked together and coordinate outside games. It is important to my field of study because a business plan relates to the information that I have been taught in my business class as well as in my job experience. I plan to actually use this business plan to start a company after I graduate. I feel that my accounting major with an emphasis in finance is an important skill set that I have developed to help bring success to my business. Most of my research is done studying other companies' business plans as well as how companies similar to mine have developed such a strong company. I have been reading up on how to compose a strong business plan, one that would attract investors.

## GLOBAL HEGEMONY AND CHINA'S POTENTIAL RISE AS A SUPERPOWER

PENNY CHEN

FACULTY ADVISOR: LEE ANN OTTO, PH.D.

DEPARTMENT OF POLITICAL SCIENCE AND INTERNATIONAL RELATIONS

Long regarded as a political rival, China has become a target for those who feel that the United States is on the brink of losing its position as the global hegemon. For China to assume the position of the dominant superpower, it needs to demonstrate military, economic, and social solidarity and stability. Scholars who believe in China's eminent rise as the global hegemon cite the country's astounding growth. On the other hand, scholars who believe in the maintenance of U.S. domination warn against placing too much emphasis on economics. They cite statistics indicating that not only have China's military capabilities been exaggerated by sensationalists just like its economic strength, but most importantly, its rising social instability as embodied by the heightened tension between wealthy urbanites and the impoverished countryside, the combination of which seriously threatens its prospects of attaining superpower status.

## REACTIVE UPTAKE OF GLYOXAL BY ORGANIC AND SULFATE AEROSOL: SECONDARY ORGANIC AEROSOL FORMATION

ASHLEY CORRIGAN

FACULTY ADVISOR: DAVID DE HAAN, PH.D.

DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY

Secondary Organic Aerosols have been linked to causing detrimental health problems, aggravating pre-existing respiratory diseases, and intensifying urban haze. One pathway of SOA formation consists of a secondary pollutant, such as glyoxal, partitioning into the water layer of an existing solid particle. In urban areas, glyoxal is produced primarily during the atmospheric oxidation of aromatic compounds, while smaller yields are formed by the oxidation of biogenic isoprene and terpene. New particle chamber data demonstrates that glyoxal is involved in reactive uptake mechanisms during the formation of secondary organic aerosols. Experiments illustrate that monodispersed seed particles, such as amino acids, dicarboxylic acids and sodium sulfate, in the presence of glyoxal, experience rapid growth. It has been shown that the growth rate is a function of the seed particle's acidity, pKa. It is suspected that glyoxal is partitioning into the water layer of these acidic seed particles where it undergoes acid catalysis to form oligomers, causing the seed particles to grow. The data also suggests that glyoxal is reacting on the surfaces of amino acid particles, rather than partitioning into the water layer, based on the amino acids' very low mass fraction of water. It has been shown that glyoxal uptake onto a seed particle is influenced by acidity, nucleophilicity, and the presence of sulfate ions.

## INVESTIGATING THE BIOCHEMICAL AND BIOLOGICAL FUNCTION OF HISTONE ACETYLTRANSFERASE 1 (HAT1)

DEVIN CRANE

FACULTY ADVISOR: ROBERT DUTNALL, PH.D.

DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY

DNA, the genetic material that orchestrates cellular process including gene expression, cell division, cell specialization and responses to stimuli, is organized in a highly compact structure called chromatin. Changing chromatin structure, by modification of histone proteins that package DNA, allows the functions of DNA to be highly regulated. Histone acetyltransferase 1 (Hat1) is an enzyme that acetylates histones and is involved in regulating gene expression at telomeres, the linear ends of DNA molecules. This research characterizes the enzymatic activity of Hat1 with respect to chemical catalysis by examining the effect of specific amino acid substitutions. Amino acids for mutation are selected from analysis of a Hat1 crystal structure, and enzyme activity will be measured using a fluorescence based enzyme assay. A long-term goal of this project is to introduce Hat1 mutants into yeast cells to better understand the molecular basis and the biological function of Hat1.

## EVOLVING COMPUTER PROGRAMS FOR A LOCALIZED-INFORMATION NETWORK MAINTENANCE TASK

DARREN DAVIS

FACULTY ADVISOR: ERIC JIANG, PH.D.

DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE

Evolutionary algorithms utilize a predetermined encoding method to generate a population of potential solutions, then use a fitness measure to evaluate each member of the population. By probabilistically favoring successful individuals and applying operations such as reproduction, mutation and crossover, successively better populations can be created and effective solutions can be identified. Genetic programming is a relatively new but widely successful type of evolutionary algorithm that represents solutions as syntax trees of computer programs, allowing greater expressiveness and generality in solution representations. The current work uses genetic programming to create programs that traverse a network and use the information gathered to optimize connectivity through link placement. Solution probability, speed, stability, and variety are compared in isolated and co-evolutionary contexts. Such information supports empirical and theoretical investigations concerning practical issues in genetic programming, the problem-solving process of evolutionary algorithms, and the computational perspective of evolution.

## FROM SEPARATIST TO MILITANT JIHADI: THE EVOLUTION OF TERRORISM AND ITS IMPLICATIONS FOR INTERNATIONAL LAW ENFORCEMENT

JOANIE DIX

FACULTY ADVISOR: RANDY WILLOUGHBY, PH.D.

DEPARTMENT OF POLITICAL SCIENCE AND INTERNATIONAL RELATIONS

Terrorist acts have become increasingly apparent in recent years, cropping up around the globe. Progressively more violent and with a growing number of casualties, it is time for the global community to analyze the situation in a new light. My theory centers around two distinct but interrelated portions. First I am asserting that two distinct forms of terrorism exist in today's world: separatist and jihadist. Centered on this concept I am going to argue that these distinctive forms comprise fundamentally different threats to the law enforcement community. I chose to use Spain as a case study as there are both separatist and militant jihadi networks active presently. For a quantitative measurement I am going to compare the casualties and targets of the March 11, 2004 attack on Madrid and the July 7, 2005 attack on the London Underground. I will also compare the number of casualties and the type of victims involved in various attacks by Euskadi Ta Askatasuna (ETA), Spain's separatist group, and the train bombings of March 11, 2004. To measure the effectiveness of different law enforcement practices I will observe practices pre and post-March 11. I am also going to measure these differences after an attack perpetrated by ETA, such as the bombing of Barajas. Due to the speed with which the terrorist threat mutates, my research will serve as a snapshot of the current period, which others may use to describe future evolution. Hopefully this research will also be useful for law enforcement to use in conflicts concerning current terrorist activities.

## MOLECULAR ENGINEERING USING FERROCENE-BASED LIGANDS

ALEX DRU AND MICHELLE GRAU

FACULTY INTERNSHIP ADVISOR: MITCH MALACHOWSKI, PH.D.

DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY

Our interest is in designing organic molecules with particular shapes. In order to do this, we have synthesized rigid organic molecules based on the ferrocene unit. These organic molecules were designed to have a shape that will lead to a cavity when complexed to metal ions. After preparation of the organic molecules, they were bound to metal ions such as cobalt, iron and copper. The complexes were characterized by a combination of elemental analysis, mass spectrometry and X-ray crystallography. From these results, we were able to determine whether our basic premise about building particular shapes into the ligand is transferred to the metal complexes. We will highlight our successes using these ferrocene-based ligands.

## HEALTH THROUGH THE YEARS — A COMPREHENSIVE LOOK AT COLLEGE WOMEN'S HEALTH AT THE UNIVERSITY OF SAN DIEGO

BRITTANY ESTRADA

FACULTY ADVISOR: REGINA FLEMING, M.D.

USD HEALTH CENTER

The purpose of this exploratory study was to analyze how the health of a cohort of college women changes throughout their college career. In this study, the correlation between year in school and various facets of female mental and physical health were analyzed using the 2004 and 2006 National College Health Assessment Surveys. The goal of this analysis was to gain information about risk factors of women in college and to then endorse preventative treatments/practices that will help facilitate good women's health.

## ECOTOURISM: ASSESSING DESTINATION COMPETITIVENESS

WHITNEY FAROWICH

FACULTY ADVISOR: ANDREW NARWOLD, PH.D.

BUSINESS ECONOMICS

Tourism is one of the largest and fastest growing industries across the globe. Due to tourism's ability to transfer dollars among countries, many developing countries heavily rely on these tourism dollars to sustain their economies. A large percentage of these economies are in Central and South America, where many countries have currently carved a successful niche for themselves in the ecotourism sector. Cultural experiences and adventure activities are integrated throughout every activity, with the intention that the tourist enjoys the country in the most authentic manner possible. What Latin America is trying to create and sell is sustainable travel. The International Ecotourism Society defines ecotourism as "responsible travel to natural areas that conserves the environment and improves the well-being of local people." Latin America wants to bring the tourist and its profits in, yet minimize impact on the natural resources, while generating cultural and environmental awareness. The challenge here is to determine what factors make a destination more competitive than others, and thus more profitable, while at the same time maintaining sustainability.

## IMPLICATIONS OF FEMINIST THEORY IN THE UNITED STATES AND CHILE

AMANDA FISK

FACULTY ADVISOR: NOELLE NORTON, PH.D.

DEPARTMENT OF POLITICAL SCIENCE AND INTERNATIONAL RELATIONS

My research explores the relationship between models of feminist theory evident in the laws of different countries and the result of such legislation on the lives of women. I have based my research on the United States, which has based most of its laws on a form of feminism favoring equality, and Chile, which has relied more on a form of feminism favoring special rights. I will measure the quality of women's lives in different respects to determine the strengths and weaknesses of each kind of feminism in its practical application. This research is important in the study of feminist theory because it shows the practical results of feminist policy. This research is also significant because it shows the importance of culture in the international marketing and development of women's rights. In the future I would like to study the potential for new feminist movements in the two countries.

## COMPARISON OF SEDIMENTATION IN BAYS AND REEFS BELOW DEVELOPED VS. UNDEVELOPED WATERSHEDS, ST. JOHN, U.S. VIRGIN ISLANDS

MICHAEL FOX AND KARA MILLER

FACULTY ADVISOR: SARAH GRAY, PH.D.

DEPARTMENT OF MARINE SCIENCE AND ENVIRONMENTAL STUDIES

Sedimentation stress is one of the most serious threats facing coral reefs today. On the island of St. John, U.S. Virgin Islands, unregulated terrestrial development has resulted in high sedimentation stress and large-scale degradation of local reefs. This study aims to quantify the differences in sediment flux rates in bays below both developed and undeveloped watersheds and to compare bottom samples and substrate cover to data collected 20 years ago. Sediment flux rates were quantified by sediment traps that were constructed and deployed in August 2008. Bottom samples were then taken along transects to characterize the bottom sediments with increasing distance from shore. My personal task was recording video transects of the substrate cover along each transect. I will analyze the videos by a random point estimation method to determine relative percent cover of different substrate categories. Preliminary data shows sediment flux rates are 1 to 51 times higher below developed watersheds.

## MULTIPLE SENSOR KINASES REQUIRED FOR ENCYSTMENT IN RHODOSPIRILLUM CENTENUM

CHRIS FREDERICK AND CAITLIN FORSYTHE

FACULTY ADVISOR: TERRY BIRD, PH.D.

DEPARTMENT OF BIOLOGY

Rhodospirillum centenum is a purple photosynthetic bacterium that is capable of transforming into a metabolically dormant cyst when starved for nutrients. Although several other bacteria species have also been shown to form cysts, the signaling pathway that initiates the encystment process is not yet defined. In the present study, we created strains with knockout mutations in two different sensor kinase genes that are known to affect encystment. We then studied these mutants by observing colony and cell morphology, and measuring the expression of a reporter gene that is normally activated at an early stage of cyst development. Initial results suggest that disruption of one of the sensor kinase genes abolished cyst formation, while disruption of the other sensor kinase reduced the encystment response relative to the wild type. These results suggest that the signal pathway that leads to encystment in R. centenum is complex and integrates multiple sensory inputs.

## CRITICAL PEDAGOGY OF AIR: EDUCATIONAL KNOWLEDGE IS POWER

CHRISTY GARCIA

FACULTY ADVISOR: MICHELLE JACOB, PH.D.

ETHNIC STUDIES PROGRAM

Drawing from nearly two years of participatory action research, my study describes and analyzes activities of the American Indian Recruitment Programs (AIR), a tutoring and mentoring program that serves American Indian youth. Ethnographic data reveals that AIR uses a pedagogical approach I have named: EKP (Educational Knowledge = Power). Traditional cultural values guide EKP, as AIR seeks to empower youth to attain higher education in order to become prepared community leaders. EKP responds to social conditions, which present native youth with limited resources to be successful in their educational pursuits. My study provides valuable insight into the workings of an organization (AIR), which seeks to address American Indians' low educational attainment rates. Additionally, my study is important Ethnic Studies Program scholarship because it gives voice to a marginalized community while simultaneously providing social context for the community's problems. Future research is needed to assess the program's long-term impact among AIR graduates.

## THE PHYSIOLOGICAL CONDITION OF ANTARCTIC KRILL, EUPHAUSIA SUPERBA

DANIELLE GARCIA

FACULTY ADVISOR: RONALD KAUFMANN, PH.D.

DEPARTMENT OF MARINE SCIENCE AND ENVIRONMENTAL STUDIES

Antarctic krill, *Euphausia superba*, is a keystone species in the Antarctic marine food web. Krill associate with ice surfaces for protection and food. Recent climate change has led to increasing numbers of free-drifting icebergs in the Southern Ocean. Krill close to icebergs should have increased access to food compared to those farther away. *E. superba* were collected near two icebergs, one large and one small. Two metabolic enzymes, lactate dehydrogenase (LDH) and citrate synthase (CS), were studied as indicators of physiological condition. Body length and gut fullness also were measured. Near the smaller iceberg, LDH rates were similar and CS rates higher in krill collected 0.2 km vs. 9 km away, while near the larger iceberg, LDH rates were slightly higher and CS rates lower at 0.2 vs. 9 km away. Krill collected closer to the icebergs generally were larger with fuller guts than those farther from the icebergs.

## INTRODUCTION TO HOLOGRAPHIC DATA STORAGE

HEATHER GARDINIER

FACULTY ADVISOR: SUSAN LORD, PH.D.

ELECTRICAL ENGINEERING PROGRAM

This report examines the principles and methods behind holographic data storage. Its purpose is to explain the optical technology behind holograms and how this technology can be used for data storage. A hologram is a complete record of information about a scene. When a hologram is properly illuminated it generates a virtual image that in every respect replicates the original scene. A hologram can be computer generated using a Fourier-transform hologram model. This model mathematically predicts every aspect of the scene and generates a computer image without the actual presence of the scene. Holographic versatile discs use computer-generated holography to store data on a disc. Holographic versatile discs store data in the volume of the disc, while other types of data storage discs only utilize their surface area. Therefore, holographic discs have the largest storage capacity available on the market.

## TBI JUSTICE IN MEXICO PROJECT

RUTH GÓMEZ, LORIE LÓPEZ AND MARCUS FUJITA

FACULTY INTERNSHIP ADVISOR: DAVID SHIRK, PH.D.

TRANS-BORDER INSTITUTE

The TBI (Trans-Border Institute) Justice in Mexico Project promotes analysis, dialogue and policy solutions to address a variety of urgent problems related to justice sector reform and the rule of law in Mexico and the U.S.-Mexican border region. The Justice in Mexico Project has the following major activities: generating new research on rule of law related topics; producing new research on criminal law and legislative reforms on penal codes at the sub-national level through a collaborative work with the Centro de Investigación para el Desarrollo, AC (CIDAC) based in Mexico City known as Red de Justicia; distributing publications, specializing on the analysis of justice reform alternatives and focusing on the evaluation of the rule of law in Mexico; organizing seminars, conferences and events to discuss related topics; and preparing relevant data and news summaries on rule of law indicators in Mexico.

## COMPUTATIONAL DESIGN OF THERMODYNAMICALLY STABLE BOROXINE HETEROTRIMERS

CHARLES GYSELBRECHT

FACULTY ADVISOR: JEREMY KUA, PH.D.

DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY

Boroxines, the dehydration product of organoboronic acids, have recently been found to form stable Lewis acid-base adducts with nitrogen-containing ligands. Arylboroxine structures have been used to build permanently porous organic frameworks with high thermal stabilities and surface areas. A boroxine is formed by the condensation reaction of three organoboronic acids to form a cyclic boroxine core. In the absence of a Lewis base ligand, the thermodynamic equilibrium favors the reactants. When this ligand is present, the reaction shifts to the forward direction. Until recently, this Lewis base ligand has always been external to the resulting adduct, forming an aryl-boroxine product with three identical substituents. Our computational study reveals that the presence of an internal amine ligand favors products with unique aryl-substituents. The viability of this design has recently been confirmed by their synthesis and identification. This poster will focus on the thermodynamic stability of these heterotrimeric boroxines, and explore what kinds of substituents appear to have the greatest stabilizing effect on the overall structure.

## MAKING MATH MORE APPROACHABLE: THROUGH CHILDREN'S LITERATURE

WHITNEY HANDY

FACULTY ADVISOR: JANE FRIEDMAN, PH.D.  
DEPARTMENT OF MATHEMATICS

Let's face it: math can be intimidating. Math can be especially scary to young students who are too shy to raise their hands and ask questions. Teachers all over the world are constantly looking for new ways to make math more fun and enjoyable for students. One approach is to integrate mathematics and children's literature. Picture books can be less intimidating than word problems, and can provide an engaging context to introduce and practice mathematical concepts. 365 Penguins is a great book, which can be used to integrate math with science and literature. In particular it can be used to introduce arithmetic progressions. In this project we develop lessons for elementary school children based on 365 Penguins. Our goal is to show students that math can be connected to all subjects in school; that it is really useful. Most importantly, we want to show that math isn't something to be afraid of!

## DOES GLYOXAL EVAPORATE FROM CLOUD DROPLETS?

SEAN HANLEY

FACULTY ADVISOR: DAVID DE HAAN, PH.D.  
DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY

Glyoxal is produced in high yields during the atmospheric oxidation of aromatic compounds, and in lower concentrations from isoprene and terpene oxidation. Glyoxal is absorbed efficiently into atmospheric water droplets, reaching average concentrations of 2-100  $\mu\text{M}$ , depending on the location. Results from recent particle chamber data show that glyoxal forms oligomers rather than transferring into the gas phase. A new method to determine the absorption of glyoxal into phenylenediamine solutions, forming quinoxaline, is being used to measure the amount of glyoxal released by evaporating cloud droplets. Artificial cloud droplets then will also be tested to determine the evaporation of water and the size of glyoxal particles left in the solid phase.

## THE HYPERFINE STRUCTURE OF IODINE

SEAN HANLEY

FACULTY ADVISOR: GREG SEVERN, PH.D.  
DEPARTMENT OF PHYSICS

Through the use of saturation absorption spectroscopy, the hyperfine structure of Iodine ( $\text{I}_2$ ) will be examined. The goal is to identify new lines in the spectrum of molecular iodine using hyperfine interactions as a guide to distinguish between possible candidates. The specific transition we are interested in is in the B-X system of lines. We want to determine which B-X transition makes the feature of interest at 668.613nm. Making an identification of this particular line could significantly increase the precision of measurements depending on it.

## THE DISCOVERY AND REVELATION: TABOO TOPICS OF COLLEGE FRESHMEN ROOMMATES FOUND IN THE EXPOSURE OF SOCIAL PENETRATION THEORY AND PERCEIVED LEVELS OF FELT INTIMACY

JENNIFER HARDING

FACULTY ADVISOR: JONATHAN BOWMAN, PH.D.  
DEPARTMENT OF COMMUNICATION STUDIES

The present study uses Altman and Taylor's Social Penetration Theory and the concept of perceived intimacy to explain, predict, and describe the nature of disclosive interactions within close relationships. The current research focuses on interactions among college roommates, centering on the revelation of taboo topics during emotionally intimate exchanges. Participants for the pretest include 25 sophomores, juniors, and seniors at the University of San Diego. The main survey includes items drawn from the open-ended pretest, as well as various measures of closeness and intimacy, as administered to 100 male and female freshmen at the University of San Diego. The study will elucidate the most common taboo topics of college freshmen roommates, while exploring the idea that perceived intimacy is positively related to the disclosure of taboo topics and/or the revelation of personal information.

## VIASAT RACE ACROSS AMERICA BROADCASTING SYSTEM (VRBS)

KATRINA HEARN, HEATHER GARDINIER AND CHRISTINE OLMSTEAD

FACULTY ADVISOR: KATHLEEN KRAMER, PH.D.  
ELECTRICAL ENGINEERING PROGRAM

The design of this project, named ViaSat Race Across America Broadcasting System (VRBS), integrates a communication system, a camera system, and an audio system. The project is intended to serve the needs of the ViaSat cycling team that will compete in the Race Across America (RAAM) in June 2008. The project is a collaboration of three senior electrical engineers, two engineering faculty, and several engineers from ViaSat, Inc. The communication system design provides the capability of broadcasting information via two alternative methods of communication: satellite-based and cellular. The camera system design implements a rooftop mounted camera that will provide quality footage for the Web site and ease of use for the broadcasting crew. The audio system design will provide the capability of adding audio commentary from the broadcasting crew to the video footage.

## THE POLITICAL JUDGE: HOW ELECTIONS AND MONEY AFFECT THE QUALITY OF JUDICIAL CANDIDATES

CHRISTOPHER HEINSEN

FACULTY ADVISOR: DEL DICKSON, PH.D.  
DEPARTMENT OF POLITICAL SCIENCE AND INTERNATIONAL RELATIONS

The research project will gather data to demonstrate that there has been an increased effectiveness of the dollar in nonpartisan judicial campaigns. This will raise the question of whether or not this increased value of the dollar translates into more information, which in turn, increases ideological identification cueing. This paper wishes to address the question of whether the electoral process, by its very own nature, works to “politicize” a nonpartisan race that should be based on qualification and quality, but instead turns on ideas and politics. Does money work as the medium that allows more “political” information to be dispersed, which, eventually turns nonpartisan elections into partisan ones?

## MECHANISM OF THE FERRIC UPTAKE REGULATOR PROTEIN IN SHEWANELLA ONEIDENSIS

SHAYNA HERSKOVIC

FACULTY ADVISOR: STEPHEN MILLS, PH.D.  
DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY

The Ferric Uptake Regulator (Fur) Protein has been found to regulate the uptake of metals in bacterial organisms. Various conformations in the active sites of the Fur protein as well as conformations in secondary structure can alter the affinity for a specific metal. In order to understand how the Fur protein works, we will analyze the amino acids involved in metal uptake. Instead of manually introducing mutations and seeing how these mutations affect metal binding and affinity, we can look at Fur homologues from different bacteria. It is believed that the Fur protein in *Shewanella oneidensis* changes the oxidation state of metals, resulting in metals that are less soluble, which would in turn mean that they pose less of a threat to the environment. This makes *Shewanella oneidensis* a suitable organism for studies in bioremediation. Our research aims at understanding the mechanism by which the Fur protein binds various metals.

## UPCONVERTING Er<sup>3+</sup> AND Yb<sup>3+</sup> DOPED LaF<sub>3</sub> NANOPARTICLES AS HEAVY METAL SENSORS

ERICA HEWITT

FACULTY ADVISOR: JAMES BOLENDER, PH.D.  
DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY

The exploitation of the unique optical and physical properties of nanometer-sized and lanthanide-containing materials for biological and analytical applications constitutes a fascinating area of research. The unique optical properties of Er<sup>3+</sup> and Yb<sup>3+</sup> doped LaF<sub>3</sub> nanoparticles make them ideal candidates for sensors of heavy metals in aqueous solutions. Er<sup>3+</sup> and Yb<sup>3+</sup> doped LaF<sub>3</sub> nanoparticles will be synthesized following van Veggel et al. 2005, and their optical properties characterized. Additionally the dopant ion concentration dependence on erbium upconversion in the nanocrystals will be examined using fluorescence spectroscopy. Once upconversion in the nanoparticles is understood, their ability to sense various heavy metals in solution will be studied by monitoring luminescence quenching. Finally, the nanoparticles' ability to sense heavy metals in aqueous field samples will be explored.

## IDENTIFICATION OF A Na<sup>+</sup>/H<sup>+</sup> EXCHANGER PROTEIN (NHE) IN *O. TAENIORHYNCHUS* LARVAL POSTERIOR RECTUM AND QUANTITATION OF ITS GENE EXPRESSION IN VARYING SALINITIES

DOMI HODKO

FACULTY ADVISOR: MARJORIE PATRICK, PH.D.  
DEPARTMENT OF BIOLOGY

The mosquito *Ochlerotatus taeniorhynchus* has a larval form that can withstand a wide range of salinities between 0 to 300‰ seawater. This mosquito species has evolved a posterior rectum, which allows the mosquito to regulate its ionic concentrations in the hemolymph. The specific mechanism by which Na<sup>+</sup> is removed from the posterior rectum is not well characterized. An H<sup>+</sup>ATPase was previously identified in the posterior rectal epithelial membrane, which pumps H<sup>+</sup> from the posterior rectum into the rectal lumen. It is proposed that this H<sup>+</sup>ATPase pump is coupled to a transporter protein in the same membrane that pumps excess Na<sup>+</sup> cations out of the cell, the Na<sup>+</sup>/H<sup>+</sup> Exchanger-3 (NHE3). The poster will include data that identifies the NHE gene sequence using two techniques called 5' and 3' RACE and will demonstrate the localization of the expression of this NHE-3 gene in the posterior rectum from the data obtained by a technique called qRT-PCR.

## A NEW EXPERIMENT FOR THE RESOLVING POWER OF A MULTI-SLIT GRATING INVOLVING RAYLEIGH'S CRITERION, DESIGNED FOR THE LOWER DIVISION PHYSICS CURRICULUM

JESSICA HOFFMANN

FACULTY ADVISOR: GREG SEVERN, PH.D.  
DEPARTMENT OF PHYSICS

A new experiment that examines the spectral resolving power of multi-slit apertures is described, which is designed for use in the curricula of lower division university level physical science. The experiment involves the use of lasers of different wavelengths mixed with a beam splitter. The combined beams impinge on a multi-slit aperture, and the peaks for the various interference maxima are measured and compared with Rayleigh's Criterion. Multi-slit apertures are used to resolve fine spectral features in light emitted from atomic and molecular light sources, and they played a major role in shaping quantum theory, and yet very few lower division experiments lead students to consider the resolving power of such simple systems.

## DISMANTLING GENDER RELATED VIOLENCE IN SAN DIEGO COUNTY

KARA KIMBALL, LEANNE PRATT, ANGELA LOPEZ, LAUREN ALESSI, JYOTHSNA KONDA AND CHRISTINE HOLLOWAY

FACULTY ADVISOR: ALBERTO PULIDO, PH.D.  
ETHNIC STUDIES PROGRAM/DEPARTMENT OF SOCIOLOGY

As a group, we are making contact with local organizations that work to dismantle gender related violence in San Diego County. We aim to work with organizations such as YWCA San Diego, whose goal is to eliminate racism and empower women through existing programs, as well as potentially working with the Methodist Federation for Social Action. While we are still in the beginning stages of organizing with these groups, our aim is to further research these organizations, set up a partnership with the organizations and speak on their behalf at USD to further the goal of ending violence based on gender and race.

## THE PREPARATION AND STUDY OF NOVEL BIPHENYL-BASED LIGANDS AND THEIR METAL COMPLEXES

STEPHANIE KISHBAUGH, KAREY KOWALSKI

FACULTY INTERNSHIP ADVISOR: MITCH MALACHOWSKI, PH.D.  
DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY

Many chemists have become interested in making compounds that link together discrete mononuclear complexes into arrays of molecules. The work is part of a field called supramolecular chemistry. In this project, we have prepared a series of organic compounds that contain biphenyl rings with either one or two distinct binding sites for metal ions. After synthesis and characterization of the organic portion, discrete mononuclear copper and cobalt complexes were prepared and characterized. In the future, these building blocks will be connected together with silver ions or other metals to form supramolecular complexes. These complexes will be characterized by a combination of elemental analysis, mass spectrometry and X-ray crystallography. The ability of the complexes to form supramolecular arrays will be determined and additional complexes will be synthesized based on these results.

## RELATION BETWEEN STRESS, HEALTH HABITS, AND SELF-ESTEEM IN MALE COLLEGE STUDENT ATHLETES AND NON-ATHLETES

AUBREY KLAICH AND DEENE KABILING

FACULTY ADVISOR: JENNIFER ZWOLINKSI, PH.D.

DEPARTMENT OF PSYCHOLOGY

This study examined the health habits, self-esteem, and perceived stress levels of male college student athletes and non-athletes using a correlational survey design. The sample was primarily composed of first year male college students (N=43) who were recruited through the Introduction to Psychology subject pool and the university football team. The study aimed to investigate a possible relationship among the variables of stress, health habits, and self-esteem across these groups. All participants completed a demographic sheet, the Perceived Stress Scale (PSS), the Health Habits Scale (HHS), and the Rosenberg Self-Esteem Scale (RSE). Results were analyzed using a Pearson's zero order correlation and Analysis of Variance (ANOVA). Data analysis revealed that there were no significant differences across groups for the assessed variables with the exception of the self-reported health habits: athletes reported practicing better health habits than non-athletes. These findings will enhance our understanding of the experience of stress for the college student and aid in the development of intervention programs to help students, specifically student athletes, to effectively cope with stress in their environment.

## CULTURAL REPRESENTATIONS OF VIOLENCE AMONG COLOMBIAN YOUTH: AN ANALYSIS OF THE NARRATIVE DISCOURSE IN THE NOVELA SICARESCA

MACKENZIE KLEIN

FACULTY ADVISOR: KEVIN GUERRIERI, PH.D.

DEPARTMENT OF LANGUAGES AND LITERATURE

The Sicaresca genre was a term coined in 1995 by Colombian author, Héctor Abad Faciolince, to refer to a literary categorization that proliferated in Colombian fiction during the 1990's. The term sicaresca derives from the word sicario; the child hit man or adolescent assassin for hire, whose translation into literature serves as a depiction of one of the most violent and unscrupulous microcosms extant in Colombian society. The figure of the sicario emerged out of the violence, corruption and widespread drug trafficking experienced by Colombia in the latter half of the twentieth century. Examining the junction of innocence and immorality, this genre has sought to relate various experiences of the young sicario, an emblematic figure of the modern violence and drug trafficking in Colombia. This paper will analyze and discuss three prominent novels within this extensive corpus of work: Fernando Vallejo's *La Virgen de los sicarios*, Oscar Collazos' *Morir con pap*, and Arturo Alape's *Sangre ajena*. Through discussing the thematic, linguistic and symbolic significance of the character of the sicario presented in each novel, the variety and range of this genre,

in terms of its social and cultural nuances, will be revealed. This study will largely focus on the role of the narrative and perspective, considering the prevalence of the testimonial within this genre that has attracted considerable attention from contemporary critics. Ultimately, this paper will attempt to analyze this fragile construction of the sicarios, their impending fate, and how this social microcosm has been represented in literature.

## INFUSED PHOTONIC CRYSTAL FIBERS FOR PROTEIN ANALYSIS

JENNA KNOWLES

FACULTY ADVISOR: ERIC PAGE, PH.D.

DEPARTMENT OF PHYSICS

Photonic crystal fibers are optical fibers with numerous, often symmetrical air holes running the length of the fiber. Selectively filling the holes of the photonic crystal fiber with liquid solutions has been used to study the optical properties of the infused fiber, including optical bandgap propagation. In this study, we filled the air holes of photonic crystal fibers with protein solutions and investigated the optical properties of light propagated through the fiber. Specifically, we looked at the spatial distribution of the light at the end of the photonic crystal fiber as well as the absorption spectrum of the protein solution in the fiber. We concentrated on one particular protein, and repeated the measurements for different protein concentrations in its natural state, as well as different conformational states produced by the addition of measured concentrations of urea to selectively denature the protein.

## CREATIVE MIND, TRAVELING SEEKER, MINDFUL WRITER: AN EXPEDITION IN CREATIVE WRITING

JEN LAGEDROST

FACULTY ADVISOR: IRENE WILLIAMS, PH.D.

DEPARTMENT OF ENGLISH

I am constructing an original creative writing project inspired by and in response to my experience traveling in India. I am working to express a theme of travel as an opportunity to face a relationship with oneself, and I am doing so through writing poetry, prose, dramatic monologue, and scenes/ sketches that will culminate into a creatively constructed reflection and presentation of a traveling experience. Preparation for my project includes the study of modern writers and theories of writing, as well as the compiled application of my study of literature and writing as an English major. I am building upon and utilizing literary skills from courses in Playwriting, Modern Literature, Writing Autobiography, and Poetry. My personal aim for this project is to prepare myself for prospective creative writing projects in my future as a writer, endeavors that will require my knowledge of and experience with this kind of independent project. This will most likely become part of a series of writings in which I create responses to and interpretations of my experiences as a traveling seeker.

## PSYCHOLOGICAL SCHOLARSHIP OF ETHNIC IDENTITY: INCORPORATING AND EMBRACING ETHNIC STUDIES PROGRAM PERSPECTIVES INTO THE EXISTING LITERATURE

MELISSA LAMOUREUX

FACULTY ADVISOR: GAIL PEREZ, PH.D.

ETHNIC STUDIES PROGRAM

Psychological theory and clinical perspectives do not interpret and understand the idea of identity and ethnicity from a holistic perspective. Such frameworks view identity formation simply as a personal and internal process, and ignore the impact of socio-cultural and political historical forces that shape personal identity. This type of orientation influences therapists in their clinical setting, and thus creates an incomplete approach to address ethnic identity formation. The focus of this essay is to argue that Ethnic Studies Program scholarship can enrich the current scholarly discourse regarding identity formation because it utilizes a historical context. My paper intends to supplement psychological theory with Ethnic Studies Program perspective to create a stronger foundation for the study and understanding of ethnic identity formation.

## WIND TUNNEL SENIOR DESIGN PROJECT

SEAN LEAKE, BRUCE BROWN, CHRIS NEITHARDT AND CHRIS WILSON

FACULTY ADVISOR: FRANK JACOBITZ, PH.D.

DEPARTMENT OF MECHANICAL ENGINEERING

The University of San Diego's Department of Mechanical Engineering is currently experiencing rapid growth. Due to the increase in its student population, additional laboratory experiments are required to fulfill the needs of the department. Presently, there is no laboratory apparatus to aid in testing and visualizing fluid flow over an object. Because this topic is covered thoroughly in Thermal Sciences and Fluid Mechanics, there is a need for laboratory equipment to demonstrate the intricacies of the subject first hand. The goal of the Wind Tunnel Senior Design Project is to solve the department's needs by researching, developing, and constructing a laboratory grade, bench-top wind tunnel that can be used as an experiment station. During the Fall Semester of 2007, three senior mechanical engineering students and one senior electrical engineering student collaborated efforts researching the effects of flow visualization for a better understanding of fluid motion, as well as designing the wind tunnel and its computer based interface. The Spring Semester of 2008 has been spent constructing the wind tunnel and testing its research-based design.

## NEEDS ASSESSMENT PROJECT REGARDING HEALTH CARE, EDUCATION, HOUSING AND SOCIAL JUSTICE ISSUES FACED BY LATINO IMMIGRANTS IN SAN DIEGO

CLAUDIA LLAMAS AND DARLA GRANGER

FACULTY ADVISOR: GAIL PEREZ, PH.D.

ETHNIC STUDIES PROGRAM

What are the needs and interests of recent immigrants in the United States? The purpose of this study is to administer a "needs assessment" of a local Latino/Mexican community who comprise part of a parish in San Diego County. Our project has identified immigrants with a rich and valuable narrative regarding their needs and desires as they interact with U.S. society. It is of immigrant's highest interest to coalesce as a knowledgeable community in regards to health care, education, housing and social justice information. Our objective is to report the findings of our four phase study that includes the following: 1) Meeting and shaping our objectives with the immigrant community; 2) Interviewing them in order to discover their needs and desires; 3) Put together a needs assessment for this specific population; and 4) Use this information to help these communities solve their issues by connecting them with service providers and critical information re: health care, education, housing and issues of social justice. In addition, our study will also explore the methodological implications for studying and understanding this Latino/a immigrant community.

## WOMEN OF IMPACT IN THE COMMUNITY

ANGELA LOPEZ, MALLORY CHRISTIANSON AND VALERIE BRATTON

FACULTY ADVISOR: ALBERTO PULIDO, PH.D.

ETHNIC STUDIES PROGRAM

We will be working with students from San Diego High School assisting them on learning about female civil rights leaders and creating a mural that will be up for display. The project goes beyond teaching students about history; it involves learning how to interact with students from different backgrounds than ours. USD students and the San Diego High students will be working together as a group to present to the community the result of their collective effort, a mural.

## TEXT MESSAGE TO TV

SHAWN LYONS, MICHAEL NIEMAN AND ANDREW GERRY

FACULTY ADVISOR: KATHLEEN KRAMER, PH.D.  
ELECTRICAL ENGINEERING PROGRAM

The text message to TV device is a short message controlled infrared transmitter. Imagine you are on your way out of town to visit your friend and you realize that you forgot to set your DVR to record the big football game. If you had remembered to set your DVR before you left, you would be able to watch the game upon your return home. Instead, you are going to miss the big game and will not be able to watch the recorded version later. However, the Text Message to Television (TMTV) device will eliminate this problem. As you remember that you forgot to record the game in the middle of your road trip, your problem will be solved at the ease of a text message. The text message to TV device will be designed to do the rest. It will receive the text message, interpret the message, and output an infrared signal to the DVR. Now a consumer will never miss the big game again. The product consists of a small metal casing designed to compliment any entertainment system. A consumer will simply have to setup the TMTV by downloading the proper code that corresponds to their DVR system and power the device using a typical wall outlet. The appliance fits in with any living room and is aesthetically comfortable. The TMTV provides a unique and useful function for any person or household anywhere.

## BUILDING A CIVIL SOCIETY AMONG YOUTH IN POST-CONFLICT AFRICA

SAMANTHA MABRY

FACULTY ADVISOR: MIKE WILLIAMS, PH.D.  
DEPARTMENT OF POLITICAL SCIENCE AND INTERNATIONAL RELATIONS

The lives of children of war are risked every day due to their involvement in conflict areas, but it is the time during post-war reconstruction when these children suffer the most. It is at this time when children are most vulnerable that assisting and encouraging them to re-enter civil society is extremely important for the future of the country. However, reintegration programs for children are usually the first programs cut due to lack of finances. This research will include an in-depth study of programs in post-decolonialization Kenya, post-apartheid South Africa, and the reintegration programs of child soldiers in Sierra Leone after the civil war in 1993. By examining the programs, this project will bring together the best practices and form a universal reintegration program that can be used in future post-conflict areas.

## A COLLEGE GUIDE TO EMPOWER PARENTS

TANYA MANZO

FACULTY ADVISOR: ALBERTO PULIDO, PH.D.  
ETHNIC STUDIES PROGRAM

In an attempt to increase parent awareness of the college admission process for the University of San Diego, I have developed a handbook in conjunction with Upward Bound and the Ethnic Studies Program. This handbook is specifically designed for parents of first generation college bound students who want to become more involved in their son/daughter's education. My project is aimed at helping these parents understand admission requirements as well as providing year to year information on classes and activities that their son/daughter should be a part of in order to become strong candidates. Therefore, I developed an applied research method where a final product will be designed and utilized by parents. My poster will represent the final product (handbook) that I am designing for parents in order to help increase the numbers of first generation college students.

## STABLE ISOTOPE ANALYSIS OF $^{13}\text{C}/^{12}\text{C}$ AND $^{15}\text{N}/^{14}\text{N}$ TO DETERMINE RELATIVE TROPHIC POSITION OF ALBACORE TUNA IN THE SOUTHERN CALIFORNIA BIGHT AND NORTH PACIFIC GYRE

ANDREA MCBETH

FACULTY INTERNSHIP ADVISOR: RON KAUFMANN, PH.D.  
DEPARTMENT OF MARINE SCIENCE AND ENVIRONMENTAL STUDIES

Albacore tuna specimens were collected off the Pacific Coast near San Diego, Calif. and Newport, Ore. The liver tissue from the specimens will be used in stable isotope analysis. The chemical shift data obtained from this analysis will be then used to calculate the relative trophic position of the tuna. Information that is obtained about the dietary habits of albacore tuna can be used to contribute to policy in maintaining sustainable fisheries. The prepared tissue of approximately 50 tuna livers and 10 prey items will be analyzed at the UC Davis Isotope Laboratories using an isotope ratio mass spectrometer. The variations in trophic values of the tuna within the two locations will be compared to diet content data that is being collected from the same tuna specimen at Scripps Institute of Oceanography. This analysis represents a pilot study that will be followed up by a larger sample analysis in the future.

## PRIVATE EQUITY AND ITS IMPACT ON GROWTH IN EMERGING MARKET ECONOMIES

BRAD MCCARTER

FACULTY ADVISOR: STEVEN SUMNER, PH.D.  
DEPARTMENT OF ECONOMICS

In the year 2007, private equity funds in the United States raised more than \$302 billion, up more than 19 percent from the previous year, across 415 different funds. Over the past decade, the dynamic rise of private equity in global capital markets has run parallel to significant economic growth in multiple emerging markets, such as China and India. Using cross-sectional and time series data to examine factors of economic growth between these two economies over the past decade, this project will determine and investigate the correlation between these two trends using multiple regression techniques, and analyze the structural characteristics of private equity which encourage growth in emerging market economies.

## EDUCATION: THE SOLUTION TO ALL PROBLEMS

JACLYN MCCOSTLIN, ASHLEN NIMMO, JENNIFER GABEIN, JENNIFER FENNESSY, STEVE HILBERT, MICHAEL LUGO AND CASEY DYSON

FACULTY ADVISOR: ALBERTO PULIDO, PH.D.  
ETHNIC STUDIES PROGRAM

For our project our poster demonstrates our work with the San Diego Organizing Project (SDOP), whose goal is to unite people throughout a community in various ways. The SDOP is a faith-based organization and they address issues such as housing, health care, and safety. Our main focus on this journey of research is education. Our objective is to strive to get a better understanding of what specifically SDOP does in efforts to help promote equal opportunity in education within our community, as well as personally interacting with various projects their organization becomes a part of. We hope, by making this poster, to increase the public awareness about the importance of education in relation to social justice and what SDOP does to help these causes throughout the San Diego community.

## DNA VACCINES: AN INVESTIGATION OF METHODS THAT IMPROVE THE IMMUNE RESPONSE

JESSICA MCEWEN

FACULTY ADVISOR: TONYA HUFF, PH.D.  
DEPARTMENT OF BIOLOGY

DNA vaccines offer many advantages over traditional vaccines. For example, they can elicit both humoral and cell-mediated immunity. While DNA vaccines have shown promising results in small clinical models, there has been little success when moved to larger organisms. So far, only two DNA vaccines have been licensed for use: a West Nile vaccine for horses and an infectious hematopoietic necrosis virus vaccine for salmon. This project aims to investigate why these two DNA vaccines were successful and compare them to other DNA vaccine attempts that fell short. Many things may help improve the efficacy of DNA vaccines: dosage, route of administration and addition of an adjuvant have been shown to affect the strength of the immune response produced. Target selection may also play a very important role. A careful investigation of all these considerations will provide a direction for future research.

## OUR WATCH HAS BROKEN: THE RESPONSE OF THE INTERNATIONAL COMMUNITY TO HUMANITY

WILLIAM MCGEE

FACULTY ADVISOR: MIKE WILLIAMS, PH.D.  
DEPARTMENT OF POLITICAL SCIENCE AND INTERNATIONAL RELATIONS

In researching the current situation in the Darfur region of Sudan I have found that despite a large outpouring of foreign assistance from the Western World, the conflict continues to cause the destruction of local society and human life in this area. This reality points to a number of major issues with current systems of foreign and humanitarian aid. After looking at systems of aid and the ways in which foreign powers distribute aid, this project will present the current situation in Darfur and use it to critique these systems of foreign aid. The end goal of the project will be to make some suggestions about how best countries can improve their approach to foreign aid in a way that increases its effectiveness and ability to bring peace to conflict areas around the world. My initial conclusion is that monetary aid must be provided alongside more comprehensive actions.

## PERU AND COLOMBIA: A COMPARATIVE STRATEGY AGAINST NARCO-TERRORISM

CARLA MEYERS

FACULTY ADVISOR: RANDY WILLOUGHBY, PH.D.

DEPARTMENT OF POLITICAL SCIENCE AND INTERNATIONAL RELATIONS

The threat of terrorism is one of the most pressing international security issues of the past and modern day. A subdivision is that of narco-terrorism, which combines the illegal activities and motivations of drug trafficking and terrorist groups. This project addresses the problem of narco-terrorism in context to the countries of Peru and Colombia. In light of their present situations, Peru has been more successful in repressing the narco-terrorist threat and enacting government control. The thesis claims that Peru's success is due to its establishment of a strong state under the authoritarian policies of former President Alberto Fujimori, in comparison to the failed policies of "democratic" Colombia. The coinciding methods are an evaluation of counter strategies and statistical analysis of narco-terrorist activity. The findings of this research can be applied to the study of narco-terrorism as a threat to global security and future policy considerations.

## SEDIMENTATION RATES IN DEVELOPED AND UNDEVELOPED WATERSHEDS OF ST. JOHN, U.S.VIRGIN ISLANDS

KARA MILLER

FACULTY ADVISOR: SARAH GRAY, PH.D.

DEPARTMENT OF MARINE SCIENCE AND ENVIRONMENTAL STUDIES

From Aug. 2-30, I worked with Professor Sarah Gray and a team of three other students studying sedimentation rates in St. John, United States Virgin Islands. About 50 percent of St. John is a protected National Park, so two of our test locations were in the park area and two were outside in developed watersheds. In a pilot study we constructed sediment traps and placed them in four different bays. We also collected bottom sediment samples and took videos along multiple transects in the four bays. Total sediment flux data at the greatest amount, although not normalized to a watershed, showed rates over twenty times as large in Fish Bay, which was outside the national park area and contained several construction sites nearby. Overall sedimentation rates seemed to increase with storm events. This was the beginning of a long-term project to monitor sedimentation rates in the various bays and reefs around St. John, and thus provide useful information to watershed policy and regulation on the island.

## COFACTOR ORIENTATION AFFECTS REACTIVITY OF TPQ IN COPPER AMINE OXIDASE FROM HANSENULA POLYMORPHA

LAURA MURPHY

FACULTY ADVISOR: STEPHEN MILLS, PH.D.

DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY

Copper Amine Oxidase (CuAO) is an enzyme found in bacteria, plants, and animals that is structurally conserved but whose function seems variable. Our research is on the biogenesis of its TPQ cofactor because only 0.5 - 0.75 TPQ/CuAO monomer is detected when reacted with phenylhydrazine (PHZ). Our hypothesis is that the cofactor is fully formed but trapped in an unfavorable orientation. Denaturing our protein and comparing the amount of native protein that reacts with PHZ to how much denatured protein reacts with PHZ will be used to test this. An increase in reaction after denaturation would indicate that TPQ was present but in an unreactive conformation. Our protein is obtained as a His-tagged construct from a yeast expression system. Circular dichroism spectroscopy will be used to determine parameters for denaturing the protein.

## ITALIAN SUCCESS IN THE FIGHT AGAINST ORGANIZED CRIME: A MODEL FOR MEXICO

SHANNON MURPHY

FACULTY ADVISOR: RANDY WILLOUGHBY, PH.D.

DEPARTMENT OF POLITICAL SCIENCE AND INTERNATIONAL RELATIONS

This thesis seeks to substantiate the grounds on which Italy is comparable to Mexico, in the hopes of offering the Italian model of fighting organized crime as an effective strategy in Mexico's attempt at dealing with the drug cartels within its borders. It will be argued that the Italian war on the mafia in the late 1980s and early 1990s was successful because of a reorganization of law enforcement, improved evidence gathering and investigative techniques, and both judicial and electoral reforms. The purpose and meaningfulness behind this study is evidenced by the lack of literature relating "tried and true" organized crime strategies, and the urgency is evidenced in the tightening grip of drug cartels on the Mexican government that shows no real sign of subsiding in the near future. Crime statistics, including homicide rates, corruption perception, rate of crime reporting and politically motivated violence will serve as the quantitative points of comparison and thereby grounds of substantiating the application of the "Italian package" to Mexico.

## FOREIGN DIRECT INVESTMENT IN ARGENTINA

BRETT MURRAY

FACULTY ADVISOR: JOAN ANDERSON, PH.D.  
DEPARTMENT OF ECONOMICS AND PUBLIC POLICY

The country of Argentina has experienced substantial economic volatility within the last two decades on its journey to join the ranks of developed nations. More recently, Argentina has reestablished stability through reformed economic policy, and continues its transition towards development. This development effort is largely being driven by multinational corporations (MNCs) in the form of foreign direct investment (FDI). These MNCs are vested in profitable Argentine sectors, ranging from manufacturing and services to natural resource extraction and commodity and agricultural exports. While it is tempting to assume that the involvement of multinationals is a guaranteed path towards higher employment, increased competition and productivity, technology transfer, and other developmental gains, this assumption is not always warranted. The effectiveness of MNCs varies from sector to sector, and within industries. Thus it is necessary to examine the activities of MNCs within key industries, and to gauge their individual contributions towards economic development as measured by empirical and qualitative evidence.

## THE MAKING OF A MAGAZINE: MELANGE: FOOD, FASHION, AND ENTERTAINMENT

MALLORY NACHTSHEIM

FACULTY ADVISOR: ROGER PACE, PH.D.  
DEPARTMENT OF COMMUNICATION STUDIES

My primary objective in developing this project as my honors senior thesis is to learn about magazine writing, editing and publishing. By producing my own magazine, however, I will also be able to present potential employers with clear evidence of my passion for journalism. My finished product will be a polished work featuring articles, images, and reviews concerning everything from food and fashion, to art and entertainment. I have chosen to title my magazine Melange, due to the fun and interesting range of topics it will include. In creating Melange, I will use techniques, drawing from fields such as media writing, interviewing and negotiating that I have gained over the course of my training in the discipline of communication studies. I will also apply the skills I have developed as Editor in Chief of The Vista newspaper. Ultimately, I hope to become the editor of a major publication. Designing and producing Melange will help me to acquire such a position.

## THE EFFECTS OF DEMOGRAPHIC DISRUPTIONS ON THE CHINESE ECONOMY

JAMES NELSON

FACULTY ADVISOR: STEPHEN CONROY, PH.D.  
DEPARTMENT OF ECONOMICS AND PUBLIC POLICY

This project addresses the ways in which damaging demographic policies in China have disturbed the natural progression of its economy, and makes projections as to China's future movements. This is significant because the balance of world power in the near future is going shift, and an understanding of how and why this will happen is important to averting international conflict. My project will work in three stages. These will be to explore demographic labor shifts in China through recent history; to use these shifts to gauge China's current economic position based upon W. W. Rostow's theory of economic stage production; and to make predictions as to when China's economy will evolve to its next stage. To date, I believe China is currently positioned in the "takeoff phase" and will progress to the "drive to technological maturity" within as soon as five years. This will create significant tension with the United States as its economy begins to be eclipsed. Future research could delve into peace through trade theory, by which future conflict could intentionally be averted by establishing an economic interdependence between China and the United States.

## POLITICS IN IRAN

GISSELL K NUNO MALFITANO

FACULTY ADVISOR: ALI GHEISARRI, PH.D.  
DEPARTMENT OF POLITICAL SCIENCE AND INTERNATIONAL RELATIONS

By defining Iranian theocracy and outlining the country's political structure this analysis proposes to achieve a better understanding of Iran's domestic political landscape. Through a critique of what Edward Said defined as an Orientalist perspective, this paper will present an insider's look at different political forces and constituencies, which have come to influence Iran's foreign policy, international interactions, and political institutions. In addition, the paper will also explore an appropriate methodology for a deeper understanding of the nuances of political culture. It will be further argued that the American position that shies away from engagement fails to provide a more balanced view of Iran's domestic and foreign policies and potentials. Iranian politics is not monolithic but is a multilayered system. Also due attention to cultural, religious, and political factors will be presented in this creative collaborations project.

## CORPORATE ACCOUNTING SCANDALS: THEIR IMPACT ON THE ACCOUNTING PROFESSION AND THE SUBSEQUENT SHIFT TOWARDS AN ETHICS BASED CURRICULUM IN BUSINESS SCHOOLS

DEVIN O'NEILL

FACULTY ADVISOR: JAN MORRIS, PH.D.  
ACCOUNTING PROGRAM

The aim of my thesis research is to discover if there is a correlation among the corporate accounting scandals of the early 2000 era, their subsequent impact on the industry, and the emphasis of an ethics based curriculum in business schools. The corporate accounting scandals, such as Enron, WorldCom, Adelphia, Sunbeam, Arthur Andersen, etc, drastically changed the methodology of the accounting industry, as well as the demand for ethically centered accountants. Vast amounts of new legislature passed through the Sarbanes-Oxley Act of 2002, or SOX for short, named for the drafters of the act, Paul Sarbanes and Michael G. Oxley, greatly heightened the responsibilities and liabilities of accountants and corporations in general. The act only applies to publicly traded companies and outlines provisions, which must be followed in regards to internal controls, business practices, and auditing procedures. Through my research, I will look at what exactly these corporations and accounting firms did to commit fraud and if the choice to commit fraud was connected to their education in business school. I will also look at possible connections between the passing of SOX and a shift towards an ethics based curriculum in business schools.

## BIOINDICATORS OF CHEMICAL STRESSES IN CLAM TISSUES FROM MAGDALENA BAY

ASHLEY PARKS

FACULTY ADVISOR: JAMES BOLENDER, PH.D.  
DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY

Various organic and heavy metal pollutants are known to cause differential expression of certain proteins in impacted organisms. In Puerto San Carlos, Baja California Sur, Mexico there is a fish cannery polluting Magdalena Bay with organic waste and potentially heavy metal waste. The common white clam (*Chione californiensis*) has been collected from six sites (three reference, three impacted) in July and October 2007, and February 2008. Samples were analyzed for metallothionein-like proteins, glutathione S-transferase, and cytochrome c activity. The analysis of these three biomarkers referenced to total protein concentration can be compared between the sites around Magdalena Bay, and are potentially indicative of anthropogenic impact. The preliminary data indicate site differences and seasonal differences in the expression of these biomarkers. An additional data set will be collected in spring 2008 for a full seasonal analysis.

## SOLUTION STRUCTURE OF A DNA DUPLEX CONTAINING A GUANINE-DIFLUOROTOLUENE PAIR: A WOBBLE PAIR WITHOUT HYDROGEN BONDING?

DANIELLE PFAFF, KRISTINE M. CLARKE, TIMOTHY A. PARR AND JOANNA M. COLE

FACULTY ADVISORS: TAMMY DWYER, PH.D., AND DEBBIE TAHMASSEBI, PH.D.  
DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY

The structures of two short DNA duplexes have been computed using  $^1\text{H}$ ,  $^{19}\text{F}$  NMR and molecular dynamics calculations. One sequence contains a central G-T "wobble" base pair (CGAAGCTTCC:GGAAGTTTCG) and the other incorporates the non-hydrogen bonding thymine mimic difluorotoluene, (F) across from guanine to form a G-F pair (CGAAGCTTCC:GGAAGFTTCG) in the same position. The incorporation of synthetic nucleoside analogs into DNA duplexes provides a unique opportunity to probe both structure and function of nucleic acids. The identical nature of the duplexes (except for the single substitution) allowed us to evaluate the structural similarities and differences upon loss of hydrogen bonding in a wobble base pair. We use these results to posit a rationale for recognition and repair of mismatch sites in DNA.

## SYNTHESIS OF A FLUORESCENT DIDEOXY TERMINATED NUCLEOSIDE FOR THE STUDY OF DNA POLYMERASE

WILLIAM PORTERFIELD

FACULTY ADVISOR: DEBBIE TAHMASSEBI, PH.D.  
DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY

The general way that DNA Polymerase works is understood, but the detailed movements, conformational changes and the associated rates are still subjects of debate. Currently we are working on synthesizing a highly fluorescent novel dideoxy terminated nucleoside (ddtC) that preferentially base pairs opposite G in duplex DNA. By linking a fluorescence quencher to different positions of DNA Polymerase, we will be able to measure the distance dependent quenching of bound ddtC containing duplex DNA during the binding and incorporation of nucleotides. The dideoxy terminating of the nucleoside allows us to get it close to the regions of DNA Polymerase that move during these processes. The results of this research will provide a greater understanding of all DNA polymerases. Progress towards the synthesis of ddtC and its use as a fluorophore in duplex DNA will be presented and discussed.

## EVALUATION OF RAPE AS A FUNCTION OF THE EVALUATOR AND VICTIM'S SEXUAL ORIENTATION

MINDY PRESSMAN

FACULTY ADVISOR: JENNIFER ZWOLINSKI, PH.D.  
DEPARTMENT OF PSYCHOLOGY

Research has shown that innocent victims, including rape victims, are often blamed for their suffering (Furnham, 2003). People tend to rate rape victims who could potentially be attracted to a male perpetrator (i.e., gay men and heterosexual women) more harshly than victims whose sexual orientation would not indicate this attraction (i.e., heterosexual men and lesbian women; Wakelin and Long, 2003). The goal of the current study was to examine how participants' as well as the victim's sexual orientation would influence participants' evaluation of the victim. Fifty-eight men (47 heterosexual, 11 gay) and 72 women (48 heterosexual, 24 lesbian) ranging in age from 18 to 60 ( $M = 24.33$ ,  $SD = 7.72$ ) read a rape vignette, evaluating either a lesbian or heterosexual victim on character and behavioral blame for the rape. Results from a MANOVA suggested that gay and lesbian evaluators attribute more blame to a lesbian victim than heterosexual evaluators do [ $F(1, 69) = 5.75$ ,  $p = .019$ ]. Suggestions for future research will be discussed.

## REDEFINING ART THROUGH THE WORK OF ROBERT IRWIN

SHANNON REID

FACULTY ADVISOR: SALLY YARD, PH.D.  
DEPARTMENT OF FINE ARTS

My research sets out to explore the way art has developed in the 20th century by analyzing the evolution of Robert Irwin as an artist. Art has developed so rapidly during the last century that it may seem that there is a disconnect between contemporary art and traditional forms of the past. The question of what defines art is an issue every artist must face and is a constant concern for those in the art world. By looking at Robert Irwin's work, including his writings and public speeches, as well as analysis by art historians I find that Robert Irwin not only follows closely in the grand tradition of art but helps to propel art into the 21st century by continuing to ask questions that explore where the art begins and where the art ends.

## BROKEN RIBS AND LOTUS FEET: FEMALE DISFIGUREMENT AS CULTURAL PRACTICE

ELISE RICARD

FACULTY ADVISOR: YI SUN, PH.D.  
DEPARTMENT OF HISTORY

Countless generations of women are all too familiar with some variation of the saying "beauty is suffering." Two particular methods that capture the modern imagination are English corsetry and Chinese foot binding. Many histories have marked these practices solely as barbaric oppression by patriarchal societies. Through library research and interviews, this project explores the disfigurements as something beyond this commonly accepted notion: that the continuations of these traditions had something to do with perpetuation by women themselves, though within the context of social pressure. Particularly addressed are the differentiating social and historic contexts of China and England and how these factors influenced their continuation and perception within the respective cultures. Whereas English corsetry crossed international and even gender lines, Chinese foot binding became in a way a rite of womanhood that later became a symbol of traditional Chinese culture and a focus of international consequence under Imperialism.

## A VISUAL SEARCH FOR TRUTH: THE COMPARATIVE EFFECTS OF LIGHT, SPACE AND PERSPECTIVE IN THE ART OF EDOUARD MANET AND ROBERT IRWIN

TRICIA ROBSON

FACULTY ADVISOR: SALLY YARD, PH.D.  
DEPARTMENT OF ART HISTORY

The artwork of Edouard Manet and Robert Irwin initially seems widely divergent. In the backdrop of the political instability, social change and city modernization/renovation of 19th century France, Edouard Manet pushed the boundaries of traditional art through fiercely socially conscious themes and a shockingly flattened style that uprooted expectations in spatial rendering and perspective continuity. Robert Irwin, on the other hand, is a contemporary artist working and living in breezy Southern California, known for his progression from abstract expressionist paintings to site-generated installation art focusing on the experiential nature of perception. My research project examines the formal and philosophical similarities in the work of these seemingly contradictory artists. I seek to explore Manet and Irwin's joint embracement of modernist ideas in painting as a way to understand Irwin's art as an extension of the foundation set by Manet in the 19th century.

## PLANT GROWTH REGULATION AND MORPHOLOGICAL EFFECTS OF TIBERON

KAITLIN ROSICHAN AND DEVIN CRANE

FACULTY ADVISOR: LISA BAIRD, PH.D.  
DEPARTMENT OF BIOLOGY

In most plants, growing apical buds suppress the growth of lateral buds, a process termed apical dominance. Auxin is a plant hormone believed to contribute to apical dominance of plants. Contemporary postulates suggest auxin concentration gradients control apical dominance. Tiberon (cyclanilide) is a plant growth regulator known to inhibit auxin transport. Cyclanilide is used as a defoliant in cotton and studied for its ability to induce lateral branching in agriculturally important perennial plant species (Elfving et al, 2005). Recently, cyclanilide has been studied for its ability to induce lateral branching in ornamentals. Cyclanilide was used to examine the effects of inhibition of auxin transport on lateral branching. Basil, a herbaceous plant exhibiting strong apical dominance, was used to test the effectiveness of Tiberon in promoting lateral branching. Our data showed that Tiberon not only affected lateral branching, but also stimulated a number of other morphological responses, including changes in plant height and leaf morphology.

## PROLINE ACCUMULATION IN THE OSMOCONFORMING LARVA OF CULEX TARSALIS MOSQUITO

MATT RUTZ

FACULTY ADVISOR: MARJORIE PATRICK, PH.D.  
DEPARTMENT OF BIOLOGY

Mosquito larvae species *Culex tarsalis* is known to accumulate high concentrations of extracellular proline and trehalose when in a high salinity medium. What is unknown is what happens after proline and trehalose have been accumulated and the larvae are placed in a lower salinity medium. Initial findings suggest that ions are first to be regulated after the environmental dilution; however, the fates of proline and trehalose are still unknown.

## FUNDAMENTALIST, EVANGELICAL PROTESTANT STEREOTYPES OF AMERICAN ROMAN CATHOLICISM: THE CHICK TRACT PHENOMENON

ROBERT SCHEHR

FACULTY ADVISOR: EVELYN KIRKLEY, PH.D.  
DEPARTMENT OF THEOLOGY AND RELIGIOUS STUDIES

Since the Second Vatican Council, the Catholic Church has strove to engage in ecumenical dialogues with all Christians to promote mutual understanding among the denominations. Unfortunately, not all Christians agree with this, primarily the more independent, fundamentalist Protestant churches, such as the Southern Baptists, so misunderstandings and stereotypes still exist. Enter Jack Chick, a gifted, fundamentalist cartoonist, who for 40 years has used his artistic abilities to create evangelistic comic books. Some tracts are written against other major religions, particularly Catholicism, which from Chick's perspective are lovingly written to help these "deceived" believers see the "light" of Christianity. Chick is seen as extremely hostile towards and ignorant of other religious beliefs. I wish to briefly examine the person of Jack Chick, and what attracts his audience to his tracts. I intend to explore this notion of anti-Catholicism present in Chick's tracts by examining the stereotypes that he promotes.

## COMPUTATIONAL STUDY OF SELF-ASSEMBLY BETWEEN TRANSITION METAL-BENZENE CLUSTERS

CALVIN SCHNEIDER

FACULTY ADVISOR: JEREMY KUA, PH.D.  
DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY

Metals in the presence of benzenes have recently been found to exhibit self-assembly, in which two possible overall structures have been observed. Multiple-decker sandwiches appear exactly as the name would depict, with metals and benzenes alternately stacking on each other. "Rice-ball" structures have central metal clusters surrounded by benzene. The resulting structure from self-assembly for metal-benzene complexes has been found to be dependent on the identity of the transition metal present. Early transition metals have been found to prefer multiple-decker sandwich structure, while late transition metals have been found to form "rice-ball" structures in which different numbers of metal atoms can form the metal core. The reasons behind this trend are unknown and are what we hope to find through our research. We will present quantum mechanical calculations of metal-benzene interactions as an initial step towards parameterizing a reactive force field to observe the dynamic self-assembly of these clusters.

## METAL AFFINITY OF THE FERRIC UPTAKE REGULATOR

JOSEPH SCHNEIDER AND JULIE BECHERER

FACULTY ADVISOR: STEPHEN MILLS, PH.D.

DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY

Our research examines the ferric uptake regulator (Fur) protein, a transcription factor, in homologs from several different organisms, including *Pseudomonas aeruginosa* and *Lactobacillus plantarum*. Biologically useful iron is limited, and as a result, most living organisms have developed complex systems to regulate their intracellular iron concentration. Our study focuses on the ability of Fur to select and bind different metals, including Fe(II), Fe(III), Co(II), and Zn(II). Of particular importance in our inquiry is the geometry of the metal binding sites in the different homologs and their respective amino acid composition. We have transformed the fur gene into *E. coli* cells to produce sufficient quantities of protein, which were subsequently purified. Any metal present in the protein was removed with EDTA and replaced with the metals under study. The DNA affinity for Fur with different metals was assessed by gel shift assays. In the future, we plan to determine how tightly Fur binds these metals and what concentrations of these metals are required for Fur to bind DNA.

## ALCOHOL ADVERTISING AND YOUTH

KELLY SHANNON

FACULTY ADVISOR: LINDA BARKACS, PH.D.

SCHOOL OF BUSINESS ADMINISTRATION

My research project addresses the issue of alcohol advertising and youth. I will discuss alcohol advertising and American youth, commercial speech rights, and legal ramifications of alcohol advertising. This research is important to the field of business/advertising, as alcohol advertising has been constantly criticized for targeting youth. Criticism can harm/alter an advertising firm or industry's entire business plan. Likewise, alcohol advertisements can have a huge impact on a firm's social responsibility component. My research methodology will include compiling previous research showing the impact of alcohol advertising, as well as previous legal cases involving controversial alcohol advertisements. In terms of future research, I could research legal cases where the alcohol advertisements were controversial yet ended up being deemed appropriate. This could lead to a comparison between illegal and legal alcohol advertisements. I also think it would be interesting to tie in ethics and their impact on advertising.

## CINEMATIC HYPE: HOW A TRAILER CAN MAKE OR BREAK A MOVIE

HAYLEY SKOUSEN

FACULTY ADVISOR: ESTEBAN DEL RIO, PH.D.

DEPARTMENT OF COMMUNICATION STUDIES

Previews have the power to turn audiences on or off to seeing a movie. But they indicate more than that. I argue that an inverse relationship exists between the amount of plot details that a trailer reveals and the quality of the movie itself. In other words, the more a trailer gives away, the worse the movie is; and the less a trailer gives away, the better the movie is. By studying specific trailers and their corresponding movies, I aim to prove the viability of this rule of thumb. To accomplish this, I will watch trailers and categorize them as what I call spoiler trailers or teaser trailers. Spoiler trailers reveal too many plot details, while teaser trailers reveal very little. I will then watch the movie and look up critical reviews to determine if the movie was low or high in quality. I expect spoiler trailers to correspond with low quality movies and teaser trailers to correspond with high quality movies.

## PROPER MOTIONS AND KINEMATICS OF GIANT HH FLOWS IN CEPHEUS AND PERSEUS

KATRINA SMART AND DANIEL CHIRIBOGA

FACULTY ADVISOR: DAVID DEVINE, PH.D.

DEPARTMENT OF PHYSICS

Over two-dozen giant Herbig-Haro (HH) flows were discovered in deep, narrow-band images of star forming regions obtained by Dr. David Devine and his collaborators from 1993-1997. Radial velocities for several of these parsec-scale outflows were also obtained during that period; however, the kinematics of the majority of these flows remained uncertain due to the lack of information about their proper motions. We now present second epoch images for several of these outflows located in the Cepheus and Perseus star forming regions. The proper motions of the HH objects in these flows are used to infer the ejection history of the associated proto-stars over periods of order 1000 to 10,000 years, and the impact of these flows on the host cloud and the role of proto-stellar outflows in generating the large-scale turbulence observed in molecular clouds is quantified.

## CHARACTERIZATION OF THE REACTION PRODUCTS OF GLYOXAL AND GLYCINE AND THEIR RELATIONSHIP TO CLOUDS AND FOG

KYLE SMITH

FACULTY ADVISOR: DAVID DE HAAN, PH.D.  
DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY

This experiment will focus on the reaction products of glyoxal and the amino acid glycine. These two reactants are both present in clouds and fog. Their reaction is triggered by evaporation of water in the droplet, and produces non-volatile, deeply colored products that would be left behind as organic aerosol particles. The reactive sites on glyoxal are two carbonyl groups that act as an electrophile that can interact with a nucleophilic nitrogen on a glycine molecule. The products of this reaction will be characterized by <sup>1</sup>H-NMR, <sup>13</sup>C-NMR, <sup>15</sup>N-NMR, electron-spray mass spectrometry, and FTIR.

## BUSINESS PROPOSAL FOR AN OPTOMETRIC PRACTICE

MARIAH SMITH

FACULTY ADVISOR: HELDER SEBASTIAO, PH.D.  
MANAGEMENT PROGRAM OF THE SCHOOL OF BUSINESS ADMINISTRATION

The old wise saying goes, “look before you leap.” A business plan is a way for a person to examine and gauge the depth of their entrepreneurship on paper before throwing their money into a potentially disastrous project. It is a way to map out strategies and financing. The plan will let the writer know if their future business is viable. Many banks and other financiers require a business plan before making loans to prospective business developers. Utilizing books, personal interviews, another small business’ business proposal, and business plan software, a proposal was created. The sections of the plan touch on every aspect of the business, beginning with an executive summary with objectives and a mission statement. Following are start-up costs, a summary of the products and services offered, a market analysis, strategic elements, a summary of the management breakdown, and the financial projections. This project will result in a business plan that could be presented to private financiers, employees, and future partners. As with all business plans, the numbers are speculative. The plan would need to be updated and revised as the business operations progressed.

## THE EFFECT OF CONVERSATIONS ON COGNITIVE PROCESSES

CYNTHIA SMOOT, JULIE TRAN, AMANDA LEFEVRE, KRISTEN SEXTON  
AND SHAHRZAD SADRPOUR

FACULTY ADVISOR: VERONICA GALVAN, PH.D.  
DEPARTMENT OF PSYCHOLOGY

Cell phones are playing an increasingly large role in our lives as the number of owners increase, and more people rely on cell phones instead of land lines for communication. While studies have examined the impact of cell phone use on the user, there are almost no studies of the effect on bystanders. Our research examines the effects of cell phone conversation on bystanders’ cognitive processes. Participants were told the study’s purpose was to examine the relationship between solving anagrams and reading comprehension. During the “pre-testing” phase, participants solved anagrams while a nearby conversation ‘accidentally’ took place. The conversations were either one-sided (cell phone) or two-sided (normal) conversations. Afterwards, participants were given a surprise recognition test to determine what type of information the participant gathered from the conversation. It is expected that the one-sided conversation will prove more distracting. Future research will examine other cognitive processes and also physiological processes.

## “IT’S NOT PERSONAL, IT’S BUSINESS”: HOW CORPORATE SOCIAL RESPONSIBILITY IS MAKING BUSINESS PERSONAL

COLLEEN STEBBENS

FACULTY ADVISOR: PATRICIA MARQUEZ, PH.D.  
SCHOOL OF BUSINESS ADMINISTRATION

The research done in this project addresses a major issue in business ethics. It addresses the question of whether or not it pays to be a socially responsible company. This question is important to the subject of business because at this time companies are deciding how far they are willing to go and what they are willing to pay to develop their firms to be more ethically sound. This project looks at current research done on this subject by analyzing the financial profitability of various companies, as well as other ways in which the business could benefit. I am also researching how much the ethics of the business influences the consumer. This is significant because if it is proven that businesses that are more socially responsible are more profitable, then this will encourage more managers to be proactive about integrating corporate social responsibility into their companies.

## AN EXAMINATION OF INCLUSION AND DIVERSITY AT THE UNIVERSITY OF SAN DIEGO

CAROLYN STRAUB

FACULTY ADVISOR: GAIL PEREZ, PH.D.  
ETHNIC STUDIES PROGRAM/DEPARTMENT OF ENGLISH

Institutions of higher education are important catalysts of change in popular consciousness. Progressive ideas take root on university campuses and permeate the greater society. Many scholars agree that social diversity is directly related to high academic quality because having a diverse and inclusive university campus is imperative in order to attain excellence (Etchemendy, et. al: 2007; Dougherty, et. al: 2005). Thus, it is imperative that the university is free of racism, sexism, ageism, and the like. In this study I aim to assess issues of diversity, specifically at the University of San Diego (USD). USD is a fairly homogenous, Anglo, affluent, private Catholic university in Southern California. In this project I analyze marketing literature, conduct widespread interviews, and critique administrative policies in order to understand the causes/affects of USD's demographics. Moreover, I examine the institutional response to the student led rally, D Day, which was intended to increase the awareness of diversity and inclusion issues and change the campus atmosphere. This paper ultimately works to provide a framework for recommendations for institutional changes at USD.

## VISION AND REVISION: THE ESEMPLASTIC DESIRE OF SAMUEL TAYLOR COLERIDGE

PETER STRAWN

FACULTY ADVISOR: ABE STOLL, PH.D.  
DEPARTMENT OF ENGLISH

My project seeks to address the work of the Romantic poet Samuel Taylor Coleridge in light of his lifelong revision process. Because of his numerous revisions, issues arise regarding how to read his texts and even which version of a particular text to read. The complex layers within his works are not significantly addressed when looking at one version alone; therefore, comparing different versions of the same poem and underscoring the philosophical and theological influences that motivated certain textual changes provide a greater insight into Coleridge's poems and Coleridge himself. Moreover, Coleridge's own "esemplastic" desire to "shape into one" contextualizes his changes as evidences of a mind that strives to unify. The implications of this desire come to fruition very clearly in "The Eolian Harp," so an examination of this particular work will focus my project as I explore his poetic development and the implications of his many revisions.

## SYNTHESIS OF A NOVEL SERRATAMOLIDE ANALOGUE

BENJAMIN STREIFEL

FACULTY ADVISOR: STEVEN MORRISON, PH.D.  
DEPARTMENT OF BIOLOGY

Serratamolide is a member of a class of biologically active compounds called cyclic depsipeptides. These peptides have a distinctive 14-member core ring structure with alternating amide and ester bonds, and are produced as secondary metabolites of *Serratia* cultures. Patents held on serratamolide indicate its use as antifungal (1) and anticancer (2) drugs. Despite such significant uses, the drug is difficult to isolate from mutation-prone *Serratia* cultures and serratamolide itself inhibits phagocytosis and could potentially cause hemolysis. To avoid these problems, a novel serratamolide analogue has been designed and the synthesis planned. This analogue has removed the alkyl side chains that cause undesirable side effects and replaced them with phenyl groups, and it also originates from readily available starting compounds. The twelve-step synthesis includes many purifications and lengthy reactions, but once the synthesis is complete pathogenic fungal cultures and cancer cell lines can be tested for inhibition of growth.

1. Strobel, Morrison, and Cassella; U.S. Patent 6926892; 2005  
2. Thomas et al; U.S. Patent 20050239694; 2005

## A NEW METHOD FOR PURIFICATION AND QUANTIFICATION OF HOP BITTERING ACIDS

BENJAMIN STREIFEL

FACULTY ADVISOR: STEVEN MORRISON, PH.D.  
DEPARTMENT OF BIOLOGY

Bittering acids are a component of hops that can be broken down into two categories, alpha-acids and beta-acids (humulones and lupulones, respectively). Both are intensely bitter and commonly used flavoring agents and preservatives in beer, with isohumulones being more soluble and therefore the primary bittering agent in beer. Bittering acids are biologically active and known to be antibacterial (Johnson and Haas 2001), reduce insulin resistance, and lower blood pressure (Yajima et al. 2004). Quantification of these bittering acids is important to the beer brewing industry as part of a strict quality control/quality assurance program. A lack of readily available standards has increased the need for a selective and efficient extraction method. A method using 50:50 methanol:water was developed to extract only the hop alpha-acids. Using this extraction method, hop compounds were purified and a sample linear log-log scale was used to demonstrate an effective hop quantification method using HPLC-MS techniques.

## LIVING LITERATURE: THE INFLUENCE OF INTERNATIONAL LITERATURE VS. INTERNATIONAL IMMERSION ON ONE'S GLOBAL PERSPECTIVE

TANYA SUSOEV

FACULTY ADVISOR: ATREYEE PHUKAN, PH.D.

DEPARTMENT OF ENGLISH

The heart of this project lies in the development of an educational course curriculum that brings this examination to students at the high school level. This project researches how literature can affect our perspective of the international community, as well as, how this perspective is enhanced or changed by one's personal experience abroad. As an English major, this project allows students to examine literature in a way that can be directly applied to their world today. As a teaching credential candidate, this project familiarizes students with our international community while also encouraging students to connect classroom learning with real-world experience. In my research I examine a specific culture abroad by comparing travel guides with personal literature written from within the community. In addition, I ask for personal accounts from individuals who have had relevant international experience. For further study, I will implement this curriculum and examine student response.

## DETERMINANTS AND CONSEQUENCES OF POLITICAL STABILITY: THE CASE OF LEBANON

NATALIE TARABAY

FACULTY ADVISOR: J. MICHAEL WILLIAMS, PH.D.

DEPARTMENT OF POLITICAL SCIENCE AND INTERNATIONAL RELATIONS

State stability is an increasingly important concept in the study of International Relations, particularly considering the current state of global affairs. Given the effects of globalization, state stability or lack thereof can have extreme adverse effects on a state's surrounding neighbors as well as other players in the world system. In 2006, my family and I were caught in the war between Hezbollah and Israel while vacationing in Lebanon. This experience has prompted me to examine the determinants and consequences of state instability in Lebanon. Focusing specifically on the concept of political stability, this research examines the historical and current factors that have led to the current instability in Lebanon. Case studies of countries that have made a successful transition from instability to stability will be examined. The ultimate goal of this project is to assess the prospect of a stable Lebanese state and provide policy recommendations to repair the fractured political system.

## PRICE ELASTICITY OF PROFESSIONAL SPORTING TICKETS AS THEY APPROACH PERISHABILITY

MATTHEW THELEN

FACULTY ADVISOR: STEPHEN CONROY, PH.D.

SCHOOL OF BUSINESS ADMINISTRATION

My senior thesis will examine the price elasticity of ticket prices for a seat at a Los Angeles Lakers basketball game and how the prices of the tickets are affected by risk sharing. Though the advent of secondary markets has made this type of research increasingly valuable in the professional athletics industry, the information is also applicable to other industries in which perishable goods are involved. By examining the elasticity of ticket prices, managers are able to optimally price their good and maximize profit. I will follow the price of the tickets on Stubhub.com over a course of four periods to determine how price shifts, taking into account various dependent variables. This information will be relatively easy to gather, but the refinement of the regression to exclude colinearity and other econometric fallacies will require significant development.

## THE FORMING OF SELF-IDENTITY THROUGH SOCIAL NETWORKING SITES AT THE UNIVERSITY OF SAN DIEGO

AMANDA TRAVERSI

FACULTY ADVISOR: ESTEBAN DEL RIO, PH.D.

DEPARTMENT OF COMMUNICATION STUDIES

The purpose of this study is to discover why social networking sites may be so popular among undergraduate students at the University of San Diego. Previous research has suggested that social networking sites, although used in a variety of ways, tend to be an important outlet for self-expression. It is possible that today's youth, particularly college students, are no longer as open and expressive in public, but instead use social networking sites for self-expression and to build and define their relationships. Sites such as Facebook that have a social context act as networking sites that allow people to connect and stay in touch with others. Perhaps college students rely more on the social networking sites to create their identity because they provide invisible audiences, anonymity if desired, the ability to edit content, a place to connect, and a place for freedom of expression.

## MEASURING THE KINETICS OF REACTIONS BETWEEN GLYOXAL AND AMINO ACIDS

JACOB TURLEY

FACULTY ADVISOR: DAVID DEHAAN, PH.D.  
DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY

The study of glyoxal in the formation of smog in Southern California's atmosphere is a leading pursuit in understanding the existence of haze in our air and may lead to methods of prevention. As gasoline as well as other pollutants are oxidized in the air, products are formed in aerosol through self-reactions as well as reactions with amino acids. It is highly critical to determine how quickly these reactions occur. When measured at certain lab conditions, it will be possible to predict the reaction rates at various atmospheric conditions. To achieve this task, I will be determining the rate of the reaction between glyoxal and amino acids by analyzing concentrated solutions over a long period of time through Nuclear Magnetic Resonance spectroscopy.

## MAXIMIZING THE EFFECTIVENESS OF FOREIGN AID

ELISE VAUGHAN

FACULTY ADVISOR: J. MICHAEL WILLIAMS, PH.D.  
DEPARTMENT OF POLITICAL SCIENCE AND INTERNATIONAL RELATIONS

This research project examines how to maximize the effectiveness of foreign development aid. Though billions of dollars have been poured into developing countries, the overall effect of these efforts has failed to meet expectations. Therefore, there is a deficiency in the current foreign aid system. In pursuit of the goals of foreign aid, economic growth and increased quality of life, the mechanisms of foreign aid must be improved. Econometric analysis will demonstrate that the relationship between aid and growth is more complex than assumed by the classical dual-gap theory, and show that there are certain contextual factors which we should expect to influence the depth of the effect of aid on growth and quality of life. Based upon these results, it will be recommended that policymakers stop focusing on simply increasing the volume of aid, and instead develop contextually based strategies grounded with concepts of economic efficiency.

## PSYCHOSOCIAL EFFECTS OF VIOLENT VIDEO GAMES ON SELF-REPORT OF VERBAL AGGRESSION

CHASE WAGNER, IRENE RICO AND KATE LILLY

FACULTY ADVISOR: JENNIFER ZWOLINSKI, PH.D.  
DEPARTMENT OF PSYCHOLOGY

The current experiment examined whether playing violent video games increases self-report of trait verbal aggression, and how this is influenced by gender and prior violent video game exposure. Recruited from the Introduction to Psychology subject pool, 89 freshmen (59.6 percent female) were randomly assigned to play either a non-violent (Bejeweled 2) or violent (Quake 3) computer game for 15 minutes. Participants then completed the Video Game Rating Sheet to report prior (5-year) violent video game exposure, and the Aggression Questionnaire. A 2 (game) by 2 (gender) by 2 (prior violent video game exposure: high or low) ANCOVA was conducted for self-report of verbal aggression with game frustration as a covariate. Results indicated a three-way interaction,  $F(1, 87) = 4.25, p = .04$ , partial  $\eta^2 = .05$ . A follow-up ANCOVA showed that in the low exposure condition, males scored higher than females on verbal aggression,  $F(1, 16) = 5.99, p = .03$ , partial  $\eta^2 = .30$ . These results suggest that trait verbal aggression among males with low prior exposure to video game violence is increased with short-term exposure. Additional research is necessary to further examine the nature of this relationship.

## CONGRESSIONAL CAUCUS MEMBERSHIP AND ITS EFFECT ON COMMITTEE BEHAVIOR AMONGST HOUSE REPRESENTATIVES

MALLORY WATERS

FACULTY ADVISOR: CASEY DOMINGUEZ, PH.D.  
DEPARTMENT OF POLITICAL SCIENCE AND INTERNATIONAL RELATIONS

Committees have been the source of much debate and focus amongst political science scholars for several years and the understanding of committee activity is crucial to understanding the legislative process as a whole. Additionally, the study of groups both internal and external to the formal organization of Congress has been researched as they affect the Congressional legislative activities and agenda. However, the relationship of informal congressional groups to the committee process has not been given much attention in the discussion of committee power. In this paper, the question that drives the research is "What effect does membership in a constituency caucus such as the Congressional Caucus on Women's Issues have on a member's activity in committee?" Looking at this relationship gives insight into the degree to which a member's own goals influence their legislative activity. The focus will be relatively narrow, with research designed to examine how the individual caucus member acts in committee regarding issues that are key to the caucus.

## HOW EFFECTIVE ARE MOTION PICTURE SCORES ON EVOKING THEIR INTENDED EMOTION? AN EXAMINATION OF MUSIC AND SELF-REPORTED EMOTION

KIMBERLY WELCHONS

FACULTY ADVISOR: ANNE KOENIG, PH.D.

DEPARTMENT OF PSYCHOLOGY

My research through the SURE Program this spring inquired into the effectiveness of movie scores on evoking the intended emotion of a particular scene by mixing a scene with different music to see if emotional responses changed. The participants watched scenes with no music, listened to only a musical score, and watched scenes with a score from a different genre. I expect to show that scores do impact emotions and can actually dictate what a participant is feeling. One of the most intriguing responses is the amount of confusion and laughter that a score from a different genre can elicit. Future studies could determine if there is a particular aspect of music that evokes emotions, as well as if that aspect could help regulate emotional disorders such as depression. It may also lend itself to how image and movement affect emotion, and elucidate how emotions respond to different stimuli.

## BILLING SYSTEM IMPROVEMENT AT UCSD RADIATION ONCOLOGY DEPARTMENT

BRIGITTE WESSELINK, ASHLEE ENRIQUEZ

FACULTY ADVISOR: CLARIBEL BONILLA, PH.D.

PROGRAM IN INDUSTRIAL AND SYSTEMS ENGINEERING

In collaboration with USD, the Radiation Oncology Department at UCSD is undergoing systems improvement and quality assurance projects to enhance the patient experience. USD selected the billing function as the initial effort because the accuracy of these billings is important for proper reimbursement of the company as well as for lawful reasons. The staffs of the main radiation treatment machines were tasked with self-auditing the billing of the treatments on each machine. The process that each team used did not follow any set procedure, included unnecessary redundancy, and differed greatly though the machines were similar. Therefore, our task was to understand the current procedures of each team, document them with process maps, provide suggestions for improvements, and supply a set method for the staff to follow. By streamlining the tasks, eliminating redundant steps, and clearly defining the process, a reduction in the number of errors and process time is expected.

## THE ROLE OF HUMAN CAPITAL IN ENDING THE RESOURCE CURSE

NICHOLAS WINFREY

FACULTY ADVISOR: DAVID SHIRK, PH.D.

DEPARTMENT OF POLITICAL SCIENCE AND INTERNATIONAL RELATIONS

Contrary to classical economic theories, natural resources have been more of a curse than a blessing in recent times. In general, natural resource-rich countries have lagged behind resource-poor countries in all measurements of growth. Using cross-country and time-series data this study readdresses the resource curse by looking at past studies' shortcomings and how they can be improved upon. Through regression analysis and Granger causality this study shows an important linkage between natural resources and human capital. Contrary to earlier findings, human capital is a statistically significant variable in explaining the resource curse, especially when using a time-lagged approach. This study's findings should help change the approach of policymakers involved with the curse. Attention should be moved from macro level stabilization plans to micro level human development policies. Further research would build upon these findings, and try to determine the most effective way to increase human capital in resource-abundant countries.

## METAL COMPLEXES FORMED FROM FERROCENE-BASED DIPYRROMETHENE LIGANDS

RANDY YALE AND KRISTINA KHAZENI

FACULTY INTERNSHIP ADVISOR: MITCH MALACHOWSKI, PH.D.

DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY

Organic moieties called dipyrromethenes have become increasingly popular as donors to metal ions. We have synthesized a series of new organic molecules where we have combined the dipyrromethene portion to a ferrocene fragment. These organic molecules have been complexed to metal ions such as copper and cobalt and the metal complexes have been characterized. As the ferrocene already contains a metal ion (iron), we now have complexes that contain two different metal ions. We have begun to study the properties of these complexes by looking at the communication between the two metals by using UV-vis spectroscopy and electrochemistry. We will discuss these results and compare them to what is known about other ferrocene-containing complexes.

## THE DISPERSION RELATION IN PERIODIC LAYERED MEDIA

PAUL YANDELL

FACULTY ADVISOR: ANI VELO, PH.D.

DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE

This project looked at wave propagation through an infinite, periodic, layered medium in order to study the relationship between the wave number and the wave frequency, known as the dispersion relation. Once the dispersion relation is found, we are able to look at the band gaps, which identify the wave frequencies that are completely blocked as they travel through the medium. The medium consists of a single cell with  $n$  layers of material that is repeated infinitely many times in one dimension. Previous work, using Calculus of Variations, looked at a symmetric cell with three layers; this project expands that work to identify the dispersion relation for a general cell with  $n$  layers. This allowed us to write a computer program to calculate and display the dispersion relation, as well as locate the band gaps. This work has many potential applications, including earplugs that can block certain frequencies while still allowing others to be heard.

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PROFESSOR	DEPARTMENT
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