

Presenter: Alai, Hamid

Research Mentor: Dr. Denis English

Title: Sphingosine 1-Phosphate: Nature's Mediator of the Inflammatory Response?

The neutrophilic leukocyte, the effector cell of the inflammatory response, provides the first line of host defense against invading microorganisms. However, reactants released from stimulated neutrophils lead to devastating tissue damage. Neutrophils released these reactants after migration to sites of inflammation. However processes which regulate inflammatory mediator release haven't been identified. In ongoing studies, we find that neutrophil inflammatory mediator release is dramatically regulated by matrix signaling and by Sphingosine 1 – phosphate (S1P), a physiologically relevant stimuli released at sites of hemostasis, inflammation, infection and wound healing. S1P appears to inhibit neutrophil migration, yet little has been reported on its regulatory role in inflammation. Our studies show that S1P holds an essential role in inflammatory regulation and that this effect is matrix dependent. Our results show that matrix signaling is a key factor in S1P regulation of inflammation. We propose that the divergent and matrix-dependent regulation of neutrophil migration plays a pivotal role in homeostatic control of the inflammatory response, therefore implicating S1P as a potential therapeutic target.

Presenter: Alvarado, David

Research Mentor: Dr. Patricia Kruk

Title: The BRCA1 185delAG Mutation Increases Maspin Expression in Human Ovarian Surface Epithelial Cells

Mutations in the breast and ovarian cancer susceptibility gene, BRCA1, are present in 60% of hereditary ovarian cancers and 30-70% of all sporadic ovarian carcinomas. One such BRCA1 mutation is the amino-terminal BRCA1 185delAG (BRAt), a frame shift mutation that causes a premature stop codon at position 39 resulting in a severely truncated protein. Human ovarian surface epithelial (HOSE) cells expressing this mutation have been shown to exhibit increased caspase-mediated apoptosis following chemotherapeutic treatment. Interestingly, mammary serine protease inhibitor (maspin) expression has been shown to similarly increase caspase-mediated apoptosis in mammary carcinoma cells following chemotherapeutic treatment. Maspin was initially characterized based on its expression in normal breast epithelial cells but not in malignant breast cells. Maspin has tumor-suppressive capabilities and has been shown to inhibit tumor metastasis in mammary cells. The current study tests the hypothesis that the BRCA1 185delAG mutation increases maspin expression in HOSE. BRCA1 wild-type HOSE cells were transfected with BRAt cDNA and showed increased maspin mRNA levels and increased maspin protein levels as compared to mock-transfected cells. BRAt-transfected HOSE cells also showed a significant decrease in proliferation following chemotherapeutic treatment as compared to mock-transfected cells. A similar decrease in proliferation was observed in cells transfected with maspin cDNA. A better understanding of the interaction between BRCA1 185delAG and maspin could impact future chemotherapeutic techniques.

Presenter: Andersen, Kellan  
Research Mentor: Dr. Bill Brewer  
Title: *The Birthday Party*

The Scenic design of USF production of Harold Pinter's *The Birthday Party* is a perfect example of taking a somewhat dated script and using "outside the box" design methods to introduce a new exciting look at a classic piece. The design process I undertook was given total artistic freedom to allow me the space to symbolically communicate the intense ideals and visions of Harold Pinter's writing in a radical and surreal environment.

My design process started in late November of 2006 with concept meeting between director Mark Powers and I to communicate and establish a vision for *The Birthday Party*. In these meeting I presented to him pictorial research, hand drawn renderings and verbal explanations of the direction the scenic design should go.

Once the concept was agreed upon I built a half inch scale model of my scenic design that fully displayed a color pallet, spatial relation, and textural quality. Once the model was approved the building plans were drafted and the build for the production taken underway.

January 9<sup>th</sup> through the 15<sup>th</sup> was the time of the build process. I supervised all design aspects of the productions creation to insure the integrity of the final product. This included prop building, scenic painting, crew leadership, sculpting and build supervision.

The USF Theatre production of *The Birthday Party* opened in theater two Thursday February 15<sup>th</sup> 2007.

Presenter: Antoine, Steve

Second Authors: Ashley Cole<sup>1</sup>, Mrunal Shah<sup>1</sup>, Anthony Dicamillo<sup>1</sup>, James Kotick<sup>1</sup>, Alvin Terry<sup>2</sup>

Research Mentor: Dr. Ronald Mervis

Title: Neurotoxic Consequences of Chlorpyrifos Exposure on Dendritic Circuitry in the Adult Rat Brain

Chlorpyrifos (CPF) is a common organophosphate (OP) insecticide. It has extensive use in agriculture as a pesticide. The primary mechanism of action is inhibition of acetylcholinesterase (AChE). Exposure to OPs have deleterious neurobehavioral consequences. Analysis of Golgi stained neurons was chosen for morphological assay which allows for complete visualization of entire dendritic arbor and quantification of the morphometric changes. The CPF rats were given 18mg/kg for 14 days. Neurons were evaluated from the cingulate gyrus of the cortex and granule cells of the dentate gyrus. In the dentate gyrus, analysis of the dendritic arbor revealed a significant reduction of material across the entire tree in the chlorpyrifos exposed animal ( $p < 0.0001$ , Wilcoxin Test) corresponding to a ~16% decrease in dendritic material. Branch point analysis of these animals revealed a trend toward less complex dendritic arbors in the treatment group. Dendritic spine analysis showed a significant ~7% ( $p < 0.02$ , unpaired T) decrease in the treatment group. These results show that a 14 day exposure CPF causes a significant reduction in dendritic complexity, branching, and spine loss in the hippocampus, which may be the underlying neuroanatomical basis for cognitive dysfunction in OP-exposed subjects.

Presenter: Arthus, Jean-Michel

Research Mentor: Dr. Roberto Flores

Title: Development of a Viral Load Assay for the Quantitation Analysis of Human Papillomavirus Infection in Men

The association between Human papillomavirus (HPV) and invasive cancers of the vagina, vulva and anogenitals in women, and penile and anal cancers in men has been confirmed by several biological as well as epidemiological studies. HPV, a sexually transmitted infection, is deemed to be the main etiological agent for cervical cancer in women, and anal, and to some extent to penile cancer in men. However, little is known about the natural history of HPV infection in men, thought to serve as the reservoir for transmission of the viral infection to women.

In an effort to investigate the infection rate observed in women, we have focused on viral factors associated with the infectivity and transmissibility of HPV from men to women. One important factor may be the level of viral load in infected genital skin in men. The purpose of this study will focus on the development of a quantitative assay to determine viral load of HPV in exfoliated genital cells from men. This assay may also be used in future studies to monitor changes in viral DNA, observe the level of replication during the course of infection and hopefully make the association of high viral load in men to transmissibility.

Presenter: Avilas, Mabel

Second Authors: Andrea Schlunk, Asha George, Sandra Acosta, Stephen Ahern, Daniel Paredes

Research Mentor: Dr. Paula Bickford

Title: Learning Consolidation Process of the Cerebellar Eyeblink Conditioning Requires the Activation of Beta-Adrenergic Receptors for at Least 60 Minutes Post Training Session

The neurotransmitter norepinephrine (NE) has been shown to modulate cerebellar-dependent learning and memory. Delay classical conditioning is a paradigm that depends primarily on the cerebellum. Previous evidence from our lab has shown that blocking beta-noradrenergic receptors with propranolol prior to training sessions significantly impaired acquisition of the eye blink task in rats. This was observed with both intraperitoneal injections and infusion directly into the cerebellar interpositus and lobule HVI. In a recent microdialysis study, it was shown that there was a significant elevation in the extracellular levels of norepinephrine (NE) during the training sessions. This overflow of NE remained elevated for about 60 minutes after the first training session had finished; however, this long lasting pattern of NE release decreased over the days of training. Based upon these results, it was hypothesized that the NE overflow that outlasts the training session might be involved in the consolidation of the learned behavior.

To test this hypothesis, 1 uL of propranolol (100 uM) or vehicle (aCSF) was ipsilaterally infused into the cerebellar lobule HVI 5, 60 or 120 minutes after each training session.

The rats which received a local infusion of propranolol showed impaired learning compared to the control group (aCSF).

These data indicate that NE overflow, which remains elevated after the training session, may be playing an important role in the process of memory consolidation.

Presenter: Bauer, Jeremy

Research Mentor: Dr. Joseph Vandello

Title: The Effect of Negative Performance Feedback on Voluntary Work Behavior

The purpose of this study is to determine the effect that differing types of negative performance feedback have on the voluntary work behavior. The negative feedback will differ on perceived fairness and what the feedback focuses on (person vs. task). The outcome of this study may help guide supervisors into providing the right kind of negative feedback to their subordinates in order to promote positive voluntary behaviors and prevent counterproductive work behavior. It has been found that counterproductive work behavior can be detrimental to an organization.

This study will have approximately 80-120 participants. The participants will be given two tasks that consist of analogies. Negative performance feedback will be given verbally to the participant between the two tasks. The participants will then be given opportunity to display counterproductive work behavior (stealing pens, negative scoring on evaluations), or positive voluntary work behavior (completing extra-tasks, giving positive ratings to the experiment). It is expected that participants will commit more positive voluntary work behavior if the feedback is perceived fair and based on the task. Conversely, the participants are expected to display more counterproductive work behavior if the feedback is perceived as unfair and focused on the person. Organizations would benefit substantially if they could provide the right type of negative performance feedback to promote the appropriate type of voluntary work behavior.

Presenter: Bilov, Dmytro

Research Mentor: Dr. Sean Barbeau

Title: TAD Server: Travel Assistance Device Server

TAD is a real time tracking/guidance system being developed at Center for Urban Transportation Research at University of South Florida to help disabled people and their caretakers effectively use mass transportation systems using a GPS data gathered from cell phones running TAD software. The system works by combining a web interface for the caretaker, cell phone with TAD software for the disabled user and server side software to track and provide real time information about the location of a person.

Web Interface provides ability for caretaker to track multiple persons under his jurisdiction, add new users and remove other users as well as set specific routes for each user. The cell phone software provides notification to the user on when to get on and off the bus by is using data from the server. The server side software tracks the positions of the users by receiving data from the cell phone, sending alarms to the user's cell phone reminding them to get on or off the bus. The software also notify's the cell phone user and their guardian when the user comes too far from his given route. This paper explores server side of TAD system, backed by sample data and future outlook on developments. Some of the items that will be presented will deal with battery life issues, protocol description and test data.

Presenter: Boe, Jeff  
Research Mentor: Dr. Denis Calandra  
Title: Special Effects Design, Carl Hiassen's *Lucky You*

Carl Hiassen's *Lucky You* was an adaptation for the stage of a New York Times bestselling novel about comic intrigue throughout South Florida. In its staging at the Waterfront Playhouse, Key West (December 20, 2006-January 13, 2007), scenic emphasis was placed upon the creation of a versatile environment that served the many humorous locations of the story with an economy of actual scenic material. The applicant's role was the design, implementation, installation, and programming of an innovative projection system centered on the use of a simulated aquarium as a projection surface. A relatively conventional LCD projection system employing a custom-built rear-projection surface was controlled via DMX, a protocol that, until recently, was only used for lighting control. This was achieved through the use of Rosco International's new control interface, Keystroke. The two primary areas of experimentation in the project were:

1. The creation of innovative digital images that would establish setting and further the plot in a suggestive (rather than a literal) fashion.
2. The integration of slide and lighting control via computerized lighting console.

Poster presentation will deal with the process of image development and the development of techniques for successful DMX slide control and will include both slide prints and production photos.

*This project was made possible by a generous equipment and travel grant from the USF Office of Undergraduate Research.*

Presenter: Brachowicz, Elizabeth  
Second Authors: Jessica Daily<sup>1</sup> James Kotick<sup>1</sup> Mrunal Shah<sup>1</sup>  
Research Mentor: Dr. Ronald Mervis  
Title: Regulation of Dendritic Arborization by the Serine/Theorine Kinase Akt3/Protein Kinase B y in the Developing Mouse Neocortex

In the CNS, the insulin signal transduction pathway regulates many diverse processes ranging from metabolism to memory formation. Binding of insulin to the receptor results in activation of PI3K leading to the activation of the serine/threonine kinase Akt/protein kinase B. In mammals, three highly conserved proteins, Akt1, Akt2, and Akt3, comprise the Akt family. Akt3 is the predominant isoform, representing about half of total Akt protein and is the most prevalent isoform in the cortex. Akt3 is required for normal brain growth; Akt3-deficient mice demonstrate a 20% decrease in brain size. This reduction in brain size is a result of both decreased cell number and diminished cell size caused by lowered neuronal complexity. Signaling through the PI3K-Akt pathway can modulate both the size of the neuronal cell body and dendritic branching. Using Golgi-stained preparations, compared to the wild-type controls, analysis of the apical branching of parietal layer V pyramids of Akt3-deficient brains showed a reduction of the dendritic arbor 60  $\mu\text{m}$  away from the soma ( $p < 0.0001$ , Wilcoxon test). Complete dendritic arbor for apical and basilar trees also showed a significant reduction ( $p < 0.0001$ , Wilcoxon test) in Akt3-deficient mice. Thus, the serine/threonine kinase Akt3 helps regulate normal brain growth and dendrite arborization.

Presenter: Buitrago, Ernesto

Research Mentor: Dr. Sherman Dorn

Title: The Epistemological Assumptions of USF Researchers and their Connection to a Neural Network

This paper explores the epistemological assumptions of ten (10) University of South Florida (USF) researchers in fields as diverse as medicine, biochemistry, sociology, philosophy, and international affairs. This paper contains specific questions that were asked to the researchers regarding their acquisition of knowledge and/or data. Their responses were recorded through an audio recorder and transcribed into this paper in where I examined their responses and found cognitive comparisons and fundamental characteristics that these researchers share. These comparisons are grouped in clusters from which there are a total of three (3), the human expression cluster, the cluster of reference, and the numerical cluster. I employed logic and the philosophical arguments of Rene Descartes, David Hume, St. Augustine, St. Francis of Assisi, and Aristotle in order to identify the cognitive comparisons, which then led to the discovery of a neural network, which is a method of sharing ideas and thoughts when acquiring knowledge. This paper will show the similarities and/or differences between researchers and is significant because it will help the general public and the USF community understands the dynamic research practices of its own researchers and the possible links between disciplines.

Presenter: Centko, Ryan

Research Mentor: Dr. Bill Baker

Title: Tracing the Tryptophan Pathway: Elucidation of Secondary Metabolic Pathways via  $^{13}\text{C}$  Labeling

The pigments chemicals, Erebusinone and Erebsinonamine, of the sponge *Isodictya erinacea*, are two important predatory defense chemicals. These two chemicals it has been found inhibit the molting of the sponge predatory arthropods known as amphipods. These chemicals are thought to be created in a biosynthetic pathway, which has already been described starting from the amino acid Tryptophan. The intermediates of this pathway are N-Formylkynurenine, 3-Kynurenine and 3-Hydroxykynurenine. This pathway is in-fact the path described for production of the naturally occurring molt regulator in all arthropods called, Xanthurenic acid. We are, therefore, creating these  $^{13}\text{C}$  labeled intermediates, which are linked to the Tryptophan path. These will be taken into the field and fed to the sponge to prove, through labeling and extensive NMR studies, that this is indeed the correct biosynthetic pathway the sponge uses to create these defense chemicals.

Presenter: Chantani, Brandon  
Second Authors: Ruizhi Wu  
Research Mentor: Dr. Kirpal Bisht  
Title: The Synthesis of 2,3-Di-O-Isopropylidene-L-Threitol

Biodegradability, biocompatibility, and low toxicity are characteristic of the polycarbonates. In 1932, Carothers et al. first synthesized poly-trimethylene carbonate from thermal polymerization of 1,3-dioxan-2-one (TMC). Polycarbonates bearing functional groups such as free hydroxyl groups, which can be modified selectively, can be utilized in many applications of drug delivery, especially concerning the timed release of drugs in the body. 2,3-Di-O-isopropylidene-L-threitol is a monomer that can form such functional polycarbonates by polycondensation or ring opening polymerizations. The scheme of synthesis of the optically pure 2,3-Di-O-isopropylidene-L-Threitol is through two step reactions starting with the naturally occurring material, L-tartaric acid. As depicted in the reaction scheme below, the synthesis began with the simultaneous one-pot protection of both the hydroxyl and carboxylic acid groups of L-tartaric acid as dimethyl ketal and methyl esters, respectively, to yield methyl 2,3-O-isopropylidene-L-tartrate in 89% yield. Then methyl ester was then reduced by lithium aluminum hydride (LAH) resulting 2,3-Di-O-isopropylidene-L-Threitol with a 71% yield. The  $[\alpha]_D^{25}$  of each compound was in agreement to that recorded in the literature.

Presenter: Chiselko, Kristin  
Research Mentor: Dr. Shayne Reynolds  
Title: Psychopathy Among Females: The Unique Contributions of Impulsivity and Antagonism on Specific Outcomes

Psychopathy has proven to be a robust construct in understanding antisocial behaviors. However, many studies have relied on incarcerated, male samples. Much less is known about psychopathy among females residing in the community. Some evidence suggests that psychopathy may be expressed differently among females (Hamburger et al, 1996; Vitale & Newman, 2001), but much of this research has been limited to incarcerated populations. The current study examined the relationship between Levenson's Self- Report Psychopathy Scale (LSRP; Levenson, Kiehl, & Fitzpatrick, 1995) and substance use and non-drug offending behavior among 47 female who responded to newspaper advertisement. Preliminary results indicate that the impulsivity component of psychopathy is related to substance use, while the interpersonal antagonism component of psychopathy is related to non-drug offending behavior. This pattern of findings suggests that different factors of psychopathy are differentially related to specific antisocial behaviors. This may have implications for preventions and interventions for females.

Presenter: Cognac, Glen  
Second Authors: Kimberly A. Badanich, MA  
Research Mentor: Dr. Cheryl Kirstein  
Title: Intra-Nucleus Accumbens Septi Cocaine Perfusion and Conditioned Place Preference in Early Adolescent Rats

There is limited knowledge about the effects of cocaine administered directly into the brain of adolescent rats; although similar research has been completed with adult rodents. The nucleus accumbens septi (NAcc) is one brain region that mediates drug addiction. The aim of the present study was to determine if intra-NAcc cocaine perfusions would elicit a conditioned place preference (CPP) in early adolescent rats. Guide cannulas were surgically inserted into the NAcc and rats were given access to two CPP chambers. One chamber had vertical stripped walls and wire flooring while the other chamber had horizontal stripped walls and sandpaper flooring. Cocaine perfusion was always paired with placing the rat in one chamber, on odd trials, while cerebral spinal fluid (CSF) was paired with placing the rat in the alternate chamber on even trials. Preliminary data suggests that early adolescent rats express a preference for the cocaine-paired chamber. These data are the first to examine the effects of cocaine on the NAcc in regards to the adolescent brain, and adds to the understanding of drug-induced conditionability in adolescent rats.

Presenter: Collins, Leya  
Research Mentor: Dr. Robert Tykot  
Title: Ancient Diets at Chokepukio, Peru: Stable Isotope Analysis

The purpose of the Chokepukio project is to gain a detailed picture of human diet in a Cuzco Valley, Peru population as well as to identify how the rise of the Inca Empire impacted the domestic economy and the subsequent diets in the local population. Analysis of stable carbon and oxygen isotope ratios provides quantitative information on the types of foods consumed, especially maize. I have prepared 33 human tooth enamel samples from Chokepukio, representing the Formative thru Inca time periods, in the Laboratory for Archaeological Science at USF. The preparation included drilling the sample from the tooth and chemical processes to remove unwanted biological materials with weighing of the sample at all steps in the process, and the analyses were performed using a stable isotope mass spectrometer. I interpret the tooth enamel results (which represent childhood diet), along with the previously analyzed bone collagen and apatite samples from the same individuals (which represent adult diet), and evaluate dietary differences based on gender, time period, and age. The results are then compared with other isotope data for Andean South America to assess geographical variation and chronological change in diet, during the development of the Inca Civilization.

Presenter: Corsentino, Elizabeth

Research Mentor: Dr. Victor Molinari

Title: Understanding the Experiences of Family Caregivers for Older and Younger Adults with Serious Mental Illness (SMI)

Limited research attention has been devoted to understanding the challenges facing family caregivers as persons with longstanding psychiatric problems, or serious mental illness (SMI), age. Results from a pilot study suggest that caregivers remain under a tremendous amount of stress as their loved ones age, and few have plans for the future care needs of their loved ones. For the present study, caregivers were recruited for an online survey about their experiences through an advertisement in *The Advocate*, a newsletter sent quarterly to members of the National Alliance on Mental Illness. It is anticipated that: 1) caregiving will be more stressful as persons with SMI age, 2) level of stress involved in caregiving will differ among sibling- and parental-caregivers, 3) caregivers of older adults with SMI will not have significantly more plans for the future care of their relative than caregivers of younger adults with SMI, and 4) parent- and sibling-caregivers will differ in their level of planning for the future. The results of this study will be a valuable step toward improving the support caregivers receive as their loved ones age and will perhaps help ensure that relatives with SMI remain in the environment that most adequately fulfill their unique needs.

Presenter: Craig, Christine

Research Mentor: Dr. David Drobles

Title: Working Memory and Attentional Bias Among Smokers

Previous studies have shown smokers show increased psychological and behavioral reactivity to smoking cues. Importantly, various reactions to smoking cues have been predictive of relapse following an attempt to quit smoking. Researchers have increasingly used paradigms adapted from cognitive psychology to investigate information processing aspects of drug cue reactivity. To date, no research has studied attentional biases in smokers in the context of a working memory task. Attentional bias in the context of working memory may provide a more sensitive and externally valid index, as working memory tasks may better relate to everyday life than previously used paradigms. This study explores whether attentional bias for smoking-related stimuli can be demonstrated within a working memory task. The purpose of this study is to compare the results of smokers and non-smokers on the N-back working memory task to determine if there are differences in working memory reflective of an attentional bias to smoking-related words. Twenty smokers and twenty non-smokers will complete the N-back task. The N-back task requires the participant to respond as quickly and accurately as possible regarding whether a stimulus appeared N trials previously. Since we are using the task to assess attentional bias to smoking versus nonsmoking related content, smoking-related and nonsmoking words are used as stimuli. The primary hypothesis is that smokers will remember a higher proportion of smoking-related words relative to nonsmoking words, and this effect will not be evident in nonsmokers. We predict that smokers will show greater attentional bias to smoking-related words as indicated by both working memory and reaction time to smoking-related words, and that level of dependence and other smoking-related variables will predict the degree of attentional bias.

Presenter: Daily, Jennifer

Second Authors: P.R. Sanberg, C.D. Sanberg

Research Mentor: Dr. S. Garbuzova-Davis

Title: Neonatal Enzyme Replacement Therapy in a Murine Model of Sanfilippo Syndrome Type B by Human Umbilical Cord Blood Cells When Transplanted into Pregnant Mice

Sanfilippo syndrome type B is an autosomal recessive disorder characterized by a deficiency in  $\alpha$ -N-acetylglucosaminidase (Naglu), an important enzyme in the breakdown of heparin sulfate. Because MPS IIIB can be detected in the early stages of pregnancy, prenatal enzyme replacement therapy may be most beneficial.

Our previous study (Garbuzova-Davis et al., 2005) showed that mononuclear human umbilical cord blood (MNC hUCB) cells, when transplanted into heterozygous females on the fifth day of pregnancy, migrated across the placenta and diffused into the embryos (E12.5). Cells were found in the brain and spinal cord, as well as in all the major abdominal organs of the embryos. The study also showed that the MNC hUCB cells corrected the enzyme deficiency in all embryos.

In our current study, two different doses of MNC hUCB cells ( $3 \times 10^6$  and  $9 \times 10^6$ ) were transplanted into the mother on the fifth day of pregnancy. Our results showed that Naglu enzyme activity was corrected in the pups at birth when  $9 \times 10^6$  cells were transplanted. The enzyme was not corrected in the neonates when the  $3 \times 10^6$  cell dose was transplanted. MNC hUCB cells are a potential treatment for Sanfilippo type B to correct deficient Naglu enzyme by transplantation into pregnant mice, but the correction of the enzyme activity in neonates is dependent on the dose of MNC hUCB cells transplanted.

Presenter: Daniels, Jessica

Research Mentor: Dr. Bill Brewer

Title: Costume Design for Harold Painter's *The Birthday Party*

This project is a costume design of Harold Pinter's *The Birthday Party*. The purpose is to create a surreal world within mid to late 1950s, utilizing costumes to help define the characters within this unusual environment and bring a bit of reality to the surreal. It includes the process of creating the concept, gathering the research, defining the characters, rendering the character on paper and realizing the designs on stage. This project displays the process of a costume design as well as the result of understanding the character and contributing to the visual whole.

Presenter: DiCamillo, Anthony

Second Authors: Mrunal L. Shah 1,4, James Kotick 1,4, Mohamed R. Mughal 5, Mark P. Mattson 5

Research Mentor: Dr. Ronald Mervis

Title: Paradoxical Cortical and Hippocampal Dendritic Branching and Spine Changes in the Aging Male and Female Triple Transgenic Mouse Model of Alzheimer's Disease

The triple transgenic mouse model of Alzheimer's disease was generated by expressing three mutant genes, APP, PS1 and tau, linked to inherited forms of dementia. The triple transgenic mice exhibit age-related amyloid and tau pathology that is associated with synaptic dysfunction and memory impairment. From randomly selected Golgi stained neurons, we evaluated neocortical layer V and hippocampal CA 1 dendritic spine density on the basilar tree and main apical branch and basilar dendritic branching in aging fifteen month-old triple transgenic male and female mice and age-matched controls.

Branching analysis of the basilar dendritic arbor of both of the triple transgenic mice, males and females, showed a significant mild-to-moderate branching atrophy in the distal two-thirds of the tree, approximately 15%. Conversely, for both aging males and females, there was an overall significant average increase in spines of about 50%, for the layer V cortical neurons. Similar results were found in the hippocampus. A possible mechanism for the paradoxical dendritic findings is that amyloid-beta, the PS1 and tau mutations promote enhanced calcium influx and release from the ER; therefore, this would tend to cause dendritic pruning, microtubule depolymerization in the shafts of dendrites, but could also promote spine formation by actin polymerization.

Presenter: Dickerson, Stephanie

Research Mentor: Dr. Ruth Huntley Bahr

Title: Spelling Patterns in African American English Children

The Phonological, Orthographic, and Morphological Assessment of Spelling (POMAS, Silliman, Bahr, & Peters, 2006) is a qualitative assessment of linguistic errors made while spelling. This approach has been useful in describing patterns that differentiate typically developing children from those with a learning disability. Since current research has suggested that use of African American English (AAE) can interfere with spelling, it would be interesting to note if the POMAS can identify these children from speakers of Standard American English.

Eighty typically developing African American children in grades 1 ( $n = 40$ ) and 3 ( $n = 40$ ) in three low-income schools participated. They were determined to be AAE speakers by observing their use of phonologic and/or morphosyntactic dialect features when retelling a story. The students took a grade-appropriate spelling test and the errors were analyzed with the POMAS. The frequency of linguistic category errors was compared across types and grades. It was noted that orthographic errors predominated at both grade levels. Frequent error types within linguistic category will be considered for each grade and the results will be compared to existing data on the spelling patterns of children in grades 1-4 (Fawcett, Bahr, Silliman, & Berninger, 2006). Educational implications will be explored.

Presenter: Dix, Samantha  
Research Mentor: Dr. David Williams  
Title: *The Birthday Party* Lighting Design

*The Birthday Party* by Harold Pinter is a strange story of a troubled young man boarding with an elderly couple living in a small English seaside town. When two other men come to stay at the house trouble follows. When the play was originally produced the script was enough to shock and engage the audience. Today's audience is anesthetized to ambiguity and requires more from a production to have an impact. Although Pinter advocated a strictly realist style in the production, a surrealist style would be very effective in a production for today's audience. Unexpected angles, disintegration and distorted proportions help to discomfort the audience.

I started to design lights for this production in December of 2006. The process started with a production meeting with the director and other student designers to discuss the concept of the production. I then found visual research to convey my intentions to the director. When a finished model was completed by the scenic designer I photographed it and used Photoshop and pastels to do storyboards for the scenes. I also drafted a lighting plot and supervised its installation and cueing.

Presenter: Farrar, Corina  
Research Mentor: Dr. Maggie Kusenbach  
Title: Mobile Homes, Stigma and Media Reports: An Ethnographic Study in the Bay Area

Residents of mobile homes and mobile home parks frequently deal with negative reactions from others and with stigmatizing representations in the popular media. (Baker 1997, Jan 25:3) According to Goffman, through the treatment the individual gives to others and receives from them, he comes to have a definition of himself. (1971, p.30) To date, very little research has been conducted on the question of how the mostly (negative) stereotypes of mobile home living affect the daily lives and identities of residents. (MacTavish, 2001 p.3) This study has two goals: first, to analyze the portrayal of mobile home parks and mobile home residents in a selection of newspaper articles. Using discourse analysis, I analyzed 25 articles recently published in 5 Florida newspapers to determine the construction of discursive objects in the text, the functions these objects serve and the implications made. Second, to investigate residents' interpretations of media representations, and how these stereotypical images impact their daily routines and identities. To this end, I conducted in-depth interviews with members of three households living in two Bay Area mobile home parks, two individuals and one couple and also analyzed 4 additional interviews conducted by faculty mentor and fellow research assistants. Park residents often spoke of themselves as outsiders and felt the need to defend their choice of home and their behaviors to assure that they do not fit the stereotypes. Mobile home park residents are often discredited as a population by media and management of this over-generalized misrepresentation becomes part of the park dwellers social role and creates conflict in their self-image. Some of my research was linked to a larger study on community resources and disaster resilience in west-central Florida mobile home parks.

Presenter: Ferrer, Gabriela  
Research Mentor: Dr. Kevin Yelvington  
Title: Hawaiian Identity and Sovereignty

Since Captain James Cook sailed to the Hawaiian Islands identity has been a struggle for the natives or Kanaka Maoli. In modern times, there has been cultural and political resistance to American or other colonial cultures as well as conformity to them. As a consequence native voices in Hawaii and around the world need to continue to find new ways to create and express their identity as we will see later with the classifications of urban and rural native Hawaiian identities. These are the issues I am investigating for my honors thesis; the issue of Hawaiian identity in modern times. This is an important and complex issue pertaining to the field of anthropology because as culture is ever changing one must know and investigate what, how, and why the native Hawaiians identify, and its impact in their lives. It is also important to understand the multidimensional aspects of identity to avoid making the assumption that Hawaiian identity universally follows one tradition. The purpose of my research is three tiered: to research the native Hawaiian movement and compare it on a global scale, research why natives have resisted colonialism and create new movements, and compare and contrast different constructed Hawaiian identities/cultures.

Presenters: Finch, Jacquelyn and Williams, Shana  
Research Mentor: Dr. Michael Gibbons  
Title: Covenants, Contracts and Citizenship

This research paper will explore the covenants established in Hebrew religious texts and the Old Testament, including the Noahide Laws and the Mosaic Covenant and their relation to contemporary politics. Our hypothesis is that many of the assumptions and practices of contemporary politics are influenced by the idea of a covenant that originates in the Old Testament. At several places, the Old Testament speaks about a covenant between God and human beings. Sometimes this Covenant is unilateral, at other times it is more of a bilateral agreement between God and the Israelites. We intend to track the development of the concepts and practices of a covenant between God and Israel.

The importance of this idea can be found in the fact that beginning in the modern period the notion of a social contract, heavily influenced by the Old Testament idea of a covenant, was one of the foundations of modern politics. Comparisons will be drawn between those biblical covenants and social contracts in later Western civilization. There will be a discussion of the influence of these ancient laws exemplified in U.S. society by the relationships between the government and the governed and between individuals within a society.

By examining the historical origins of the concept and practice of covenant, we explain the influence of those ideas that sometimes are ignored in contemporary discussions of society and politics.

Presenter: Finkbeiner, Lauren

Second Authors: A.M. Maldonado

Research Mentor: Dr. Cheryl Kirstein

Title: Effects of Social Interaction on Subsequent Alcohol-Related Behaviors in Adolescent Rats

The ability of alcohol to facilitate social interactions plays an important role in adolescent drinking. The demonstrator-observer paradigm is an animal model that has been used to assess the effects of social interactions on alcohol-related behaviors in adolescent animals. The demonstrator is the animal exposed to ethanol and the observer is the animal that after interacting with the demonstrator is tested for changes in alcohol-facilitated behaviors. The present experiment expanded on previous work assessing the effects of different types of social interactions on subsequent alcohol drinking. The effects of social interactions with different types of demonstrators on voluntary alcohol intake were assessed. Specifically the effects of social interactions with an alcohol-free and alcohol-intoxicated same-sex littermate or an age-matched conspecific was assessed on voluntary alcohol intake. Demonstrators were administered water or 1.5 g/kg/ig ethanol and allowed to socially interact with observers for 30 minutes. Subsequently, observers were allowed voluntary access to alcohol overnight for 13 hours using a two-bottle choice paradigm. Results indicate that observers that interacted with siblings consumed significantly more alcohol than observers that interacted with conspecifics. This effect was observed regardless of whether the observer socially interacted with an alcohol-free or alcohol-intoxicated demonstrator. The present results support the notion that the demonstrator-observer paradigm can increase voluntary alcohol intake using siblings as the dyad. However, the demonstrator-observer paradigm has not been assessed in age-matched conspecifics. The nature of access to alcohol does appear to alter intake, with animals allowed voluntary access to alcohol using a two-bottle choice paradigm rather than one bottle do not show an increase in voluntary alcohol intake after socially interacting with an alcohol-intoxicated peer. Results from the present experiment indicate that the demonstrator-observer paradigm is sensitive to experimental conditions when assessing its effects on alcohol-related behaviors in adolescent animals.

Presenter: Foyle, Kelly

Research Mentor: Dr. Darlene DeMarie

Title: The Relation Among Self-Reported Health, Memory and Terminal Decline in Older Adults

Previous cognitive research suggests there is a time period in which individuals show a decline in cognitive performance shortly before death, a phenomenon known as “terminal decline” (Riegel & Riegel, 1972). There is also growing research on the relation between self-perceptions of health and longevity (Slade et al. 2002). The purpose of the present study was to investigate the complex relation among older adults’ self-perceptions of health, memory and knowledge, and terminal decline.

Sixty-one adults aged 60-90 years old volunteered to be tested as part of a memory study in 1988-1992. They were given an episodic memory test (bird recall) and three different knowledge tests (grouping birds into meaning-based categories, listing birds, and matching birds with categories). In addition, participants completed questionnaires about self-ratings of their general health and memory. Nearly 20 years later, dates of death of the participants were obtained.

The Regression Analyses that were conducted revealed that bird recall could be predicted from participants’ knowledge but that time until death also was a significant predictor when controlling for knowledge. Additional preliminary results revealed a significant positive correlation between self-ratings of health and longevity of older adults. Results demonstrate important implications for positive self-images among the aging population.

Presenter: Foyle, Marisa

Research Mentor: Dr. Judith Bryant

Title: Degrees of Affection Expressed by Boys and Girls at Different Ages

The present study involves age and gender differences in verbal expressions of affection. Little research has focused on children’s expression of positive emotions like affection, while most concentrates on how children express negative emotions like anger. The present study is a replication and expansion of a study conducted by Bryant and DeHart (2005). We interviewed 84 children (42 boys and 42 girls) ranging from 5 to 10 years. We conducted structured interviews in which we asked children questions about the way they sign birthday cards to different recipients (relative, teacher, opposite-sex peer, same-sex peer) and then transcribed the interviews. I coded the responses along a “level of affection continuum” (“love,” “your friend/student/grandson,” “sincerely,” or “by/from [name].”) Preliminary results indicate that most children vary the closing of their cards depending upon the recipient (see Figure). Boys readily used “love” for relatives and less for teachers and opposite-sex friends, but none of the older boys used “love” for same-sex friends (e.g., “He would think I was gay”). Girls used “love” across all recipients except for opposite-sex friends (e.g., “I’m not his girlfriend”). These results have implications for our understanding of the development of social relationships.

Presenter: Gaboton, Péguy

Research Mentor: Dr. My-Lien Dao

Title: Understanding the Effects of Anti-Helminthic Drugs on Non-Small Cell Lung Cancers Using Manatee Lymph Node Cells as a Model

Cancer is a disease characterized by uncontrollable cellular proliferation. Since current anti-cancer drugs also attack normal rapidly dividing cells, cancer researchers in the search for non-toxic drugs, found out that a number of cancers, such as lung cancer cells, A549, could be treated with doses of anti-helminthic drugs that are non-toxic to mammalian cells such as albendazole. Culture of the cells that were isolated from an enlarged lymph node of a manatee carcass in Dao lab at USF in 2002, displayed characteristics of cancer cells such as rapid growth rate and indefinite propagation in culture. Analyses of these cells revealed infection with *Encephalitozoon hellem*, a species of microsporidia, a type of parasitic protozoa. Upon treatment with albendazole, the manatee cells, designated MLD10, displayed a tremendous decrease in number with time. Those observations raised questions on the correlation between cancer, microsporidiosis and anti-helminthic drugs. We hypothesize that either the manatee cells are cancerous and that manatee number 10 had lymphoma or that microsporidiosis could influence cellular proliferation. The purpose of this study is to use the MLD10 cells as a model to further investigate the influence of microsporidiosis on cellular proliferation as we extrapolate our observations to A549 cells, which we found to also be infected with microsporidia.

Presenter: Garcia, Andre

Research Mentor: Dr. Alberto Sagues

Title: Non-Destructive Assessment of the Coating Condition of Epoxy Coated Rebar in Concentrate

Multiple methods have been used to protect bridge substructures from corrosion damage of reinforced steel bars (rebars). Application of epoxy coated rebar (ECR) is a popular protection method used, yet has encountered multiple problems in Florida. The objective of this work is to use the non-destructive method of Electrochemical Impedance Spectroscopy (EIS) to determine the condition of ECR. Defects (pores) in coatings allow the passage of current to an extent measured by the pore conductance  $C_{po}$ . EIS provides data which reveals the value of  $C_{po}$  and thus the fraction of coating flaws. A functional relationship with inputs of coating thickness, surface area of the rebar, dielectric constant, and the  $C_{po}$  is applied. Methodology will mostly focus on the use of EIS on ECR in concrete cores from bridges taken during a cooperative University of South Florida – Florida Department of Transportation (USF-FDOT) study.

Presenter: George, Asha

Second Authors: Andrea D. Shluck<sup>1,3</sup>, Mabel A. Avilas<sup>1,3</sup>, Stephen J. Ahern<sup>1,3</sup>, Sandra Acosta<sup>2</sup>, Daniel Paredes<sup>2,3</sup>

Research Mentor: Dr. Paula Bickford

Title: Memory Consolidation of Delay Eyeblink Conditioning in Rats

The delay classical eyeblink conditioning task in rats is a paradigm that depends primarily on the cerebellum. Several neuronal pathways are involved in the memory formation process for this task, including the noradrenergic projections from the locus coeruleus to the cerebellum. Previous studies from our lab have shown that blocking beta-noradrenergic receptors with propranolol prior to training sessions significantly impairs acquisition in the eyeblink task in rats. In a recent microdialysis study, we have found that there is a significant elevation in extracellular norepinephrine (NE) which occurs during the training sessions. Interestingly, the increased overflow of NE remains elevated for about 60 minutes post training session on day one; however, this long lasting abundance of NE release decreases over the days of training. We have established that blocking noradrenergic receptors with localized infusions of propranolol into cerebellar lobule HVI and interpositus (IP) significantly impairs acquisition of conditioned responses. These results led us to speculate that the NE overflow that outlasts the training session might have involved in the consolidation of the learned behavior as well as the activation of NE receptors and the subsequent downstream signaling activation of cAMP-dependent protein kinase A (PKA) in the cerebellum. In order to test this hypothesis, 1  $\mu$ L of propranolol (100  $\mu$ M) or vehicle (artificial Cerebral Spinal Fluid- aCSF) was ipsilaterally infused into the cerebellar lobule HVI at different times (5, 60 and 120 min) post training session. The rats which received a local infusion of propranolol (5 and 60 min post training) showed a much slower learning rate compared to the control group (aCSF). These data indicate that elevated NE levels after training session may be playing an important role in the process of memory consolidation. Also ipsilateral, localized infusions (5, 60, 120 min post training) of Rp-cAMPS (PKA inhibitor) into cerebellar interpositus (IP) significantly impairs acquisition of conditioned responses. In conclusion, this data shows that consolidation of new cerebellar dependent learning requires the activation of noradrenergic receptors and subsequent downstream activation of cAMP- dependent PKA in order to consolidate the newly learned task.

Presenter: Ghosh, Mimi

Research Mentor: Dr. Jacqueline Messing

Title: Social Activism for Gender and Sexuality Through Anthropological Participatory Action Research

The social climate of the times is one in which socio-political activism is required by individuals of all ages and from all walks of life. The United States has become the epicenter of controversy over the meaning of gender equality and its relevance to sexual identity as a means of defining the individuals' rights and shaping their socio-political identities as citizens. With literary research in the theories and educational pedagogies of psychologists, philosophers, and educators alike, the background is set to implement an actual research project based on the methodologies of Participatory Action Research (PAR). With the conceptualization and implementation of this student-based project, I look to identify the key factors of pragmatic idealism developed through research-activism. The basic principles of this real-world example are:

- Creating a research-action based community project
- Establish within the foundations of a student organization;
- Created by students, for students
- In the Participatory Action Research methodology
- Based on their understanding of gender/sexuality,
- Race/ethnicity,
- and socioeconomic status

Through the use of an anthropological approach and theories of the psychology of motivation, development and existential philosophy to understanding the relevance and overall implications of its meaning, it is surmised that a more critical conscientiousness of gender and sexuality will ensue. Also that it will result in a social and political transformation in the local community. As the transformation may take place at a personal level initially, it is anticipated that continuing such research-activism will lead to further, far-reaching, socio-political activism.

Presenter: Gibson, Liz

Research Mentor: Dr. B. Nickels

Title: The Contemporary Alchemic Image

A year's worth of collected images, three months of set design, and one month of model building all culminate to create a contemporary compendium of the Alchemic Language. Influenced by the twenty-two color plates in Solomon Trimosin's *Splendor Solis*, these contemporary images are my personal contribution to the ever evolving visual language of alchemy. I have included thumbnail prints from the *Splendor Solis* as well as the initial sketches and plans for this thesis. The esoteric nature of Alchemy allows for the mystery behind the meaning of each image and the ineffable nature of visual art supports the absence of words. In Trimosin's alchemic tale the king and queen go through a metaphoric journey of purification. In my alchemic effort, the viewer is king and queen, to be crowned by an anthology of assorted contemporary images arranged together to tell the present day tale of Alchemy.

Presenter: Gidus, David

Research Mentor: Dr. Ellen Verdel

Title: Identification of Africanized Honey Bees Specific Proteins via Mass Spectroscopy

Africanized Honey Bees are the result of 26 queen bees escaping a hive in Brazil in 1957 under the direction of Warwick E. Kerr. Since then, these bees have gradually migrated north into the United States. From this, researchers want to differentiate between Africanized Honey Bees (AHB) and their cousins European Honey Bees (EHB). From this occurrence, it is necessary to differentiate between the two types of proteins. From current research, researchers have isolated three different proteins that are found in 93% of all AHB. Using 2D gel electrophoresis, we have been able to isolate proteins from both AHB and EHB. However, we don't know the identity of these proteins. From these purified and isolated AHB proteins, we are using mass spectroscopy to identify the intricate sequence of these proteins. This important step will allow us to further our information and allow us to continue with our research on AHB.

Presenter: Glenn, Kyle

Research Mentor: Dr. Susan Bell

Title: Correlating Water Phosphate Concentration with the Distribution and Degree of Calcification of Two Calcareous Green Algae

The percent calcification of *Halimeda incrassata* and *Penicillus capitatus* were compared in phosphate-rich versus phosphate-limiting coastal marine habitats in Florida. Calcareous algae from the Keys were up to 11% more calcified than those in Tarpon Springs ( $p < 0.001$ ). Differences in water column nutrient concentrations were analyzed and compared to differences in calcification. Nitrogen (Nitrate + Nitrite and Ammonium) levels were similar in both habitats. Phosphate and silicate concentrations, however, were much higher in Tarpon Springs than in the Keys, suggesting that one, or both, of these nutrients significantly inhibits macroalgal calcification. The greater distribution of calcareous algae in the Keys further supports this hypothesis. The lack of calcareous algae in Tampa Bay, where phosphate values twice as high have been recorded, suggests that calcareous algae cannot proliferate in phosphate-rich habitats.

Presenter: Gomes, Joseph

Second Authors: Pasha M Khan, Joshua David Kraft

Research Mentor: Dr. Kirpal Bisht

Title: Chemoenzymatic Synthesis of Furan Analogs via Lipase Catalyzed Desymmetrization

Substituted furan rings are found in many natural products. There has been a great deal of interest in their synthesis stemming from their importance in the biological and pharmaceuticals sector due to their bioactivity. Furan analogs are known to be effective as antimicrobial, anti-inflammatory, and analgesic. Many furan analogs are also found in agrochemicals and perfumes.

Synthesis of chiral furan ring systems is complex and involves the use of many chiral ligands and organometallic catalysts which can be highly sensitive to reaction conditions and both toxic and expensive. In this poster we will discuss the synthesis of cyclopentanoid ring systems via a Pd catalyzed allylation of active methylene compounds otherwise known as Tsuji-Trost reaction and subsequent intramolecular cyclization. These cyclopentanoid ring systems can be further modified to obtain highly substituted furan analogs. The synthesis begins with commercially available dicyclopentadiene which was converted to the allylic acetate via a series of reactions including epoxidation, and palladium catalyzed epoxide opening. The desymmetrization of the allylic-diacetate with lipase to give the (+) mono-acetate is the pivotal stereo-differentiation reaction. The mono-acetate thus obtained was subjected to Tsuji-Trost alkylation which is often used to obtain a carbocyclic ring system and involves a  $\pi$ -allyl Pd complex. The main focus of this work is the use of commercially available lipases to induce chirality in a meso-diacetate. It is important to mention that the stereochemical outcome of the process is dictated by the stereoselective nature of the lipases and avoids the use of chiral ligands which are expensive and involve tedious handling procedure. In future experiments the strategy will be utilized to synthesize more diverse furan analogs for testing of their biological activity.

Presenter: Gooden, Melissa

Research Mentor: Dr. Carlos Zalaquett

Title: The Importance of Parental Involvement, Mentor, and School Counselors on Academic Achievement of Diverse Students

Minority students are lagging behind in education. Despite reported low levels of academic achievement, some minorities do achieve a higher level of education. The importance of three factors: parental involvement, school counselors and mentors in the academic success of a diverse group of students from the George Jenkins and Ronald McNair scholarships will be studied. The students in these two scholarship programs were selected because of their recognized academic achievement. Preliminary results indicate that parents and to some extent school counselors helped students pursue college admission. Formal mentoring was not frequently reported as important for their achievement however, informal mentoring proved to be of assistance. Implications for the education of diverse students are provided.

Presenter: Hanger, Nyssa  
Research Mentor: Dr. Dell DeChant  
Title: Religious Experience Through Poetry

Scholars have recognized that the study of religious experience has an integral place in Religious Studies, but because of its highly subjective and inexpressible nature, there are few suggestions on how to conduct such a study. Joachim Wach contends that a comparative method must be utilized in the study of religious experience, and outlines a definition of an encounter with the Ultimate Reality. The goal of poetry is to describe an experience in words, even if the experience is ineffable; it has the ability to transform the reader's perspective with symbolic language and metaphor. Poetry is perhaps the most apt verbal medium that religious experience can be expressed as well as created. This initial methodology is designed so that the researcher can comparatively analyze their own subjective experience through the oral recitation of poetry or elicit response from listeners about their subjective experience.

Presenter: Harrinauth, Reshma  
Research Mentor: Dr. Vinay Gupta  
Title: Sedimentation of Organic-Inorganic Nano-Composites

Composites of polymers and inorganic compounds can be used to tailor new materials for wastewater remediation, cosmetics, and fuel-cell catalysis. In our research on nano-composites, titanium dioxide ( $\text{TiO}_2$ ) nanoparticles have been incorporated within micron-sized organic particles. The micro-particles are formed from a thermally responsive poly(N-isopropylacrylamide) and contain poly(acrylic acid) that binds  $\text{TiO}_2$ . Loading of the dense  $\text{TiO}_2$  within the porous polymer particle leads to composites that sediment rapidly, which can be useful for gravity separation of these composites. The settling of the composites has been characterized in a turbidometer. In this presentation, the sedimentation behavior will be discussed and its correlation with the weight of fraction of the  $\text{TiO}_2$  within the composite will be demonstrated. The changes in sedimentation times due to thermal response of the polymer will also be presented.

Presenter: Hashmi, Faraz  
Research Mentor: Dr. Watkins  
Title: A Novel Model of Acute Murine Limb Ischemia

The McGivney Hemorrhoidal Ligator band (MHL) is an established model of tourniquet induced hind-limb ischemia-reperfusion (IR) injury in rodents. Using Orthodontic Rubber Bands (ORB), we sought to create a model of hind-limb ischemia that minimizes confounding factors such as crush injury and neurological damage to the area directly below the rubber band by inducing ischemia using the minimum amount of required tension. Ex-vivo measurements showed that ORB exerted significantly less force than the established MHL at a range of physiologically relevant diameters. The force generated by the MHL was up to three times that of the 4.0 oz. ORB. Furthermore, the tension generated by the ORB was constant, while that of the MHL was erratic over different diameters and it decayed over a 90 minute period. In-vivo testing of the ORB confirmed the induction of complete ischemia by two separate methods. Selected ORB produced significantly improved neuromuscular score at 24 hours, which was not related to the degree of ischemia, but most likely related to crush injury in the area directly below the tourniquet. At 24 hours, mice subjected to ischemia and reperfusion (IR) with the ORB retained use of their hind-limbs, while those subjected to IR with the MHL were forced to drag themselves with their fore-limbs. Using the 4.5 oz. ORB, increasing duration of ischemia produced a corresponding decrease in mitochondrial activity after 24 hours of bilateral ischemia. Finally, histological assessment confirmed similar degrees of injury after 1.5/24 bilateral IR. These tests validate the ORB as a reliable and biologically relevant experimental tool to create limb ischemia with minimal artifact.

Presenter: Hastings, Roxanne  
Second Authors: Robyn N. Conmy  
Research Mentor: Dr. Paula Coble  
Title: Using Fluorescence and Absorption to Characterize CDOM in a River-Dominated Environment

Colored Dissolved Organic Matter (CDOM) has been the focus of much study due to its role as a dominant factor controlling light penetration in the coastal ocean. CDOM absorbs ultraviolet and visible radiation. This material interferes with remotely measured chlorophyll and plays a crucial role in the cycling of carbon, pollutant transport, metal complexation, and shading phytoplankton in the surface ocean. The optical properties of CDOM vary considerably with composition, region, and season.

In the West Florida Shelf, a region affected by multiple river systems, the use of fluorescence and absorption techniques can help characterize CDOM from various sources, track water masses, and determine seasonal changes. This dataset includes seasonal sampling of rivers in the Eastern Gulf of Mexico and seasonal cruises to the southern portion of the West Florida Shelf. This data will be used to determine spatial and seasonal variations in CDOM properties on the West Florida Shelf.

Presenter: Holland, Matthew

Research Mentor: Dr. Rudy Schlaf

Title: Theoretical Simulations of an Electrospray Differential Pumping System

Theoretical simulations were performed to investigate the gas flow in a differential pumping stage for an electrospray injection system. Electrospray injection is used to introduce molecular ions directly from solution into the vacuum where they can be deposited without significant contamination. The differential pumping stage was modeled in Comsol, a commercially available flow dynamics and multi physics simulation software package, with the aim to increase transmission of the molecular ions.

Using this software package, the geometry of the electrospray injection system was modeled in two dimensions. The Navier-Stokes formula was used coupled with a thermal expansion model provided by pre-built Comsol libraries in order to solve for the air speed velocity inside the chamber.

Once the model is created and solved, turbulent spots can be located and jet disruptors, focusing funnels, and redesigned injection systems can be created to reduce and eliminate turbulence and increase the transmission of the molecular ions.

Airflow through the capillary caused a backflow inside the chamber. Removing the capillary and creating a smaller orifice decreases turbulence and increases transmission of airflow from the orifice to the end of the chamber. (Jet disruptors are still being researched).

Presenter: Hwang, Patricia

Second Authors: James Kotick<sup>1</sup>, Keri Kalmbach<sup>2</sup>, Barbara Shukitt-Hale<sup>3</sup>, James Joseph<sup>3</sup>

Research Mentor: Dr. Ronald F. Mervis

Title: Dietary Supplementation with Blueberry Extract in the Old Rat Increases Dendritic Branching in Cortical Neurons: An Anti-Aging Neuroplastic Effect

The deleterious effect of oxygen free radicals and its role in brain aging is an important issue. The use of antioxidants to combat this damage is poorly understood. This study attempts to characterize the potential beneficial effects of the antioxidant properties of blueberries (BB) on brain circuitry. Twenty month old male Fischer 344 rats were given either standard diets or diets enriched with BB extract for 2 months. In this preliminary study there were 3 subjects in each group. The cortical neurons of the 22 month old rats were evaluated for the extent of their dendritic branching using Golgi methods which stains the dendritic branching. Two months of BB treatment resulted in a significant increase in dendritic branching in the proximal half of the basilar dendritic arbor of the layer II-III parietal neurons (a 14% increase). This suggests that even in old subjects, BB dietary supplementation may have a beneficial impact on neuronal morphology: it can reverse age-related dendritic atrophy and loss of brain circuits. Work is currently being done using additional subjects and a young control group.

Presenter: Hyppolite, Chivonne  
Research Mentor: Dr. Allison Zager  
Title: Using a Balance System to Determine Fear of Falling

Due to the increasing number of elderly adults in the United States, fall prevention is becoming an increasing concern for those in the health profession – both from cost prevention and injury viewpoints. Falls are the most common cause of injury and related mortality among the elderly population.<sup>[1][2]</sup> Over 30,000 elderly are hospitalized annually in the United States due to falls.<sup>[1]</sup> “By 2020, the cost of fall injuries is expected to reach \$32.4 billion”<sup>[3]</sup> Fear of Falling (FoF) has been defined as a “lasting concern about falling that can lead to an individual’s avoiding activities that he/she remains capable of doing.”<sup>[4]</sup> This exaggerated concern about falling may ultimately limit the performance of daily activities and increase fall risk. FoF has most commonly been assessed through one’s fall-related self efficacy. Studies using these measures of FoF have provided significant evidence that FoF is a significant contributor to falls in the elderly population.<sup>[4]</sup> Physical therapy tests such as the Berg Balance Test and measures of single-limb stance and the timed up and go test are reliable and valid methods of determining and quantifying a patient’s risk of falls related to their ability to balance. Few studies have correlated a patient’s fear of falling with actual balance deficits.<sup>[5]</sup> Measuring FoF as confidence in one’s self perceived ability to perform everyday basic tasks without falling is self-perception and not a measurement of actual skill.<sup>[4]</sup> The aim of this study is to determine if there is a correlation between a positive score on the Modified Fear Efficacy Scale (MFES) and a particular cut-off on their performance of the Biodex Balance System Fall Risk Test. We hypothesize that those with a positive score on the MFES will score poorly on the Biodex Fall Assessment Risk Test. Individuals who are blind and/or have a history of hip fracture, stroke, LE amputation, vestibular disease, or are cognitively impaired will be excluded. Subjects will complete an MFES, evaluation for quadriceps strength, dorsiflexion strength, and range of motion (ROM) of the ankle on the Biodex Balance System Fall Risk Test.

Presenter: Jackson, Melanie

Research Mentor: Dr. Kevin Thompson

Title: Variables Associated with Self-Efficacy to Remain Abstinent in Pregnant Spontaneous Tobacco Quitters

An estimated 18% of pregnant women continue to smoke during pregnancy, thus increasing their risk of premature delivery, stillbirth and other consequences. Many women will quit smoking while pregnant; nevertheless, it has been found that roughly 60% of women who quit during pregnancy will relapse by 6 months postpartum. Self-efficacy, which is one's confidence in their ability to achieve a specific goal, has been shown to be useful in smoking cessation and abstinence. There were 714 pregnant spontaneous quitters recruited for this study who filled out baseline questionnaires including the Partner Interaction Questionnaire (PIQ). A relationship between the variables will be examined by using correlations of the above variables. Hypothesis 1 for the study is that intentions to breastfeed and intentions to take maternity leave will have a positive correlation with self-efficacy to remain abstinent postpartum. The second hypothesis is that high weight loss intentions will have a negative correlation with self-efficacy to remain abstinent. The third hypothesis is that partner support will be perceived as more effective if the partner is also a smoker and result in greater self-efficacy to remain abstinent. Also we predict that partner support will be less effective if the partner is not a smoker.

Presenter: Joustra, Caryssa

Research Mentor: Dr. Daniel Yeh

Title: Modeling of Water Use and Recycling in a Green Building

As the world faces a deficit of resources, the concept of sustainability is increasingly necessary. Green buildings provide just one example. Using the visual modeling software STELLA, the water budget for any building, conventional or green, can be analyzed; providing a tool for green building decision-making and teaching sustainability.

Presenter: Kochman, Deborah

Research Mentor: Dr. Suzanne Stein

Title: A Glimpse at Images and Ideals of Kingship and Succession in Shakespeare's "The Tragedy of Hamlet, Prince of Denmark"

This research paper begins by exploring the foundational history of Shakespeare's Hamlet by taking a glimpse at the evolution of the ancient Scandinavian legend founded in the oral tradition, through to versions by Saxo and Belleforest, and ultimately its dramatic treatment by Shakespeare. From that point, the focus of the research is on issues of kingship and succession in Denmark but more significantly, how Shakespeare's Hamlet is a more complex literary treatment as it reflects the moral, philosophical and political climate of Elizabethan England. However, the drama still manages to represent universal figures of leadership. The research considered is a review of the key scholars who discuss complex issues and Elizabethan concepts such as usurpation, the Divine Right of Kings, the Christian humanist prince and the King's Two Bodies. By applying the concepts and the scholars' various conclusions to the text of Hamlet the research reflects not only Shakespeare's view of kingship and succession and the drama's significance to that period in England's history, but that the true art and masterpiece of the work is that the drama sets forth images and ideals of leadership that audiences "for all time" to reflect upon.

Presenter: Kozlenko, Nonna

Second Authors: Dr. William E. Haley

Research Mentor: Dr. Sandra Reynolds

Title: Depressive Symptoms Increase Mortality and Disability in Older Adults: A Prospective Study of Life Expectancy

We use analysis of active life expectancy to examine whether depressive symptoms in older adults negatively affect mortality and disability, independently and in the presence of chronic diseases. Data from the first three waves of the Asset and Health Dynamics Among the Oldest Old (AHEAD; 1993-1998) were used to estimate total life and active life expectancy for 7,132 men and women 70 and older with and without high depressive symptoms, and with and without cancer, diabetes, heart disease, or stroke, all assessed at baseline. Logistic regression is also used to examine depressive symptoms and health conditions as predictors of the onset of death or disability over the 5-year period.

Depressive symptoms had powerful negative effects on both mortality and disability, especially for men. High depressive symptoms in men led to 4.3 fewer years of survival, and 2.0 more years of life with disability, reducing active life expectancy by 6.4 years. These effects were modified, but seldom eliminated, by controlling for chronic diseases.

Depressive symptoms represent a serious and independent threat to longevity and independent functioning in older adults. Whether experienced alone, or in combination with cancer, diabetes, heart disease, or stroke, depressive symptoms shorten life expectancy and lengthen life lived with

disability. Regardless of presence of chronic diseases, timely diagnosis and treatment of depressive symptoms in older adults may improve both length and quality of life.

Presenter: Landerville, Aaron

Research Mentor: Dr. Ivan Oleynik

Title: First Principles Molecular Reactive Dynamic of Energetic Materials

The understanding of initiation chemistry of shock-compressed energetic materials on the atomic scale is of fundamental importance for developing a predictive theory of initiation of detonation. We have performed first-principles density-functional modeling of reactive molecular collisions of PETN and RDX molecules aimed at elucidating the first chemical events that trigger the chemistry behind the shock wave front. We will discuss fundamental mechanisms responsible for the transformation of mechanical energy from the shock wave into molecular degrees of freedom that result in excitation of a reaction mode and eventual bond breaking. We will also discuss the stereochemistry of initial reaction events, unimolecular, bi-molecular or multi-molecular nature of initial reactive events and the relationship of the simulated reactive collisions with a non-equilibrium shock wave environment.

Presenter: Lastra Vicente, Rosana

Research Mentor: Dr. Micheal D. VanAuker

Title: Hemodynamic Factors Affecting the Functioning of the Aortic Valve

Early stages of aortic valve disease involve a subtle increase in leaflet stiffness, which affects valve performance seen particularly in the opening and closing of the valve. In this study a pulse duplicator, which recreates physiologic flow waveforms was used to evaluate how changes in experimental conditions such as downstream resistance and flow rate affect the opening and closing patterns of valves with varying stiffness. A photographic technique which allowed for analysis of valve leaflet motion revealed various trends in relation to the flow, resistance, and stiffness of the valves. Increased flow and resistance lead towards shorter opening and closing times for the valves, while increased valve stiffness demonstrated an increase in the opening and closing times of the valves. Pressure drops across the aortic valves decreased during the closing cycles as the area decreased, and increased during the opening cycles as the area increased. From the study, it can be concluded that hemodynamic factors influence the severity of the disease as demonstrated by the trends observed during the opening and closing cycles of the valve.

Presenter: Lotts, Vivian

Research Mentor: Dr. Christine Ruva

Title: Do Personality Differences Matter? The Effects of Misinformation and Delay on Eyewitness Performance

This study explored the effects of misinformation and delay on source memory (SM) errors. It also explored the relationship between personality variables and SM errors. Source memory is an individual's belief as to how and where a memory came to be (e.g. reading, viewing, or actively participating in an event). All of the participants completed personality measures and viewed a videotaped crime. Then dependent upon their assigned delay condition, participants were exposed to misinformation via a post-event questionnaire. Finally, they completed the SM test. Groups were randomly assigned to one of three delay conditions: (1) immediate group, with no delay (2) split delay group, with a delay between exposure to misinformation and SM test and (3) delay group, with a delay between viewing the event and exposure to the misinformation. In order to explore the relationships between personality and individual performance on the SM test, personality scales (e.g. anxiety, shyness, and curiosity) were administered. Delay is important because previous studies have shown strong effects between delay and the proportion of SM errors, but little attention has been focused on placement of delay. Findings from the study may clear up past inconsistencies and further understanding about the accuracy of eyewitness accounts.

Presenter: McGinniss, Whitney

Research Mentor: Dr. James Cavendish

Title: The Welfare State and Population Health: An Examination of the Role of Social Spending in Improving Population Health and the Mechanism Underlying this Relationship

This study utilizes data from the United Nations, the World Bank, the World Health Organization, and the World Values Survey to examine the relationship between the welfare state and population health among countries of comparable income level. My findings reveal that a 1% increase in social spending is associated with 3 death (per 1,000 live births) decrease in infant mortality rate, an 8 month increase in male life expectancy and a 10 month increase in female life expectancy, net of GDP per capita. Further, this study demonstrates that increased access to water, improved adult literacy, and reductions in income inequality help facilitate this relationship. Measures of social capital, however, were not found to mediate this relationship. The results of this study have important implications for all policy makers who hold improving population health as an important priority.

Recent decades have born witness to an increasing number of studies designed to investigate why health disparities exist between countries with comparable levels of economic development (Chung & Muntaner, 2006; Judge, 1995; Lynch, Davey Smith, Hillemeier, Shaw, Raghunathan, & Kaplan, 2001; Navarro & Shi, 2001; Wilkinson, 1992). Much of this research has focused on the role of income inequality in explaining these differences (see Wilkinson & Pickett, 2006 for review); however, some studies have focused on culture and political history as important predictors of population health (Navarro & Shi, 2001). Recently, several researchers have sought to merge these two lines of study in hopes of developing a more complete understanding of how culture, politics, and inequality come together to influence health outcomes within a given country (Chung & Muntaner, 2006; Coburn, 2000; Lynch, 2000). My study is grounded in research from both of these areas and seeks to further the union of these two orientations.

Presenter: McLaughlin, Keith  
Second Authors: Mikhail Ladanov  
Research Mentor: Dr. Ivan Oleynik  
Title: Shock Compression and the Anomalous Elastic Response in Diamond Single Crystals

The analysis of shock wave propagation through condensed matter is a fascinating area of research with application in scenarios involving extreme temperatures and pressures, such as the detonation of explosives, laser induced shock waves and hypervelocity impacts. Due to the extreme conditions present, traditional experiments are difficult to perform. Instead, we have used first-principles molecular dynamics simulations to investigate the presence of anomalous elastic shock waves in diamond, while also performing analyses of temperatures, pressures and densities at the shock interface.

Presenter: McLeod, James  
Research Mentor: Dr. Lori Collins  
Title: Looking at the Past in 3D: Using Three-Dimensional Technology for Historic Preservation

Yulee Sugar Mill Ruins, located in Citrus County, is a National Register of Historic Places site managed by the Florida Park Service. Existing features of this site include a large chimney with connecting boiler room constructed from native limestone, and sugar processing machinery. These features represent one of Florida's most extraordinary historical settings. The limestone structures and machinery were deteriorating when the Florida Park Service obtained ownership in 1953. In the 1960's attempts were made to stabilize the structures using Portland cement, but environmental factors and the inflexibility of Portland cement caused further deterioration. In 2006 the National Park Service in conjunction with the Florida Park Service began a restoration project which involved removing the Portland cement and re-pointing the masonry with historic lime based mortar. In addition to the stabilization project, detailed maps and three dimensional images were created to assist site managers and researchers. This study evaluates why initial stabilization projects failed and how new technologies can benefit future preservation efforts.

Presenter: Meadows, Jonathan

Research Mentor: Dr. Wayne Westhoff

Title: Assessment of Cardiovascular Disease Occupational Risk Factors of Tampa Latino Populations

Stroke and heart disease is third and the first leading cause of death in Florida (Florida Department of Health, 2003). In current research, Latinos are less probable to adhere to cardiovascular disease (CVD) treatments. Little is understood of how lifestyle and behavior impact CVD (Alcalay et al., 1999). High stress level jobs are correlated to high incidences of CVD (Kivimaki et al., 2006). Lower socio-economical groups are more exposed to high levels of occupational stress (Kristensen et al., 1998) and Latinos are employed in extremely hazardous jobs (Brunette, 2005). This assessment can identify future educational targets that will assist in significant CVD reduction. This study identifies the occupational CVD risk factors in the Metro Tampa Latino population. The survey will collect demographics, occupational information, and anthropological measurements. The analysis will be specifically aimed (1) at determining the occupational health hazard impact on CVD rates, (2) at identifying significant physiological and occupational CVD risk factors, and (3) at increasing the awareness of risk factors that are associated. The dissemination of health education, counseling, and health education class referrals are administered for high occupational risk individuals. Microsoft Access database and SPSS statistical software will be used for data collection and data analysis.

Presenter: Medina, Andre

Second Authors: Kimberly A. Badanich, M.A.

Research Mentor: Dr. Cheryl Kirstein

Title: Characterization of Conditioned Lick Suppression and Fear Extinction in Adolescent Male Sprague Dawley Rats

A large amount of classical conditioning research has been conducted in adult rodents; however, there is limited data in adolescent rats. The purpose of this behavioral study was to determine if fear can be classically conditioned via the conditioned lick suppression paradigm. Adolescent (PND28-42+) male rats were trained to drink sucrose. Once drinking stabilized, rats were randomly divided into 3 groups for the conditioned lick suppression phase: 1) light/shock, 2) shock alone, and 3) light alone where light was the conditioned stimulus and shock was the unconditioned stimulus. Rats exposed to shock (0.5 milliamps) ceased drinking sucrose while the control group (light alone) continued to gradually increase sucrose consumption. At test, sucrose consumption and fear induced freezing behavior (rat being total motionless) in response to the light alone were measured in all groups. Preliminary data suggests that the light/shock group still does not drink at test and on average it takes 7.5 days to extinguish fear of the light in the light/shock and shock alone groups. These data determine how long it takes for fear to be conditioned as well as how long it takes to extinguish fear of a stimulus predicting the onset of fear in adolescent rats.

Presenter: Metroka, Anna  
Research Mentor: Dr. Robert Tykot  
Title: Early Historic Diets in Latin America

My research project is to investigate early historic dietary practices in Latin America using bone chemistry. In particular, testing individuals from the site of Campeche will specifically address the impact of European contact on native American dietary practices. Subsistence patterns are preserved in skeletal remains and are a very important key in unlocking the sociopolitical characteristics and developments of ancient societies.

Maize was an extremely important staple crop in Mexico long before European contact, and it is important to know whether they remained so highly dependent on it afterwards. In order to test the importance of maize and other foods, bone chemistry analysis was performed on 25 individuals from Campeche.

This process used a minute sample of bone which was chemically prepared and analyzed on a stable isotope mass spectrometer. The carbon and nitrogen isotope values produced provide quantitative information on the importance of maize in the diet.

Presenter: Murphy, Christine  
Research Mentor: Dr. KiKi Caruson  
Title: Investigating Executive Misconduct: Contributions from Independent Counsel

In light of the recent I. Lewis “Scooter” Libby investigation and trial, investigating executive misconduct has long been an issue within the United States government. Originally responsible for investigating its own wrongdoings, the executive office has proven the conflict of interests that reside within the system. Born out of the Watergate and Saturday Night Massacre scandals, the independent counsel was a judicially-appointed free agent with broad jurisdiction, and without Attorney General oversight, and therefore without executive office authority, of investigating executive misconduct. Twenty investigations were conducted by independent counsels, and since the legislation expired in 1999, a new breed of special counsels, more similar to their pre-Watergate counterparts than independent counsels, has been created.

Independent counsel legislation expired due to accusations of the counsels possessing too much authority, being too wasteful, and taking long durations of time and large amounts of money to conduct their services. They rarely yielded indictments, much less convictions. There also existed the suspicion of politicization of investigations by Congress. Despite these grievous concerns, was nothing gained by the twenty-year experiment of independent counsels?

Through systematic data collection, I analyze and discuss the universe of cases undertaken by the Office of the Independent Counsel from its conception to its demise. This is an empirical examination of patterns and trends found throughout the twenty investigations. By actualizing the data into a digestible format, I will discuss the criticisms of the independent counsel with its reality. I will also show whether there were any advantages to the independent counsel system that can be implemented into today’s special counsel.

Presenter: Nattkemper, Leigh

Second Authors: Keri Kalmbach<sup>2</sup> James Kotick<sup>1</sup> Mrunal Shah<sup>1</sup>, Alijcia Woronowicz<sup>3</sup>

Research Mentor: Dr. Ronald Mervis

Title: Carboxypeptidase E Increases Dendritic Complexity in 6-Week Old and 14-Week Old Knockout Mice

Carboxypeptidase E (CPE) is involved in the removal of the C terminal basic amino acids in neuroactive peptides, particularly well studied in the biosynthesis of enkephalins. Diminished CPE function has also been shown to cause obesity and infertility in rats. We evaluated randomly selected Golgi stained layer V pyramid cells in 6 week old and 14 week old knock-out mice. Branching analysis of the basilar dendritic arbor of the 14 week old mice revealed a significant increase in dendritic complexity in the knockout mice over the wild-type by Sholl analysis (Wilcoxon Signed Rank test,  $p = 0.0018$ ) and Branch Point Analysis (Unpaired t test,  $p < 0.05$ ). Total hits were increased in the 14 week old knock-out group by 53.2% over wild-type. We saw a similar but reduced effect in the 6 week old mice. When comparing the 14 week old to the 6 week old, the 14 week old wild-type group total hits was reduced by 23.7% below the 6 week old group (Unpaired t test,  $p = 0.0109$ ; Mann Whitney test,  $p = 0.0209$ ). Sholl analysis revealed a dramatic decrease in wild-type 14 week old mice below the wild-type 6 week old in the proximal two-thirds of the tree (Wilcoxon Signed Rank test,  $p = 0.0039$ ). In sum, the absence of carboxypeptidase E increased dendritic complexity in both six week old and 14 week old knockout mice.

Presenter: Nolla, Theresa

Research Mentor: Dr. Rajiv Dubey

Title: Compensatory Motion of Transradial Amputees While Drinking from a Cup

Transradial amputees with a basic prosthesis often compensate for the lack of wrist movement and the ability to pronate and supinate the forearm during activities of daily living (ADL). To quantify this compensatory motion, two amputees and ten control subjects were recorded drinking from a cup as an example of an ADL. Subjects completed the task three times starting and ending with the elbow at 90°. Additionally, the control subjects drank from the cup three times with their arm immobilized by a brace, simulating a transradial prosthesis. While completing the task, nineteen reflective markers were placed on the subjects' arms and torso and each trial was captured by a Vicon Motion Analysis System. Subjects were represented by an average of their three trials. Joint centers were determined and the maximum shoulder flexion, shoulder abduction and elbow flexion were calculated. Compared to the control subjects, the maximum shoulder flexion and abduction increased in the braced subjects and in the amputees while maximum elbow flexion decreased in the amputees and in the braced subjects. Future research may include more amputees, additional tasks and calculating joint torque.

Presenter: Patel, Hershel  
Second Authors: Miranda L. Cheney  
Research Mentor: Dr. Mike Zaworotko  
Title: Co-Crystal Controlled Solid-State Synthesis of Novel Schiff Bases

Co-crystals can be defined as two or more molecules that are solids under ambient conditions that are sustained via a supramolecular synthon. A Cambridge Structural Database survey of this class of compound shows that only 0.5% of known crystals are truly co-crystals. While the use of co-crystals in the pharmaceutical sciences is ever increasing, their employment in solid-state synthesis can have a significant impact in the pharmaceutical industry as well as in green chemistry. Co-crystals may act as precursors to a number of solid state reactions, in particular the condensation reaction incorporating a primary amine and an aldehyde to ultimately form a Schiff base. These two types of co-crystal formers will be ground together in the presence of small amounts of various solvents. The ground material will be studied to verify the formation of a co-crystal. After these co-crystals have been generated they can be heated to ultimately form a Schiff base. These novel materials have many practical uses such as enhancing the aroma or taste of consumable materials such as foodstuffs and medicinal products.

Presenter: Paulk, Monique  
Research Mentor: Dr. David Drobos  
Title: Alcohol and Smoking Cross-Priming Effects: A Stroop Task Study

Research concerning the dual usage of alcohol and tobacco is crucial for improving treatment outcomes among alcoholic smokers, and developing a more general understanding of the factors involved in alcohol and tobacco use at various levels of usage. Research has demonstrated that drug-dependent individuals react strongly to cues associated with past or current drug administration. The question addressed in the proposed study is, does drug-specific priming of target words cause attentional bias? Secondly, are there cross-priming effects on target words for those who are heavy smokers and drinkers? We will use the modified Stroop test to measure reaction time to alcohol and smoking words and determine if these responses are influenced by substance-related priming cues. The study is a 3 X 3 factorial, within-subjects design. There will be 45 participants who range from light to heavy smokers and drinkers. We predict there will be drug-specific priming effects on attentional bias. Furthermore, we predict there will be cross-priming effects on attentional bias of participants who smoke and drink.

Presenter: Persad-Maharaj, Narin

Research Mentor: Dr. Sean Barbeau

Title: Automated Trip Purpose Detection for Individual Travel Behavior

In recent years, research into automatic traffic data collection with GPS technology has shown promising feasibility for replacing traditional resources of traffic data. Paper diaries and phone interviews are two such resources that are widely depended upon by the traffic and travel research industry. Among its other functions, one of the most consequential uses of travel diaries has been to report an individual's purpose for travel. Recent studies compared vehicle-based GPS data to manually recorded data in Travel Diaries to evaluate the efficiency of automated travel purpose derivation systems. This study is concerned with the development of an automated Purpose Detection Algorithm that utilizes GPS Data collected by GPS-enabled mobile phones. The collected GPS data is used in a GIS map to obtain various spatial and location characteristics which are then used by the Purpose Detection Algorithm to derive a traveler's trip purpose. Preliminary tests conducted compared the results of the Purpose Detection algorithm to various travel diaries. The results showed that the Purpose Detection Algorithm surpassed the dependability and efficiency of human memory in several areas. Even more significant, the results demonstrate the potential to replace human memory as a relied upon source of traffic data.

Presenter: Prosen, Katherine

Research Mentor: Dr. My-Lien Dao

Title: Detection of Escherichia Coli O 157:H7 in Foodstuffs by Modified ELISA Method Using Antibody and Phage Display

It has become increasingly apparent from the advent of recent epidemics caused by the contamination of spinach and lettuce, as well as the possibility of terrorist attacks, that a rapid, sensitive, and specific method of identification of Escherichia coli O157:H7, and other pathogens, is needed. The minimum infective dose of E. coli O157:H7 is believed to be ten cells. A modified ELISA was shown to detect as few as one E. coli O157:H7 in PBS per well (Dao Laboratory, USF, Tampa, FL - Patent Pending). It is believed that this method can be adapted to the detection of contamination of various foodstuffs, particularly skim milk and apple cider, both of which present unique difficulties for assays. Furthermore, the efficacy of a phage display library as a replacement of goat anti-E. coli O157:H7 polyclonal antibody will be investigated, as these have been shown to be more hardy and specific than antibodies.

Presenter: Quasem, Ishtiaque

Second Authors: Kevin Nehaul<sup>2</sup>, James Kotick<sup>2</sup>, Amanda Cupples<sup>2</sup>, Keri Kalmbach<sup>3</sup>, Adam Bachstetter<sup>4</sup>, Sun Shim<sup>5</sup>

Research Mentor: Dr. Ronald Mervis

Title: The Effect of Lithium Chloride on Dendritic Parameters in Adult Rats

Lithium may serve as a treatment for bipolar disorders and other psychiatric conditions by counteracting both mania and depression. Lithium affects neurotransmitter activity by increasing serotonin levels and decreasing noradrenaline discharge. It is thought that lithium may also alter dendritic parameters such as branching and spines that are the underlying neurostructural basis for cognitive function. Here, we evaluated the morphology of Golgi stained granule cells of the dentate gyrus. Adult rats were injected with lithium chloride (1mEq/kg/day IP injection for 14 days) or saline. Lithium treatment resulted in a remodeling of the dendritic arbor of the granule cells: there was a significant dichotomous effect on both proximal and distal portions of the dendritic arbor. There was increased branching in the proximal region on lithium induced rats when compared to the control. Conversely, there was decreased branching in the distal portions when compared to the wild type. Previous studies have indicated that neurophysiological changes in dentate gyrus occur in lithium treated rats. While the mechanism is poorly understood at this time, it is possible that these morphometric changes influenced the physiological characteristics. Additional ongoing studies are evaluating and contrasting acute vs chronic treatments.

Presenter: Quecan, Andrew

Research Mentor: Dr. Susan MacManus

Title: Minority Path-Breakers in State Elected Offices

Florida is one of the nation's most racially/ethnically diverse states. Yet little research has been done of minorities elected to state executive, legislative, and judicial posts. This paper identifies the "first" racial/ethnic minorities by party and gender to win election to these positions. This paper will also identify past and recent voting and demographic trends amongst minority voters. Biographical, historical, and interview data are used to gain insights and develop theories into electoral risk-taking by African American, Haitian, Hispanic (Cuban, Puerto Rican, Mexica, Colombia) and Asian candidates or "path-breakers" who were the "first" to be elected to state executive, legislative, and judicial positions in Florida.

Presenter: Ramsey, Lynn

Research Mentor: Dr Suzanne Stein

Title: Thomas Chatterton: The Prototypical Romantic Poet

This essay explores the influence and legacy of Thomas Chatterton, the eighteenth century English poet, satirist, and forger who, like so many that die young, gained notoriety after his untimely suicide at the age of seventeen. Despite the paucity of his meteoric life, he was an important link between the Augustan period and the Romantic Movement, heralding and influencing many of Romantic poets, including Coleridge, Keats, and later, Tennyson. The essay explores the idea of Chatterton as a motif of the Romantic period, a cause célèbre whose qualitative contribution to the body of English literature has generally been overlooked, trumped by his notorious medieval forgeries. The success he achieved in duping the greatest literary minds of the eighteenth century, including Samuel Johnson, if just for a moment, attests to Chatterton's prodigious talents, and remains a literary enigma that mystifies scholars to this day.

Presenter: Reid, Ralph

Research Mentor: Dr. Susan MacManus

Title: Gender and the Florida Judiciary: Who Runs, Who Wins, and Why?

There are many eligible female candidates for the Florida judiciary, but fewer women than men choose to run, leaving Florida judgeships dominated by males. It is ostensible that women are as likely as men to be elected to these judgeships, but very little research has been done into determining the effect gender has on judicial candidates' successes.

In this study, a comparative analysis is made between the number of men and women who ran for judicial office in 2006 and their electoral success. The contributions of factors like incumbency are also analyzed. This information is examined statewide, and at each major court level in Florida: Supreme, Appeals, Circuit, and County. This study aims to determine whether men or women are statistically more likely to win judicial elections and why this is so. This is significant because the number of eligible female candidates continues to grow. Understanding whether gender has an effect on their election and the impact of incumbency can help determine why so few women run. Election data were computed from various databases obtained from the Florida Department of State, Division of Elections (<http://election.dos.state.fl.us/>), from the various county supervisors of elections websites, and from personal interviews with judicial candidates.

Presenter: Reusch, Meghan

Research Mentor: Dr. Thomas Guadagno

Title: Characterization of the Cellular Effects Induced by PLX4718: A Novel B-Raf Inhibitor for Treating Melanoma

B-Raf is a protein kinase involved in the mitogen activated protein kinase pathway (MAPK). This pathway regulates cell proliferation, cell cycle progression, and cell survival. The B-Raf gene has been found to have activating mutations in many types of cancers, including 66% of melanomas, leading to hyperactivation of the MAPK pathway. Of these activating mutations, nearly 90% result in an amino acid change from a valine to a glutamate at residue 600 (V600E). PLX4718 is a new inhibitor of B-Raf, that preferentially inactivates the V600E mutated form. By specifically targeting the V600E mutated form of B-Raf, PLX4718 could potentially be very useful as a chemotherapeutic agent, since it would not effectively target a patient's normal, healthy cells. I have tested this inhibitor on melanoma cell lines which have the V600E B-Raf mutation. The results show that a G1/G0 cell cycle arrest occurs in cells when treated with PLX4718. This arrest has been confirmed by looking at several markers of the cell cycle. Currently, the PLX4718 inhibitor is being tested in combination with the microtubule poison Paclitaxel, determine whether synergistic effects occur, resulting in greater cell death than occurs with either drug when used alone.

Presenter: Rodriguez, Jael

Research Mentor: Dr. Mark Jaroszeski

Title: Modulation of IRE-1 Signaling in the Adaptive Unfolded Protein Response

The Unfolded Protein Response (UPR) is an adaptive mechanism important for resolving endoplasmic reticulum (ER) stress, due to the accumulation of misfolded proteins within the ER lumen. The kinase IRE-1 is a major component of this signaling pathway, participating in the alternative splicing of XBP-1, among other transcriptional and translational changes. In cells of the immune system, there are a variety of stimuli that induce ER stress during situations of high protein production. Signaling from Toll-Like Receptors (TLRs), which help detect bacterial and viral infection, has been shown to induce ER stress, which results in increased cytokine production. The goal of this project was to study the synergy between ER stress and TLR-4 signaling on IL-6 production in macrophages. Using this approach, confirmation of the synergistic production of IL-6 under optimized applications of Tunicamycin and Lipopolysaccharide to RAW264.7 macrophage cells was achieved. In addition, the successful design of a 96-well screening assay for the testing of small-molecule inhibitors of IRE-1 was achieved.

The significance of this research is the future characterization of TLR-4 and UPR synergy, resulting in a better understanding of ER stress and TLR receptor signaling during innate immune response.

Presenter: Rogers, Elizabeth

Research Mentor: Dr. Jamie Goldenberg

Title: Grading on the Curves: Measuring Body Ideals as a Function of Model's Ethnicity

In the study of body image, there has been a great deal of focus on the differences between ethnicities- how they feel about their bodies, how their bodies effect their sense of self, etc, and how these differences may in turn effect eating pathology and overall self esteem. The main hypothesis of this study that the perception of a model's body (as fat, tin, or ideal) is moderated by her ethnicity. Participants rate a series of models that were created so there are 2 for each of the 12 gradients of the body mass index used. One of the two is Caucasian, the other is African American. After the participant evaluates each of the figures singularly, he/ she will be given the Eating Disorder Inventory (Body Dissatisfaction Scale), the Multigroup Ethnic Identity Measure, and the Multidimensional Body-Self Relations Questionnaire. After the data is collected, a T-test, ANOVA and regression analysis will be conducted to find correlations. These results are expected to find a disparity in the ratings, pointing to a stricter standard of thinness held by society as a whole for Caucasians in comparison to African Americans, thus giving reason for their higher levels of body dissatisfaction and eating disorders.

Presenter: Safa, Maria Dalal

Research Mentor: Dr. Judith Bryant

Title: Language and the Bicultural Self

Research on acculturation and ethnic identity suggests that individuals may successfully identify with multiple cultures. Furthermore, the changing demographics in the United States suggest that the number of individuals who have internalized more than one culture is substantial and increasing constantly. Biculturalism may relate to psychological well-being, coping skills, organization of knowledge, and identity development. The present research will investigate how bicultural identities operate at an implicit or unconscious level. Using the Implicit Association Test, I will explore how linguistic context influences identification among bicultural individuals. Specifically, this research will examine the extent to which bicultural Hispanic/Latino-American individuals identify with American and Hispanic/Latino culture as a function of whether they complete the study in English or Spanish. A minimum of 60 bicultural Hispanic/Latino students will be asked to use a computer to categorize, as quickly as possible, words related to the concept of "American" or "Hispanic/Latino" identity (e.g., autonomous, cariñoso) and to the concepts "me" or "not me" (e.g., I, ellos) in either English or Spanish. They will also be given questionnaires on background, bilingualism, and ethnic and cultural identification. This study aims to understand the extent to which the use of different languages may influence bicultural individuals' self-concepts.

Presenter: Schmidlin, Elizabeth

Research Mentor: Dr. Kimberly O'Brien

Title: Diversity Climate, Justice, and Organizational Models

The current study investigates the role of diversity climate and justice on organizational behaviors. Data from 81 employees shows that the effect of diversity climate on turnover intentions, organizational commitment, and organizational support is mediated by justice. It is believed that diversity mindedness will lead to certain organizational outcomes – specifically OCB, CWB, task performance, turnover, satisfaction, organizational commitment and organizational support. All of these constructs have been studied extensively in the past, but it is their relationship to diversity mindedness that will be explored. It is further believed that the relationship between diversity mindedness and these constructs will be mediated by organizational justice.

Presenter: Seedial, Stephen

Second Authors: P.R. Sanberg, T. Desjarlais, O. Kuzmenok, C. D. Sanberg

Research Mentor: S. Garbuzova-Davis

Title: Dose Effects of Intravenously Transplanted Human Umbilical Cord Blood Cells in Proliferation of Splenic Cells in a Mouse Model of ALS

Amyotrophic Lateral Sclerosis (ALS) is a degenerative disease of multifactorial origin, characterized by motor neuron loss in the brain and spinal cord. Previously, Garbuzova-Davis et al. (2003) showed single intravenous (iv) injection of  $1 \times 10^6$  mononuclear-human umbilical cord blood (MNC-hUCB) cells delayed disease progression 2-3 weeks in G93A mice modeling ALS. Most grafted cells “homed” to the spleen. This study investigated the dose response effect of iv delivered MNC-hUCB cells upon splenic cell proliferation in G93A mice. Survival rates and condition of the motor neurons were also determined. Three doses of MNC-hUCB cells,  $10 \times 10^6$ ,  $25 \times 10^6$  and  $50 \times 10^6$ , were administered iv into pre-symptomatic (7-8 weeks) G93A mice. Three control groups were used: G93A mice injected with media, G93A mice receiving daily CsA, and wild-type C57BL/6 mice. Proliferation of mouse splenic cells and MNC-hUCB cells in the spleen was measured using BrdU incorporation. Proliferation activity of splenocytes was determined by stimulation with the mitogen, phytohemagglutinin (PHA), in vitro. The mice receiving  $25 \times 10^6$  cells had significantly increased lifespan, more surviving motor neurons and the highest number of proliferating splenic cells as measured by BrdU incorporation and PHA stimulation. The highest cell dose was unexpectedly ineffective and may have elicited some type of immune “conflict” between introduced and host cells. These results demonstrate that treatment with an appropriate dose of MNC-hUCB cells may provide a neuroprotective effect and may have therapeutic potential in the treatment of ALS. Supported by: NIH STTR grant IR41NS46870-01A1; Saneron CCEL Therapeutics, Inc. (Tampa, FL). Conflict of Interest: SGD and OK are consultants and PRS is a co-founder of Saneron CCEL Therapeutics, Inc.

Presenter: Shah, Mrunal

Second Authors: Kalmbach, Keri

Research Mentor: Dr. Ronald Mervis

Title: Neuronal Dendritic Alterations in the Frontal Cortex of Brains of Individuals Characterized as Normal Aging, Alzheimer's Disease or Mild Cognitive Impairment: A Preliminary Assessment

Synaptic damage and loss are factors that affect the degree of dementia experienced in Alzheimer disease (AD) patients. Mild Cognitive Impairment (MCI) is regarded as a preclinical stage of AD. Autopsied tissue from multiple brain regions was obtained from the Nun study (University of Kentucky), and the Religious Orders Study (Rush Medical Center, Chicago). Tissue was from cognitively-assessed subjects with a relatively uniform life style in terms of education, diet, and environment. Dendritic branching and spine alterations may be related to cognitive changes. For this initial evaluation, formalin-fixed tissue blocks from the frontal cortex of normally aging (N=4) , MCI (N=2) , and AD (N=2)] were Golgi-stained. Six randomly selected layer II-III pyramids were quantified from each brain and data represents the initial phase of a larger on-going study. In the frontal cortex neurons from the AD brains showed no significant loss of branching compared to controls. Indeed, the AD neurons had more complex dendritic arbors. In contrast, the MCI neurons had less dendritic material than the controls or the AD brains. However, dendritic spines on the neurons from MCI brains were significantly greater than controls. This may represent a compensatory response to branch atrophy in the MCI brains. Neurons from the Parietal cortex that has been shown to exhibit more disease pathology than other regions, showed the same arborization pattern with significantly greater differences between groups (P= 0.0001). Findings could represent some of the earliest manifestations of dysfunctional circuitry

Presenter: Shiwmandal, Rajiv

Research Mentor: Dr. Ellen Verdel

Title: Identifying Africanized Honey Bees Specific Proteins and their Use for Developing a Commercially Viable Field Assay

Africanized Honey Bees (*Apis mellifera scutellata*) (AHB), pose a significant threat to the agricultural industry here in the United States. Africanized honey bees are inferior to European honey bees as commercial pollinators. The presence of Africanized bees in commercial hives significantly reduces their value to the agricultural industry. The purpose of this research is to provide a cost-effective, efficient and timely method to differentiate between the European and Africanized honey bees in the field.

Using two-dimensional gel electrophoresis three AHB specific proteins were discovered, each one termed A-1, A-2, and B-1 proteins AHB specific proteins identified and separated by isoelectric focusing (IEF) provides a gateway for creating monoclonal antibodies (mAb). Monoclonal antibodies are antibodies that specifically bind to a particular substance which can then serve to detect or purify AHB specific proteins.

A fourth protein termed B-2 was found to be present in all European honey bees.<sup>1</sup> The B-2 was found to be structurally related to the A-1, A-2, and B-1 proteins. In order to confirm specificity of the three proteins to Africanized bees, narrow range isoelectric focusing was used to examine a broad variety of AHB and European honey bee populations. These proteins have not been observed in any of the European honey bee populations while the AHB exhibit a variety of the three.

Approximately 7 % of individual Africanized bees examined lack any one of the three AHB specific proteins while 93 % possess at least one of them.<sup>1</sup>

It was important to distinguish that the A-1, A-2, and B-1 proteins observed were single unique proteins as this information helps characterize specific differences between the two bee species. Even though the confidence level is only 93%, if one individual bee is analyzed, this level can be raised considerably if a small number of individuals from the same swarm are analyzed.<sup>1</sup> Several mAbs specific to AHB specific proteins haven been produced using AHBs found in Texas and Mexico. We have a lab assay based on these AHBs. We are now testing the assay with Florida AHBs and working on converting the lab technique ELISA to a strip assay.

Presenter: Silvers, Deborah

Research Mentor: Dr. Silvio Gaggi

Title: An Analysis and Comparison of A Midsummer Night's Dream and Las Meninas

William Shakespeare and Diego Velasquez, both masters of their respective arts, explored the use of meta elements in the titled works.

Shakespeare, in A Midsummer Night's Dream, constructed a plot wherein the audience watching the play joins the audience in the play. Like a person staring in a mirror, the audience sees their reflection onstage. As the audience outside the play joins the audience inside the play, Shakespeare blurs the line between reality and fantasy in both the construct of the audience and the wedding guests in the play.

Diego Velasquez, in Las Meninas, constructed an informal scene featuring the Infanta and her maids, along with a self-portrait of the artist at work in the familial setting. The reflection of the King and Queen of Spain in the mirror directly across the room leads the audience to question their own perspective, not only in relation to the portrait, but as to the actual subject of Velasquez' painting.

Each of these artists were celebrated as artists in their own lifetimes, used their mediums to show new ways of engaging their audience while making a social commentary on the manner in which artists of that time were viewed.

Presenter: Sponaugle, Ashley

Second Authors: Kimberly A. Badanich, M.A

Research Mentor: Dr. Cheryl Kirstein

Title: Stereotaxic Localization of the Developing Ventral Tegmental Area

The ventral tegmental area (VTA) is one brain region that has been implicated to play a role in mediating addiction; however, little research has been conducted on the anatomy of the VTA in adolescents. Understanding the development of this brain region plays a critical role in understanding adolescent substance abuse and its implications on behavior and neurophysiology.

The purpose of the study was to locate the VTA in adolescent rats. Early adolescent, mid-adolescent, or adult male rats were surgically implanted with a guide cannula aimed at the VTA. Adult coordinates, (P: -3.5, L: + 1.0, V: -8.5 from bregma) were used as a baseline for localization of VTA coordinates for early and mid-adolescent rats. After 12 days of recovery, brains were removed, sliced, and stained for histological verification of cannula placement in the VTA. Preliminary results suggest VTA coordinates in adolescents differ from adult rats. Results show that the brain is still developing during adolescence and implies that growth and development of the brain may induce functionality differences between adolescents and adults. Therefore it is imperative to consider anatomical differences in the VTA when comparing the effects of substance abuse and addiction on behavior and neurophysiology between adolescents and adults.

Presenter: Staley, Christopher

Research Mentor: Dr. Valerie Harwood

Title: Analysis of *Vibrio Vulnificus* Strain Distribution among Oyster Tissues and Identification of Potential Virulence Markers Using BOX-PCR

*Vibrio vulnificus* bacterial concentrations (9) and strain diversity (5) are frequently high in oyster tissues making it a leading cause of food-borne illness. Analysis of 16S rRNA has distinguished between environmentally-associated (A) and clinically-associated (B) strains (13). The ability of BOX-PCR to assay concentrations of *V. vulnificus* as well as strain distribution and diversity among fresh and industrially treated oyster tissues was evaluated. Identification of *V. vulnificus* species with BOX-PCR in environmental samples was limited, but determination of A/B types of confirmed *V. vulnificus* strains showed good agreement with standard methods. In all tissues and treatments, type A strains composed approximately 80% of the *V. vulnificus* population, which showed extremely diversity. Post-harvest treatment was shown to significantly reduce *V. vulnificus* concentrations without affecting the A:B ratios. The 1.1kb band used in BOX-PCR to identify these clinically-associated strains may serve as a virulence marker for these isolates.

Presenter: Stephens, Daniel

Research Mentor: Dr. Lori Collins

Title: Using Global Positioning Systems for Cultural Resource Protection Strategies: A Case Study in Manatee County, Florida

Shaw's Point (8Ma07) is 28 acres of land located at the mouth of the Manatee River in South Florida. This National Landmark site was a focal point of pre-historic Native American habitation in the area and is a possible location of Sixteenth century European contact in Florida. Although managed by the National Park Service, Shaw's Point faces many threats including illegal artifact collecting, shoreline erosion, developmental pressures, and erosion of the shell mounds and midden areas that comprise the site. Using Global Positioning Systems (GPS), I will collect site-specific information used to create a Geographical Information System (GIS) database. This data will be used in future archaeological research investigation, and will provide baseline management information to help reduce erosion and stabilize shoreline areas. Studies will be focused on documenting locations of archaeological sensitivity, including areas known to contain unmarked human remains, areas of looting or vandalism, erosion impacts, and locating areas where invasive exotic vegetation occurs. This location data will assist in park management, and will allow cultural resources to be considered in natural resource planning.

Presenter: Syed, Salahuddin

Research Mentor: Dr. Kristina Schmidt

Title: Role of CTF4 in Maintaining Genome Stability in the Yeast *Saccharomyces Cerevisiae*

Ctf4 of *Saccharomyces cerevisiae* is a chromatin-associated protein that is involved in sister chromatid cohesion. Ctf4 has been described as being a part of the replisome and has high affinity for DNA polymerase  $\alpha$ . Lack of Ctf4 causes defects in sister chromatid cohesion that may result in pre-anaphase arrest.  $\alpha$  ctf4 mutants that lack the homologous recombination protein Rad52 are slow growing due to frequent cell death, further supporting a role of Ctf4 in DNA metabolism. Here we explore the effect of the  $\alpha$  ctf4 mutation on the spontaneous formation of gross chromosomal rearrangements (GCRs) in yeast. Using an assay that measures the rate of simultaneous loss of two counterselectable markers, CAN1 and URA3, in a non-essential region on the left arm of chromosome V, we show that  $\alpha$  ctf4 mutants have a moderately increased GCR rate ( $1.562 \times 10^{-9}$ ) compared to wild type cells ( $3.5 \times 10^{-10}$ ). GCR types commonly isolated from mutants with defects in DNA metabolic pathways include de novo telomere additions, translocations, interstitial deletions and chromosome fusions. To gain insight into the types of GCRs formed in the absence of Ctf4 we have isolated  $\alpha$  ctf4 clones with GCRs and mapped their chromosome V breakpoints by PCR. Efforts to amplify and sequence the breakpoint junctions and thus identify pathways involved in healing DNA breaks in  $\alpha$  ctf4 mutants are underway. To gain further insight into the role of sister-chromatid cohesion in the maintenance of genome integrity, we have expanded this investigation to determine the effect of mutations in the DNA damage checkpoint sensor Mec3, and the DNA helicase Sgs1, which are known to play important roles in maintaining genome stability, on GCR formation in cells that lack Ctf4.

Presenter: Thompson, Camille

Research Mentor: Dr. Victoria Panzer

Title: Renew New Orleans

Competition will always be a factor for New Orleans, and after Hurricane Katrina it has become harder for New Orleans to overcome the competition. They must distinguish themselves and show their uniqueness against other destinations. Much research has been done on technology and how it affects the lives of almost everyone in America. More people are making their vacation plans online, and more than that are using the web for research. This will become an important factor for the city of New Orleans to take advantage of.

Although the city suffered a tremendous loss after the storm, they are rebuilding quite quickly. The best way to get people to think of this destination as a top place to visit on vacation is to show the consumer that New Orleans has strong culture and heritage that is brought out through music, food, and art, to accentuate the city as a fun, relaxed, celebration atmosphere that is safe, friendly, and satisfying compared to other cities towards the target demographic, and to emphasize progress made in the rebuilding process of New Orleans.

All of these goals can be achieved through our programs, which will put New Orleans back on the map. The promotions include advertising on TV, the internet, and magazines. There are also vacation packages, event sponsorships, and brochures that will ensure that the goals are met.

Presenter: Tomlinson, Jennifer

Research Mentor: Dr. Annette Cozzi

Title: Anger Lickin' Good: An Analytical Investigation into the Urban Diet

There is a distinction between the diet of residents in urban areas and suburban areas. In my paper, I seek to identify these distinctions by revealing how the diet of urban areas is in direct relationship to the economics of the region. I also seek to demonstrate how food can be used as a distinguisher in defining social classes. These examples can be observed in different food related occurrences in urban culture such as the location of fast food restaurants, the lack of self-owned urban markets and government assistant programs.

Presenter: Verdaasdonk, Jolien

Research Mentor: Dr. E. Christian Wells

Title: Assessing Pre-Hispanic Agricultural Potential and Its Implications for Political Development in Northwest Honduras

This paper examines the degree to which agricultural surplus correlates with political power in prehispanic farming communities in northwest Honduras. Attributes of soil fertility measured on mollic epipedons in the Palmarejo region, including soil pH, texture, structure, consistency, and PNK levels, are compared to determine which soils are more or less suitable for maize cultivation. These fertility measures, combined with parcel size and distribution, are then used to infer agricultural potential for different settlement zones. The results reveal a complex mosaic of soilscaapes variably suited for agriculture, with the largest settlement, Palmarejo, occupying some of the most productive plots.

Presenter: Walker, David  
Research Mentor: Dr. Vinay Gupta  
Title: Fabrication of Inorganic Oxide Coated Gold

The functional properties of rod-shaped gold nanoparticles can be tailored for specific applications in sensors and catalysis by combining the gold nanorods (GNRs) with inorganic oxides such as silicon dioxide (SiO<sub>2</sub>) or titanium dioxide (TiO<sub>2</sub>). Towards this end, coating of GNRs with SiO<sub>2</sub> has been performed by direct hydrolysis of tetraethylorthosilicate (TEOS) in aqueous solutions. While UV spectroscopy indicated that a coating of SiO<sub>2</sub> on the GNRs was achieved, transmission electron microscopy showed the presence of large aggregates. To circumvent the aggregation of the composites and also to facilitate coating of TiO<sub>2</sub> in ethanolic solutions, a second approach where GNRs are first modified with various polyelectrolytes by a layer-by-layer (LBL) technique has been investigated. The polyelectrolyte layers stabilize the GNRs during re-dispersion in ethanol and allow partial shielding of the surface charge of the gold nanorods. The presentation will focus on the synthesis of GNRs, the LBL polyelectrolyte coating technique, and the coating of inorganic oxides by hydrolysis of their pre-cursors. Supporting characterization of the composites using spectroscopy (UV), transmission electron microscopy (TEM) and dynamic light scattering (DLS) will also be presented.

Presenter: Watson, William  
Research Mentor: Dr. Darlene DeMarie  
Title: Three to Five-Year Old Children's Photographs of Preschool

How can we discover what aspects of an event young children think are important? Older children are more skilled than younger ones in using words to communicate thoughts (Miller, 1993). Thus, verbal interviews have limitations when used alone in research methodology. Although verbal interviews can yield much information, the role of the researcher is never totally detached from meaning-making in this method.

According to Ziller (1990), autophotography gets around these obstacles. Autophotography means that the participant is given a camera and takes any photographs he/she chooses to take to answer a question. Thus, he/she has shared control with the researcher.

A study using autophotography with 3- to 12-year-olds on a field trip to the zoo showed that the youngest children focused on different aspects of the zoo than older children. Using verbal interviews and autophotography DeMarie and Foyle (2007) found that, among elementary school children, those who took more photographs of people (friends and/or teachers) were more successful in school.

The present study used autophotography with children at a local preschool to determine what they thought was important about it. Results will shed light on various aspects of the preschool experience as seen through the eyes of preschoolers.

*This project was made possible by a research grant from the USF Office of Undergraduate Research.*

Presenter: Watts, Nathan

Second Authors: Kim H. T. Paraiso

Research Mentor: Dr. William Kerr

Title: SHIP is required for KIR Expression by Natural Killer Cells

Natural Killer (NK) cells attack other cells in the body that lack or have reduced expression of Major Histocompatibility (MHC) antigens on their surface. This is a critical “fail-safe” mechanism in the immune system since virally-infected cells and some tumors down-regulate host MHC to avoid immune surveillance by T cells. We have previously shown that the full expression of murine NK receptors for MHC requires the SH2-containing Inositol Phosphatase (SHIP) gene. We then explored whether SHIP is also required for normal expression of human NK receptors for MHC antigens. These human NK receptors are called KIR. KIR exist as a multi-gene family located in a single chromosomal locus. A KIR locus transgene consisting of 10 different human KIR genes was introduced into the germline of mice and then crossed onto SHIP<sup>-/-</sup> or WT backgrounds. The relative levels of KIR expression in SHIP<sup>-/-</sup> and WT NK cells was then compared by flow cytometry. Our preliminary results indicate SHIP deficiency causes significantly reduced expression of KIR by SHIP<sup>-/-</sup> NK cells relative to WT controls ( $p < 0.05$ ). This finding suggests SHIP’s function in regulating NK receptors for MHC may be conserved in rodents and Homo sapiens. Surprisingly, we find that the KIR locus transgene is present at a substantially lower frequency in weaned SHIP<sup>-/-</sup> mice ( $p < 0.001$ ). We speculate that the presence of the human KIR locus compromises the ability of murine SHIP<sup>-/-</sup> NK cells to remain tolerant of normal “self” causing KIR+SHIP<sup>-/-</sup> mice succumb in utero or post-natally. Testing of this hypothesis and additional analysis of KIR expression in SHIP<sup>-/-</sup> NK cells will be performed to further understand the role that SHIP plays in KIR expression and NK biology.

Presenter: Whalen, Sharon  
Research Mentor: Dr. Tony Tan  
Title: Children's Racial Awareness and Preference

The pilot study investigated children's racial awareness and racial preference. Literature suggests that children as young as three years old are capable of identifying dolls who resemble themselves racially. Some researchers have suggested that African-American children show a preference towards Caucasian dolls when asked which dolls they would play with. However, little is known whether children with mixed heritage are also capable of such a developmental task, which is the importance of this study. In the study, three groups of children were interviewed with three male dolls and three female dolls. Each group included three boys and three girls of the same racial background (i.e., African-American, Caucasian and Bi-Racial; children of African-American & Caucasian decent). All the children were three years old. The dolls represented an African-American, Caucasian, and Bi-Racial figure respectively. Each child was asked 1) "Which doll looks the most like you?" 2) "Which doll looks the most like your mom?" and 3) "Which doll looks the most like your dad?". Additional questions about the child's friends were also asked. Results from the study showed that all children succeeded in gender identification. That is, they were able to correctly identify a doll that had the same gender with themselves and their parents. However, only half of the children correctly identified the dolls that corresponded to their own ethnic backgrounds. Only one-third of the children correctly identified the dolls that corresponded to the ethnic backgrounds of their caregivers. Children from a Bi-Racial background were similar to African-American and Caucasian children in racial awareness. The Bi-Racial and African-American children did not show a preference towards the white dolls as playmates. No gender difference was detected either. Implications and limitations of the study will be discussed further.

Presenter: Wheeler, Kristen  
Research Mentor: Dr. Bill Baker  
Title: Curiosity Killed the Sponge: The Isolation and Structural Elucidation of an Alkyl Glyceryl Ether with Antibiotic Cytotoxicity to *Staphylococcus Aureus* in an Undescribed Antarctic Sponge

Investigation into an undescribed Antarctic sponge has led to the isolation of an alkyl glyceryl ether. Alkyl glyceryl ethers are found widespread in nature and exhibit a number of physiological properties. 3-Henicosyloxy-1,2-propanol was isolated by bioactivity-guided fractionation. The structures were elucidated by spectroscopic analysis including 1D and 2D NMR ( $^1\text{H}$ , and  $^{13}\text{C}$ , COSY, HMBC, HSQC). The purified compound (1.3  $\mu\text{g/ml}$ ) showed antibiotic cytotoxicity against *Staphylococcus aureus* (ZOI=7mm).

Presenter: Wolvin, Vanessa  
Second Authors: Lauren M. Bylsma  
Research Mentor: Dr. Jonathan Rottenberg  
Title: Personality and Post-Crying Catharsis

For many individuals tearful crying appears to relieve distress and be soothing, but empirical research designed to understand the cathartic effect of crying has been limited. Researchers have theorized that there is a particular subgroup of people who experience positive feelings and relief after crying behavior, but why this subgroup benefits from crying is poorly understood. This study investigated personality variables and disposition to crying in order to clarify why some people report relief after crying while others do not. Personality and crying data was obtained through questionnaires (including the Eysenck Personality Questionnaire, the Bermond-Vorst Alexithymia Questionnaire, and the Adult Crying Inventory) administered to a female sample (N=153) in the Netherlands (average age=44). It was hypothesized that personality traits such as neuroticism and extraversion would be related to cathartic crying. In addition to experiencing catharsis, it was predicted that participants displaying these traits would show a greater tendency to cry. Alexithymia (difficulty expressing or experiencing emotion) was hypothesized to be negatively correlated to both of these factors. Furthermore, we hypothesized that people with a greater tendency to cry would also be more likely to benefit from crying. The majority of the sample reported that they generally experience cathartic effects of crying, including feeling more relaxed, more relieved, less tense, and less sad or depressed after crying. Neuroticism was found to both be positively related to crying tendency and frequency. However, contrary to hypotheses, neuroticism and extraversion were unrelated to catharsis. As predicted, low alexithymia scores were positively correlated with catharsis, indicating that people better at expressing and understanding their emotions were more likely to experience catharsis after crying. Crying tendency was found to have a significant positive correlation to feeling more relaxed after crying. This research provides preliminary evidence that personality factors may account for why some people experience catharsis after crying. Future research should examine whether these results are applicable to male populations, and investigate other personality traits that may be influential to catharsis.

Presenter: Yagoda, Rosemarie  
Second Authors: Dr. Jennifer Burke, Dr. Robin Murphy  
Research Mentor: Dr. Michael Coovert  
Title: Development of a Modeling Approach for Human-Robotic Interaction

The purpose of this study is to develop a methodology to capture human-robot interaction. After specifying the problem area within the operation of Unmanned Aerial Vehicles (UAV), the approach reflects an integration of Job Analysis, Cognitive Work Analysis, and Petri nets. Figure 1 presents this graphically. Our approach is applied to human-robot operators focusing on search and rescue tasks. The job is one in which three individuals are involved in a search and rescue task and jointly operate a MAV (Miniature Aerial Vehicle). These individuals include a pilot, mission control specialist, and a flight director. The operators are comprised researchers from the Institute for Safety Security Rescue Technology (iSSRT), working through the Center for Robot-Assisted Search and Rescue (CRASAR). These workers go into an urban search and rescue environment and are tasked with searching for survivors after Hurricane Katrina in New Orleans. The pilot operates the MAV while the mission specialist controls the camera onboard the MAV and reports what is seen while taking video clips and still photos. A flight director maintains overall situational awareness and provides search and rescue expertise. The Petri net's state-transition network is used to map the behavior domain of the operators. The nets integrate the actions between operators (including device usage) and all inter-operator communications. The integration of cognitive work analysis and task modeling with Petri nets within the same framework allows for stringent analyses of the three operators' behavior to map variance in performance.

Presenter: Zayas-Cabán, Gabriel  
Research Mentor: Dr. Catherine Beneteau  
Title: A Non-linear Optimization Problem for Polynomials

In this poster I will present a specific optimization problem connected to polynomials of degree 2 in the unit disk in the complex plane. In particular, I will define what is called the Hardy space  $H^2$  and the corresponding Hardy space norm. The functions associated with the aforementioned polynomials have no zeros in the disk, which means that they can be expressed as exponentials. The goal of the research is to find the smallest Hardy space norm of these types of exponentials that satisfy two constraints. With the aid of the symbolic programming language Maple, I will try to identify significant patterns that appear in the Taylor expansions of these “non-vanishing” functions.