



HONORS COLLEGE

The University of Texas at Arlington

HONORS RESEARCH SYMPOSIUM PRESENTATION ABSTRACTS

NOVEMBER 18, 2016

SHIVAM ARORA, FINANCE

Title: *Identification of Leaders and Followers in US-Listed Indian ADRs and Domestic Listings of Underlying Stocks*

Faculty Mentor: Dr. David Rakowski

Information transfer between developed stock markets and major emerging markets around the world has expanded recently, with emerging market companies increasingly issuing securities in developed markets in order to finance their new-found needs for capital. This paper analyzes the lead-lag relationships between American Depository Receipts of Indian companies traded on major US stock exchanges and their respective underlying stocks traded in India. By using the univariate ordinary least squares regression statistical method, the study examines the strength of predictive signals between Indian and US markets. The study finds evidence of bi-directional causality. The strength of this predictive signal is stronger when US stock index returns are used to predict Indian index returns, than when Indian index returns are used to forecast US index returns. However, individual underlying Indian stock returns are stronger predictors of corresponding individual US ADR returns than vice-versa.

MARCUS BRAYMER, POLITICAL SCIENCE

Title: *The Comedy of Politics*

Faculty Mentor: Dr. Thomas Marshall

Throughout history satirists have mocked politicians. However, in recent years politicians have involved themselves in satire, making appearances on shows like *Saturday Night Live* and *The Daily Show*. These appearances and the increasing interest in satire has led to one question, does satire affect the public opinion of politicians? In order to answer this question an experiment was designed by creating three original videos. These videos answered this question by creating a fictional issue, politician, and satirist. The videos showed a fictional politician's support of an issue, a satirist making fun of this politician, and the politician making an appearance with the satirist to make fun of himself. Participants watched these videos and answered a series of questions that were designed to gauge the politician's likeability. Estimated results based on similar experiments are that these videos have no significant impact on the public opinion of the politician.

SARAH DAGGS, NURSING

Title: *The Role of WNT3a in Bone-Muscle Biochemical Crosstalk and Promoting Primary Myoblast Differentiation among Mouse Primary Muscle Cells*

Faculty Mentor: Dr. Marco Brotto

Bone and muscle crosstalk is an emerging field that focuses on the ability of bone cells and muscle cells to communicate with each other through physical and biochemical mechanisms. My thesis focuses on the effects of WNT3a, an important bone-secreted factor of the Wnt/ β -catenin pathway, on myogenesis. I confirmed both morphologically and at the genetic level that at concentrations ranging from 10 to 20 ng/mL of WNT3a, myogenic differentiation was increased, compared to controls. Molecules secreted by bone cells that can beneficially effect skeletal muscles might have an impact on the treatment of sarcopenia, osteoporosis, and other musculoskeletal diseases. Our studies could pave the way for future pharmacological interventions and new diet and exercise modalities that might lead to the elevation of WNT3a in bones and muscles. Our studies are in agreement with the Strategic Plan of the National Institute of Nursing Research (NINR), Advancing Science: Improving Lives.

MEGHAN GRESHAM, PSYCHOLOGY

Title: *Personality and Well-Being in Psittacines*

Faculty Mentor: Dr. Scott Coleman

Parrots are popular pets due to their high level of intelligence and complexity of social behavior; however, many develop abnormal behaviors, such as feather plucking, which can result in surrender to a shelter. This work investigates the link between personality traits, abnormal behavior, and subjective well-being in four genera of parrots living in a sanctuary. Through an online survey, volunteers well-acquainted with the parrots assessed their traits. Factor analysis determined which personality dimensions exist in each genera and correlation coefficients were calculated. This study found that highly neurotic parrots were significantly more likely to display abnormal behaviors and had lower subjective well-being scores overall. Cockatoos were the most neurotic genera in this sample. Highly extraverted parrots showed less abnormal behavior and had greater well-being scores, though no genera differed significantly. These results show that personality variation exists in parrots and has a measurable impact on well-being in captivity.

NEELIM HAIDER, COMPUTER SCIENCE ENGINEERING

Title: *Smart Hospital Management Tool*

Faculty Mentor: Dr. Christopher McMurrough

The UT Arlington Smart Hospital is a training facility for nursing students. Our goal was to create a web platform that allows the faculty to manage their hospital information in one place, as this information has previously been scattered among different websites and files. We first derived requirements for the site and using these, our team created a prototype of a website. We found that our website had the capability of implementing most of the features needed by the hospital, yet due to time and website development experience limitations, we could only implement some of the important features. In conclusion, the website was able to accomplish the most important feature of being able to provide interfaces that allowed the hospital to manage information in one place. Our project thus proved that it is a worthy investment to create a website that manages all of the Smart Hospital's information.

CHRISTINA KOO, BIOLOGY

Title: Effects of the Copper Tolerance Protein *bll2211 (copB)* in the Nodulation Process for Soybean Plants and Nitrogen-Fixing Bacteria *Bradyrhizobium Japonicum*

Faculty Mentor: Dr. Woo-Suk Chang

Bradyrhizobium japonicum is a nitrogen-fixing bacterium which forms a symbiotic relationship with leguminous soybean plants, converting atmospheric nitrogen into ammonia. The process of nodulation involves signaling components from the plant and activation of genes which promote nodule formation. Soybean lectin, which current function in plants is unknown, may be a crucial component in nodulation. In previous studies, the copper tolerance protein, *bll2211 (copB)*, was differentially expressed when exposed to soybean lectin. In this study, the role of environmental copper exposure was investigated to understand the role of soybean lectin in growth and nodulation of *B. japonicum*. We examined this by construction of a growth curve and performing a pouch experiment at various concentrations of copper for *B. japonicum* and its mutant $\Delta copB$. Overall, there was less growth, nodule formation, and nitrogen-fixation in $\Delta copB$. Thus, soybean lectin and *copB* may play a role in nodulation between *B. japonicum* and soybean plants.

JESSICA LILLEY, BIOLOGY

Title: *Nanomaterial-Assisted Laser Desorption Ionization for Mass Spectrometry-Based Detection of Street Drugs on Fingertips*

Faculty Mentor: Dr. Kevin A. Schug

As drug possession arrests continue to skyrocket, law enforcement agencies need access to an efficient and accurate method of accessing guilt. Mass spectrometry (MS) is a commonly used technique to precisely identify a compound of interest. Compared with classical matrix-assisted laser-desorption ionization (MALDI) MS, nanomaterial-assisted laser desorption-ionization (NALDI) MS can generate a clean background for small molecules, such as designer drugs. Unexpected points of oxidation with high intensity were present from the drugs 4-FMC, 3-FMC, Pentedrone, and 4-MEC in NALDI MS and were confirmed through subsequent experiments of the same samples with MALDI MS and was proven to be an applicable mass/charge (m/z) ratio to identify the drug through fingerprint scans at a concentration of 100 μ M. The molecular structure of the unknown oxidation points were theorized for 4-MEC through the use of collision induced dissociation (CID) and elemental analysis. These points of oxidation can be used by law-enforcement personal to expedite the laboratory process associated with illegal substances.

NINA LING, NURSING

Title: *Compliance with Hand Hygiene Policy in a Nursing Home: A Pilot Study*

Faculty Mentors: Dr. Deborah Behan & Dr. Kathryn Daniel

The gerontological population is now the biggest population in health care. This population has a weaker immune system than younger populations. Therefore, Infection prevention is important in preventing the geriatric cascade, and decline in quality of life. This project examines the nursing staff's attitude and performance of hand washing hygiene, which is the best way to reduce infections. Healthcare providers were observed for hand washing hygiene, and then surveyed on their attitude of the practice. Healthcare providers showed different attitudes than what was observed. Perhaps a new guideline should be created that addresses a home atmosphere for hand washing hygiene in the nursing home.

NADINE SHIHABEDDIN, BIOLOGY

Title: *Neuroprotective Effect of Basil Leaf Extract on Hippocampal Cell Line Exposed to Ethanol*

Faculty Mentor: Dr. Subhrangsu S Mandal

Basil plant (*Ocimum basilicum*) is a common part of the South Asian diet, and it is known to act as an antioxidant after consumption. To understand the potential of basil to relieve oxidative stress and to assess its neuroprotective effect, mouse hippocampal cell line (HT-22) were exposed to ethanol and to basil extracts simultaneously. The toxicity of the hippocampal cells was reduced significantly with the addition of the basil extract, and significantly higher cell viability was detected as compared to the ethanol treated control cells with no basil extract. These data suggest that basil can act as a neuroprotective agent with potential against oxidative stress-induced cell death, potentially leading to aid in neurological disorders that undergo oxidative stress.

MICALAH SPENRATH, EARTH AND ENVIRONMENTAL SCIENCE

Title: *Identification of the Plateau Of Cadmium Extraction From Aqueous Solution by Invasive Macrophyte: Eichhornia Crassipes*

Faculty Mentor: Dr. James Grover

Cadmium is an extremely deleterious heavy metal characterized by high toxicity and environmentally disruptive and difficult removal. Utilizing an aquatic macrophyte, *Eichhornia crassipes*, as a phytoremediant of cadmium has been shown to be experimentally viable and less environmentally degrading than conventional methods of heavy metal remediation. To further understand the time required to optimize cadmium uptake and minimize the rerelease of contaminants, *E. crassipes* was studied to identify the plateau of cadmium extraction. The experimental plants were housed in aquatic environments with cadmium concentrations of five ppm for 144 hours. Water samples were analyzed in atmosphere in a Shimadzu EDX- 7000 Energy Dispersive X-ray Fluorescence Spectrometer for 100 seconds per sample to determine cadmium concentration. A singular plateau trend was not observed in this study; instead, cadmium concentration exhibited an undulating pattern in which cadmium uptake and release occurred multiple times within a 144-hour window.

KIAYRA SPIGHTS, PSYCHOLOGY

Title: *Exercise as an Approach to Alleviate Chronic Low Back Pain (CLBP)*

Faculty Mentor: Dr. Robert Gatchel

Chronic pain affects millions of people each year, and has an adverse impact on both the individual and society. This study investigated the effect of an exercise program on chronic low back pain, low back flexibility, and sleep disturbances within the geriatric population. It was hypothesized that the implementation of a long term exercise program would promote a decrease in chronic low back pain and the number of sleep disturbances. It was also hypothesized that the implementation of an exercise program would increase an individual's low back flexibility. The results supported the hypothesis. Conclusively, the implementation of an exercise program can relieve low chronic back pain and psychosocial issues associated with low chronic back pain.

NATALIE THOMAS, POLITICAL SCIENCE

Title: *The Effect of the Feminist Movement on Women's Political Involvement in the United States*

Faculty Mentor: Dr. Susan Hekman

As of 2014, the United States of America ranks 97th in the world- out of 193- for women in legislature despite a long history of women's rights movements. I compared the timeline of the feminist movement in the USA to the history of women's political gains in order to determine what effect, if any, the women's rights movement had on political engagement. With the chronology compared, it is easy to see if there were any specific points in the feminist movement that motivated women to become more politically active. Women's political involvement increased after the 19th amendment was ratified, following World War II, and during the Sex Revolution of the late 1960s and early 1970s. However, only 20% of Congress is female and a lack of young women entering the political arena now gives little hope that women's political involvement will drastically increase soon.
