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Abstracts 2011: Highlights of Student Research and Creative Endeavors

Columbus State University

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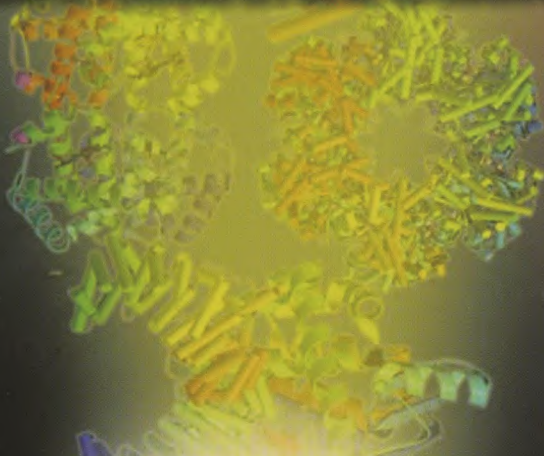
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ABSTRACTS 2011

Highlights of Student Research and Creative Endeavors



COLUMBUS STATE
UNIVERSITY

Abstracts 2011: Highlights of Student Research
and Creative Endeavors

Published May 2011

by

Columbus State University
Honors Program

*Thanks to the Momentum Editorial Board for designing the format and editing,
and to the Office of the Provost for funding the publication of this first edition.*

Abstracts 2011: Highlights of Student Research and Creative Endeavors

What follows is a collection of abstracts summarizing the scholarship conducted by undergraduates at Columbus State University during the 2010-2011 academic year. These projects highlight undergraduate research conducted in a wide variety of disciplines, ranging from scientific studies to creative theatrical productions based upon scholarly reviews and analyses. The abstracts represent many ongoing projects on our campus and catalog those that have been published or presented.

This volume begins with articles published in *Momentum, Columbus State University's Journal for Research and Critique*, and continues with projects that have been selected for presentations at national, regional and statewide disciplinary conferences. Among them are several that have garnered awards for outstanding research, such as Ms. Nylvia Ware's biology project studying the herpes simplex virus, which was not only honored by multiple awards but also received an invitation to the national biological honors conference next year. Projects that have received competitive research grants, including our campus Undergraduate Research & Scholarly Activities Grants, are also featured.

Many undergraduates have presented their work with our local community, either through the dissemination of best practices in nursing to regional hospitals, colloquium presentations of lecture-recitals at the RiverCenter for the Performing Arts, or at Columbus State University's Tower Day held in April 2011.

Together these abstracts demonstrate the commitment of our faculty to engage students in their disciplines and represent outstanding mentorship that occurs on and off our campus throughout the year. Our students have amassed an impressive collection of works that contribute not only to academia but to our local community, and their work will hopefully inspire others to delve into scientific and creative inquiry.

Annual Report of the Board of Directors

The Board of Directors is pleased to report that the company has achieved significant milestones in the past year. Our primary focus has been on expanding our market reach and improving operational efficiency. We have successfully launched several new products and services, which have been well-received by our customers. Additionally, we have implemented a series of cost-saving measures that have resulted in a more streamlined and profitable organization. The financial performance of the company has been strong, with a steady increase in revenue and a decrease in expenses. We are confident that these efforts will continue to drive our success in the coming year.

Our strategic vision for the future is centered on innovation and customer-centricity. We will continue to invest in research and development to bring you cutting-edge solutions that meet your needs. Furthermore, we are committed to providing exceptional customer service and support, ensuring that your experience with us is always positive. We also plan to explore new market opportunities and expand our global presence. By staying true to our core values and maintaining a strong focus on our customers, we believe we can achieve long-term growth and success. We thank you for your continued support and look forward to a bright future together.

The Board of Directors is composed of the following members: [List of names]. Each member brings a wealth of experience and expertise to the table, ensuring that we are well-equipped to handle the challenges of the business world. We are grateful for the trust and confidence you have placed in us, and we are committed to upholding the highest standards of integrity and transparency. Our goal is to provide you with the most reliable and effective services possible, and we will continue to work hard to exceed your expectations. We look forward to a successful and productive year ahead.

In closing, we want to express our sincere appreciation to all of our employees, partners, and customers for their dedication and support. It is their collective efforts that have made our company what it is today. We are proud to be part of a team that is passionate about its work and committed to excellence. We will continue to strive for the highest quality in everything we do, and we are confident that our future is bright. Thank you for being a part of our journey.

Respectfully,
[Signature]

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PUBLISHED SCHOLARSHIP

Toward a Better Story: A Paradigm for Positive Communication in The Lord of the Rings

This paper examines a textual analysis of J.R.R. Tolkien's modern classic tale, *The Lord of the Rings*, for the purpose of uncovering a paradigm for positive interpersonal, intergenerational, and intercultural communication. The paper begins with a brief explanation of Walter Fisher's narrative paradigm, which contextualizes the relationship between positive communication and an epic narrative such as *The Lord of the Rings*. Following the description of Fisher's theory, a summary of analysis by Bowman (2006) on metanarrative aspects of *The Lord of the Rings* is presented as the foundation for the analysis offered in this paper. The remainder of the paper reveals a paradigm for understanding our own lives as stories constructed from these metanarrative aspects of *The Lord of the Rings*. Using this paradigm, a framework for positive interpersonal, intergenerational, and intercultural communication is presented, thus establishing the positive correlation between these aspects of communication and good stories.

Brandon Griffith,

*Faculty mentors:
Dr. Bill Edwards
Dr. Danna Gibson
Department of
Communication*

Published:

Momentum: CSU's Journal for Undergraduate Research & Critique, Spring 2011
(Volume 1, Issue 1)

Based upon a previously presented paper at:

CSU Tower Day 2010

Southern States Communication Undergraduate Honors Conference, March 2010

This project was funded in part by: CSU's Undergraduate Research & Scholarly Activities Grant & CSU Department Funds, \$375

For Self or Not For Self: The Victorian Dilemma

Esther Howell,

Industrialization, imperialism and the concept of evolution in Victorian society caused self-doubt and self-conscious speculation amongst the English people. These themes can be seen in Victorian Literature. My paper connects Thomas Carlyle's ideal of self-consciousness as a means to man's greater good in Sartor Resartus with the same ideal in Jonathan Stuart Mill's Autobiography and Robert Browning's "A Toccata of Galuppi's" and "Abt Vogler."

Faculty mentor:

Dr. Daniel Ross

Department of English

Published:

Momentum: CSU's Journal for Undergraduate Research & Critique, Spring 2011
(Volume 1, Issue 1)

Beyond the Score: Using Alternative Sources in an Examination of Historical Performance Practice

Despite being composed nearly 300 years ago, the Sonatas and Partitas for Violin without Bass accompaniment by Johann Sebastian Bach (1685-1750) remain some of the most technically and stylistically challenging repertoire studied and performed by violinists today, in part because no record from the composer, apart from the manuscript score, exists detailing how to perform the works. One specific technical challenge is the execution of three and four-note chords in precise rhythmic accordance with Bach's notation. In this essay, an analysis of musical conventions in the era referred to as the Baroque (1600-1750) shows that notation need not be followed strictly. Additionally, an examination of the violin and bow as developed by the 18th century, treatises on musical performance, and the scores of the Sonatas and Partitas themselves reveal how Bach may have intended performers to execute these chords.

Emily Vold

*Faculty mentor:
Dr. Andrée Martin,
Schwab School of Music*

Published:

Momentum: CSU's Journal for Undergraduate Research & Critique, Spring 2011
(Volume 1, Issue 1)

Forensic Analysis of iPod Touch Generation 2

Charles Yates, The digital forensic science for Apple iPods face the challenge of keeping pace with the fast progress of technology. While the popularity and widespread use of Apple iPod have increased the possibility of its being used in crime, sound and legally acceptable procedures of forensic investigation are yet to be developed. Apple iPod Touch devices, launched for the first time in 2007 are significantly different than older iPods in many ways. We investigated the Apple iPod Touch generation 2 from a digital forensic perspective. In this paper, we describe our investigation techniques and findings.

Faculty mentor:
Dr. Lydia Ray
TSYS School of Computer
Science

Published:
Momentum: CSU's Journal for Undergraduate Research & Critique, Spring 2011
(Volume 1, Issue 1)

PRESENTED AT NATIONAL AND STATE CONFERENCES

REU at MSU from CSU: The Importance of Undergraduate Research

The Peroxisome 2010 research project involves identifying proteins within peroxisomes from three different growth stages in *Arabidopsis thaliana*. These proteins were confirmed to be peroxisomal by a team of researchers in the laboratory of Dr. Jianping Hu of Michigan State University and eventually their peroxisomal localization was confirmed through bioinformatics. My role in the research project this past summer was to work on various seeds of *A. thaliana* and identify T-DNA insertion mutants for these lines. I also completed several phenotypic assays of several resulting mutants and my goal was to identify a defect in a gene that would display an abnormal phenotype. This particular phenotype would allow us to understand the function of peroxisomes and its relation to the B-oxidation pathway. The ultimate goal of this project is to understand more functions about peroxisomes and its role in *A. thaliana*. I was able to participate in this research project through a Research Experience for Undergraduates (REU) at Michigan State University. I participated in the Plant Genomics 2010 program funded primarily through the National Science Foundation.

Khaliyah Abikoye

*Faculty mentors:
Dr. Monica Frazier
Department of Biology*

*Dr. Jianping Hu
Principal Investigator
Michigan State
University*

*Dr. Gaelle Cassin
Mentor-Post Doctorate
Fellow
Michigan State
University*

Presented:

CSU Tower Day 2011

Michigan State University Plant Genomics, July 2011

This project was funded in part by:

The National Science Foundation Research Experiences for Undergraduates Program, \$5000

Social Exclusion in Stewart County, Georgia - An Ethnographic Study

*Amanda Alexander
Jessica Cheatham*

*Faculty mentor:
Dr. Florence Wakoko-
Studstill
Department of
Criminal Justice &
Sociology*

Stewart County was established in 1830, and within a century this west Georgia settlement succeeded as one of the state's top three cotton producers. Following the 1930's however, the prosperity of Stewart County began to decline. In recent years, it has suffered from an epidemic of increasing poverty, unemployment and crime. With a population of approximately 5,000 individuals, Stewart County has a staggering percentage of uneducated and unemployed citizens with significant numbers of incarcerated youth. These realities are manifested through, and perpetuated by the legacy of racial and class inequalities in education, access to health care, and employment. Through the use of ethnographic research and telephone-interviews, this research explores attitude towards development in Stewart County and underlying factors attributing to current levels. Findings reveal educational attainment, crime rates, and infrastructure as key factors in development. Our research, in combination with previous studies' analysis of social capital and community well-being, emphasize the necessity of heightened investments in social networks and relations, as well as improved public services and greater financial investment, as key to improving conditions in Stewart County.

Presented:
CSU Tower Day 2011
Rural Sociology Society Annual Meeting, August 2010

This project was funded in part by:
CSU's Undergraduate Research & Scholarly Activities Grant, \$300

Borges, Cortázar, and Valenzuela: World Views and Literary Styles

The essay that I present will be devoted to short stories written by Jorge Luís Borges, Julio Cortázar, and Luisa Valenzuela, and to the ways in which these writers and their works have established productive dialogues with critical theory and with other literary traditions. In order to understand the significance of their contributions, I will consider their fictional works in light of literary traditions in Latin America after Modernismo, the structuralist revolution in contemporary theory in the 1950's and 1960's, post-structuralist strategies, feminist theory, and post-colonial theory.

Heather Bostick

*Faculty mentor:
Dr. Alyce Cook
Department of Modern
& Classical Languages*

Presented:

Thirteenth Annual Conference on the Americas, February 2010

Chemoselective Oxidation of 6,13-bis(decylthio)pentacene

Eunhye Cho The need for an alternative source of green energy is getting more urgent every day. Recent research interest in the use of organic semiconductor based photovoltaics has sparked widespread studies into the optimization of such devices for practical and efficient use and application of the devices in energy producing mechanisms.

Faculty mentors: Organic semiconductors present much potential for daily and industrial use because of its possible low cost production. Pentacene and pentacene derivatives are promising candidates for organic semiconductor research because they exhibit similar conduction mechanisms to inorganic semiconductors with hole and electron conduction layer, and band gap in addition to their organic semiconductor properties. The research was performed to chemically control the chemoselective oxidation of the compound, thio substituted pentacene derivative. The products of this experiment were as follows: 6-(decylsulfinyl)-13-decylthio)pentacene; 6,13-bis(decylsulfinyl)pentacene and; 6,13-bis(decylsulfinyl)pentacene;; The products of the experiments were analyzed using NMR, UV vis, and Mass spectra to confirm the formation of the products and also to compare the products of each reaction to one another.

Dr. Anil Banerjee
Dr. Floyd Jackson
Dr. Joseph Rugutt
Dr. Rajeev Dabke
Dr. Samuel Abegaz
Department of
Chemistry

Presented:

CSU Tower Day 2011, Outstanding Research & Creative Scholarship Award
University of New Hampshire, August 2010
Boston Science Museum, August 2010

This project was funded in part by:

The National Science Foundation Research Experiences for Undergraduates program, \$5000

Social Networking, Administrative Liability, and Legal Privacy

The availability of personal information for consumption by both local administrators and businesses is extensive, and its legal usage presents a liability in consideration of the American right to privacy. We have determined that an analysis of the continually evolving right to privacy, in association with the large-scale utilization of social networking websites and resulting administrative liabilities and responsibilities is necessary for the protection of civil liberties and administrative legality.

Mark Davis

*Faculty mentor:
Dr. Kimberly Gill
Department of Political
Science*

Presented:

Georgia Political Science Annual Conference, November 2010

This project was funded in part by:

CSU's Undergraduate Research & Scholarly Activities Grant, \$375

Relationship Between Taster Type and Drink Preference

*Paul Evans
Dawn Harless*

*Faculty mentor:
Dr. Stephanie Da Silva
Department of
Psychology*

The purpose of this study was to determine if there are any associations between taster type and preference for sweetness in drinks. It was anticipated that super-tasters would more often prefer the sweetest drink (of 3 levels of sweetness) compared to medium-tasters and non-tasters.. A survey first was given to the 100 participants to gather health information and then they tasted a P.T.C strip and reported levels of bitterness detected. Lastly, the participants drank small amounts of lemonade, tea, and Kool-Aid®, each of which differed in sweetness level, and then chose which sweetness level they preferred. When taster types were categorized into three levels, the overall findings were not significant; however, significant relations between drink preference and taster type were found when taster type was defined as super-taster or non-taster. Limitations are discussed and further research is suggested.

Presented:
CSU Tower Day 2011
Georgia Undergraduate Research In Psychology Conference, April 2011

Visible Souls: The Competing Narratives of Tolkien and Pullman

This paper presents evidence for the rhetorical significance of the storytelling genre of fantasy. As key examples of this significance, the fantasy narratives of J.R.R. Tolkien's *The Lord of the Rings* and Philip Pullman's *His Dark Materials* offer opposing mythologies that aim to shape the worldviews of readers. Synopses of the stories are provided, and the two competing narratives are then analyzed using the Logic of Good Reasons of Fisher's Narrative Paradigm theory. Contrastive values are mined from the narratives and panned for their relevance, consequences, consistency, and transcendence. The findings uncover the power of arguments that are not merely propositional, but that are visibly clothed in characters and plot. .

Brandon Griffith

*Faculty mentor:
Dr. Danna Gibson
Department of
Communication*

Presented:

CSU Tower Day 2011

Southern States Communication Undergraduate Honors Conference, March 2011

This project was funded in part by:

CSU's Undergraduate Research & Scholarly Activities Grant & CSU Department Funds, \$300

Applying the Agenda-Setting Theory: The Search for Weapons of Mass Destruction

Adrian Hall The belief that Saddam Hussein had weapons of mass destruction was the primary reason the United States went to war with Iraq after 9/11. The Agenda-Setting Theory is a theory that focuses on how the media influence the public on certain issues. After weapons inspectors from the U.S. declared “No WMD’s,” the media and public became critical of the war in Iraq. The research examines media salience and media framing of the coverage of the news in Iraq. The public’s influence was also key in changing the politics of the war in the creation of the Iraq Study Group after finding no weapons of mass destruction. After the research was finished, the Agenda-Setting Theory is still valid today after many years of applying the theory to other cases.

Faculty mentor:
Dr. Danna Gibson
Department of
Communication

Presented:
CSU Tower Day 2011
Southern Communication Conference Association, March 2011

This project was funded in part by:
CSU's Undergraduate Research & Scholarly Activites Grant & CSU Department Funds, \$375

Removing Obstacles to Self-Sufficiency: A Communication Approach to Support Network Building

This paper presents secondary and primary research gathered throughout the duration of a study on the impact of perceived social support among individuals identified as at-risk for terminal under or unemployment who were enrolled in a communication-based worker-training program. Procidano & Heller's (1983) Perceived Social Support from Friends scale is used to measure the levels of social support a class of ten welfare-dependent women enrolled in the 12-week holistic, communication-based occupational and personal skills training program perceive to be receiving from their social network of friends. While results reveal no significant differences between the students' levels of perceived social support from friends from the beginning of the program to six months post graduation, results do indicate an increase in mean scores during this time frame, signifying students' gradual understanding and application of strategically building a supportive network that helps them survive and thrive in the college classroom and/ or workforce.

Kate Hargrove

*Faculty mentor:
Dr. Danna Gibson
Department of
Communication*

Presented:

CSU Tower Day 2011

The Theodore Clevenger, Jr. Undergraduate Honors Conference of the Southern States Communication Association, March 2011

Illegal Immigration a Threat to National Security

Jodian Jenkins This research paper focuses on the concept that illegal immigration is a threat to U.S. national security. The research proposes several factors as to why illegal immigration is a threat. It discusses the controversy over Arizona's illegal immigration law, the federal government's reaction towards Arizona's illegal immigration law, activities carried by illegal immigrants, and President Obama's solution to combat illegal immigration. A qualitative approach was used to determine solutions to combat illegal immigration.

Faculty mentor:
Dr. Gregory Domin
Department of Political
Science

Presented:
CSU Tower Day 2011
Georgia Political Science Conference, November 2010

This project was funded in part by:
CSU's Undergraduate Research & Scholarly Activities Grant, \$300

Expressions of Beauty: How Emotion Expression Affects Perceptions of Beauty

Beauty is defined culturally. However, language and beliefs are not needed to interpret facial expressions. Nonverbal cues, such as facial expressions, affect how we interpret people around us. This study examines how altering facial features to express or mimic an emotion influences how people are perceived in relation to beauty or attractiveness. The study tested 84 participants using 36 randomized pictures of 18 different anonymous women expressing either no emotion (neutral) in one photograph and either happiness or sadness in her second photograph. Results showed that happy expressions are rated significantly more attractive than neutral or sad expressions, and that women sad expressions are rated significantly lower than either happy or neutral expressions, even at times when rating the same woman.

Ashley Shipp

Faculty mentor:

Dr. April Phillips

Department of Psychology

Presented:

CSU Tower Day 2011, Outstanding Research & Creative Scholarship Award

Georgia Undergraduate Research In Psychology Conference, April 2011

Interpretative Strategies for a Mill Village Cultural Landscape

*Robert Thomas
& Amanda Rees, Ph.D.*

*Faculty mentor:
Dr. Amanda Rees
Department of History and
Geography*

In October 2008 one of the largest cotton mills in the American South burned to the ground. Located amidst the village of Bibb City this massive building was surrounded by 200 company-built homes and community buildings making it a unique cultural landscape. Surrounded by Columbus, Georgia, this community faced the fire's devastation with grief, remembrance, and concern for the future. In our Maymester cultural landscapes class (2009) we joined the Department of Theatre to devise various interpretive strategies to tell the Bibb City story. Using Tilden's (2007) interpretive principles this poster analyzes where we met the goals of effective interpretation by analyzing methods and strategies including: the exhibition and children's exhibition guide, a community self-guided tour accompanied by an audio podcast, "in character" walking tours, an oral history performance, and a website publishing our work. By applying spatial thinking to field-based cultural landscape analysis, introducing interpretive strategies into cultural landscape study, and developing writing strategies engaging a general audience, we interpreted this unique cultural landscape to over 340 participants.

Presented:
SouthEastern Division of the Association of American Geographers Conference,
November 2010

Antiviral Effects of Lactoferrin at Different Stages of Herpes Simplex Virus Type 1 Infection of Vero Cells

Lactoferrin (Lf) is an iron-binding glycoprotein found in mucosal secretions, such as tears and saliva, making it part of the first line of defense against pathogens. Previous studies have shown Lf possesses antimicrobial properties including inhibitory effects against viruses. This project examined the effects of Lf on herpes simplex virus type 1 (HSV-1) at different stages of infection in Vero cells. In the first experiment, a concentration-dependent reduction in plaque-forming units (PFUs) was observed when Lf and HSV-1 were simultaneously added to Vero cells. For the second experiment, HSV-1 and Lf were incubated together prior to inoculation onto Vero cells. HSV-1 was inoculated onto Vero cells pretreated with Lf in the third experiment. A significantly greater reduction in PFUs was observed with HSV-1 pretreated with Lf than with Vero cells pretreated with Lf. In the fourth experiment, in which Lf was added to HSV-1 attached to but not penetrating Vero cells, significant inhibition was also observed. These results indicate that Lf has a direct antiviral effect on HSV-1 rather than a cell-protective effect.

Nylvia Ware

*Faculty mentor:
Dr. Milwood Motley
Department of Biology*

Presented:

CSU Tower Day 2011, Outstanding Research & Creative Scholarship Award
Southeastern Branch American Society for Microbiology Conference, November 2010,
Second Place Award in Undergraduate Clinical and Veterinary Microbiology
Regional Tri-Beta Conference, April 2011, First Place Award
Invited to National Tri-Beta Conference, Puerto Rico in May 2012

This project was funded in part by:

TriBeta Research Foundation Scholarship, \$550

Numerosity Perception and the P300 ERP

Wade White

*Faculty mentor:
Dr. Mark Schmidt*

Department of Psychology

Subitizing and preverbal counting are two proposed processes for the enumeration of small sets of briefly presented items. Preverbal counting is a slower, sequential process used for enumeration of > 3 items, while subitizing is a faster, perhaps parallel process used for enumeration of 1-3 items. The P300 event-related potential (ERP) is a broad, high amplitude positive potential typically occurring between 300 and 700 ms post-stimulus. The amplitude and latency of the P300 are thought to reflect aspects of stimulus processing such as, novelty, discriminability, and salience. In the present study, RT, accuracy, P300 amplitude, and P300 latency were recorded at the Pz parietal site in response to briefly represented dot displays, ranging from 1-8. Dots were presented for 150 ms on each trial. Fifty trials at each level of numerosity (1-8) were presented for a total of 400 trials. Participants were instructed to say as quickly and as accurately as possible how many dots they saw on each trial. Two competing hypotheses were tested. First, it was predicted that P300 amplitude and latency may mirror the accuracy and RT results seen in previous studies. A second, competing hypothesis based on adaptation level theory (Helson, 1964) would predict that P300 amplitude reflects the degree a stimulus deviates from the current adaptation level (AL), a kind of continuously updated weighted mean of environmental stimuli. In the present study, the AL would be 4.5 dots (the mean of 1-8). Larger P300 amplitudes would be associated with numerosities far from the AL with smaller amplitudes associated with numerosities close to the AL. These response time and accuracy results mirror results from previous studies. P300 amplitude differed as a function of numerosity ($p < .001$) and provided some support for adaptation level theory. A non-significant relationship U-shaped curve ($R^2 = 0.19$, $p > .05$) was found between amplitude and numerosity, with larger amplitudes associated with both the smaller, and larger numbers of dots. P300 latency did not differ as a function of numerosity ($p > .05$). A possible interaction of the two hypotheses and the limitations of latency measures are discussed.

Presented:

Georgia Undergraduate Research in Psychology Conference, April 2011.

*This project was funded in part by:
CSU Department Funds*

FUNDED PROJECTS

The following abstracts feature undergraduates who have received competitive research grants that provide critical support for their projects. Several of our undergraduates have also benefited from larger research grants awarded to the institution as well as those provided by the generosity of community partners. In addition, Columbus State University has offered a competitive grant program to support and promote the research, scholarly and creative efforts of our undergraduate students. The Undergraduate Research and Scholarly Activity Grants award funding up to \$300 per semester, but are often supplemented by departmental funds.

Funding provides critical support often needed to complete projects. Undergraduates engaging in research have submitted proposals that enabled the purchase of items such as artistic supplies, photography and audio recording equipment, and scientific apparatus. In addition, grants have supported travel that enabled undergraduates to conduct sociological interviews, collect water samples, and disseminate research findings. The undergraduate researchers in this section are recognized for writing successful grant proposals as well as presenting their findings.

The Effect of Brilliant Blue G and Methylprednisolone Acetate on IL-1 β mRNA levels in Trauma-induced Astrocytes

Ifeoma Akuta Spinal cord injuries involve two stages of inflammation: the initial mechanical tissue destruction and secondary exacerbated tissue loss from physiological and biochemical changes. Also, inflammation involves a high number of chemicals released, especially cytokines. The most common chemical released during inflammation is a cytokine called Interleukin-1 Beta (IL-1 β). This cytokine has been shown in numerous studies to cause cell death during inflammation. Astrocytes are the most abundant glial cells in the central nervous system. They help form the blood-brain barrier, which helps limit substances from entering the brain. They help with neuronal communication in the brain and form scar tissue to replace damaged nervous tissue. There is little information known about astrocytes' role during inflammation. Plus, there is little information about whether methylprednisolone acetate and Brilliant Blue G, two inflammatory inhibitors, can help hinder the effects of inflammation together on a type of brain cells. My research is to help determine if the combination of methylprednisolone acetate and Brilliant Blue G can hinder inflammation around astrocytes.

Faculty mentor:
Dr. Kathleen Hughes
Department of Biology

Presented:
CSU Tower Day 2011

This project was funded in part by:
CSU's Undergraduate Research & Scholarly Activities Grant & CSU Department Funds, \$4000

Nitrate Phytoremediation Using Gempler's Test Kits

Nitrate is a naturally occurring ion found in nature. However, high levels can have harmful effects on human health. In the past, testing for aquatic nitrates in the field have been a difficult and complicated task. Gempler's is a commercial work-supply company and offers a range of nitrate kits to be used in the field. Gempler's test kits were tested for accuracy in detecting a change in nitrate level in both water and aquatic plants. Comparing the kits data with a nitrate probe and light absorption spectroscopy will allow us to determine the kits accuracy and efficacy in detecting change. Initial data indicates that the water nitrate kits can detect a change in nitrate levels, however an exact amount is not possible. The plant nitrate kits indicate that they are not able to detect a change in aquatic plant nitrates, however, this could be due to the fact that the plants are not storing nitrates.

Rae Bucher

Faculty mentors:

Dr. Julie Ballenger

Dr. John Barone

Department of Biology

Presented:

CSU Tower Day 2011

This project was funded in part by:

Beta Beta Beta, \$293; Columbus Water Works, \$600

Efficacy of the *rbcL*+*matK* Barcode in the Taxonomically Complex Groups of *Rhododendron*

Patricia Campbell DNA barcoding is the use of regions of an organism's DNA to identify its species. With *CoxI* established as the barcode in animals, *rbcL*+*matK* has been identified as a suitable barcode for plants. Recently, ITS2 has also been gaining support as an adequate barcode for both plants and animals. Although these barcodes show relatively high species resolution in floristic studies, their efficacy in taxonomically complex groups remains poorly understood. Here, I tested the efficacy of the *rbcL*+*matK* and ITS2 barcodes in a taxonomically complex group of *Rhododendrons*. Samples were collected at Callaway Gardens, GA, and sequenced for all three gene regions. To determine species resolution for single regions and any pairwise combinations an all to all BLAST procedure was performed using sequences as both query and database. Sequence recoverability was low for *rbcL* and *matK* (<50% of samples) and high for ITS2 (~90% of samples). The *rbcL*+*matK* barcode achieved 92% species resolution whereas the ITS2 barcode only resolved 45% of the species. This work represents one of the few studies that evaluate the performance of the *rbcL*+*matK* and ITS2 barcodes in a genus of broad taxonomic dispersion.

Faculty mentor:
Dr. Kevin Burgess
Department of Biology

Presented:
CSU Tower Day 2011

This project was funded in part by:
CSU's Undergraduate Research & Scholarly Activities Grant, \$300

When Dialogue Theory Becomes a Powerful Social Media Tool

In February 2010, I was considered a regular customer who ate at Chick-fil-A restaurant many times during the week. It was not just the quality of food that attracted me to this restaurant, but it was the service that I always received from the employees. One day, I was asked to help out with a Social Media Project on Facebook. As a customer, I was given the challenge if I could design a Facebook Page and obtain 250 FANS in a weeklong period, I would receive Chick-fil-A for a year. Of course, I took this offer but I wanted the number to be more challenging. In one week I managed to have 1500 FANS on the Chick-fil-A Bradley Park Facebook Page. The next time I went to the restaurant to order my chicken sandwich, I was offered a marketing job at the store too. In six months I was promoted to Unit Marketing Director of the store. I have seen first hand how Social Media is an imperative tool to connect with customers. My present research explores how Uses and Gratifications Theory, with its focus on the audience, instead of the actual message, can provide unique insight into why social media is so successful in Chick-fil-A marketing. According to the theory, the audience is responsible to use the medium in order to meet their needs. The Facebook page was designed to meet the needs of the consumer. In this fast pace environment, majority of our customers find that the Facebook page allows them to find out the information when they want it. I can post the event, I can send out reminders, and I can even offer great promotions, but it comes down to the consumer if he/she chooses to view the page or participate in the events.

Hayley Henderson

*Faculty mentor:
Dr. Danna Gibson
Department of
Communication*

Presented:

CSU Tower Day 2011, Outstanding Research & Creative Scholarship Award

This project was funded in part by:

CSU's Undergraduate Research & Scholarly Activities Grant, \$300

Best Practice Analgesia in Second Stage Laboring Patients with Focus on PCEA

*Annestasia Alderson
Maegan Bell
Nicole Richardson
Allison Cantrell
Kimberly Thomas*

*Faculty mentor:
Dr. Cheryl Smith
School of Nursing*

Though overall neonatal and maternal outcomes are similar between all methods of epidural analgesia, the use of Patient-Controlled Epidural Analgesia (PCEA) is recommended above other methods of epidural analgesia. Evidence has shown that PCEA reduces the total dose of local anesthetic administered, gives the patient a greater sense of control, and increases maternal satisfaction while providing the same degree of pain relief as the other epidural methods. This is true for nulliparous and multiparous patients alike. (1) PCEA with a background infusion is recommended as studies have shown that this decreases the incidence of breakthrough pain when compared to PCEA alone. (2) When choosing medications to use for PCEA, butorphanol as an adjuvant to bupivacaine has been proven to provide better pain relief than midazolam as an adjuvant to bupivacaine and bupivacaine alone. (3) A larger volume of medication has been proven to provide better pain relief as patients remained comfortable for longer amounts of time with less breakthrough pain. (4) Pruritus has shown to be the main side effect reported by patients receiving PCEA; Assess for pruritus and treat as ordered by physician. (5) It is recommended that food intake be restricted during labor and that the intake of clear fluids be limited to decrease maternal nausea and vomiting, leading to increased maternal satisfaction. (6) We recommend ambulation with assistance until patient demonstrates full motor function of the lower extremities. (7) Assessment is a key factor in ensuring the success of this pain relief method; assess patient vital signs for hypotension, hypertension, tachycardia, and depressed respirations before and during administration; assess that adequate pain management is occurring using an accepted pain scale; ensure that the patient is alert and oriented to determine if this method is appropriate for the patient; Assess patient for best learning method and teach patient how to correctly use the device; ensure learning has occurred by correct repeat demonstration by patient.

Presented:

CSU Tower Day 2011
Columbus Regional Medical Center, November 2010

This project was funded in part by: Sigma Theta Tau

Potential Cytotoxicity of Colored Orthodontic Latex Bands to Human Fibroblast Cells

Orthodontic rubber bands are made of latex and although generally thought to be non-bioreactive, the compositional protein in latex is a known allergen. Colored rubber bands are becoming highly popular and could pose threats if they release chemicals that are toxic. These rubber bands are retained in the mouth for long periods of time, ranging from just two weeks to two months, with the average being one month. Human fibroblast cells were grown in culture using Dulbecco's Modified Eagles Medium in which orthodontic bands had been soaked for 30 days at 37°C. Colors of dyed bands used were black, red, blue and orange. Bands without coloration (clear) were used as a control for dye release. Media exposed to no bands was used as a control for any chemical release. Cell viability percentages and 24-hour growth rates were used to assess effects on the cells. Single factor ANOVA tests revealed no significant difference in cell viability among the varying colors of bands.

Roma Patel

Faculty mentors:

Dr. Glenn Stokes

Mr. Carson

Stringfellow

Department of Biology

Presented:

CSU Tower Day 2011, Outstanding Research & Creative Scholarship Award

This project was funded in part by:

CSU's Undergraduate Research & Scholarly Activities Grant, \$300; Beta Beta Beta, \$500

Brain Response to Positive and Negative Emotional Salience

*Justin Kern
Savannah Donahue
David Chace Webb
Jessica Cheatham*

*Faculty mentors:
Dr. Kathakali Mitra-Varma
Dr. Mark Schmidt
Department of Psychology*

Prior research demonstrates correlations between time related electroencephalographic waveforms (EEG) and specific events in the brain. ERPs are most commonly used to detect which regions in the brain play a role in processing particular stimuli. Early research has also hypothesized that there is an early negativity and late positivity in the ERP wave for emotionally salient words. While research is currently available defining the difference experienced when processing words verses images, there are no studies exploring any difference in processing positively and negatively connotated words. We seek to rectify this. Independent variable conditions include one trial; the trial will consist of 30 positive words, 30 negative words, and 30 quadragrams. The words chosen for this experiment were derived from a 1999 study called Affective Norms for English Words The quadragrams are four letter nonsense words, designed to act as a control stimulus. Dependent variable measures consist of P300 wave response. The P300 wave is a positive wave reaching its maximum amplitude about 300 ms after stimulus onset. Upon the recognition of a stimulus there is a negative spike in the ERP wave followed by a reactionary positive wave. Historically, ERP readings have been used for such purposes such as lie detection, and it is speculated that the P3 wave is involved in decision making. Participants P300 waveform will be recorded with EEG readings of the parietal lobe and compared. Words will be presented on a computer screen, flashed independently once per session. The trial will consist of 90 words, which will appear for approximately 3 seconds per item. Identifiable words will be separated by nonsense quadragrams, in order to establish a baseline reading. Statistical data will be analyzed via a one way ANOVA, within subjects group design, and descriptive statistics will be computed in order to determine whether or not response to emotional salience differs between positive and negative connotation. The response variable will be the use of visual stimulus in order to obtain a response in the P300 waveform, and the explanatory variables will be the different connotations, as well as, the identifiable words vs. the unidentifiable quadragrams.

*Presented:
CSU Tower Day 2011*

This project was funded in part by: CSU Department Funds

Astronomy Outreach through Solar Research at the Coca-Cola Space Science Center

One of the main components of Columbus State University's Coca-Cola Space Science Center (CCSSC) is the Mead Observatory, which was established specifically for the purposes of reaching out to the community. Aside from supporting a mobile astronomy unit and webcasts that are viewed internationally, the observatory is dedicated during most daylight hours to a solar observing project that began in 2001. There are three parts to the work in the Solar Observatory: using the equipment, image processing, and public outreach. The observatory houses a Meade 16" LX 200 Schmidt Cassegrain Telescope, along with a computer set up to manage the operation of the telescope, CCD imaging cameras and video

devices to record observations, and the proper software to collect images. These images are then edited using either the computer in the observatory, computers at intern workstations at other locations within CCSSC, or personal computers. Although our image processing is constantly evolving, the current method relies heavily on the use of MaximDL software with some work in Registax and Photoshop. Our final images are then recorded in the Online Solar Archive, where they are available to the public. This archive was used as a basis to create the Solar Research Activity for the Georgian's Experience Astronomy Research in Schools (GEARS) project, and contributes to a program currently being developed called Real-time Interactive Solar Observing (RISO). RISO allows grade-school teachers to schedule online remote observing sessions during their class periods so that students can experience using a telescope first-hand. These programs allow the Mead Observatory to achieve astronomy outreach through the Solar Observing project.

Presented:

CSU Tower Day 2011

This project was funded in part by: A NASA Space Grant

Katherine Lodder

Eric Stephens

Matthew Perry

Faculty mentor:

Dr. Rosa Williams

*Department of Earth &
Space Science*

Comparison of the 2/27/10 Chile Earthquake with the 3/11/11 Japan Earthquake, and the Structure of the Earth's Interior

Laura Morris Significant research has been done using existing earthquake data to learn about how the interior of the Earth is structured. I have been working to correlate US Geological Survey's recorded data with data received at the Coca Cola Space Science Center (CCSSC) in order to compare the magnitude 8.8 earthquake on February 27, 2010 offshore Bio-Bio, Chile with the magnitude 9.0 earthquake on March 11, 2011 near Honshu, Japan. This Poster presented at CSU Tower Day 2011 will discuss the differences in the arrival times of both the primary and secondary waves at the CCSSC to infer some basic geologic properties of the regions in which each earthquake occurred. By comparing these findings to current research on the internal structure of the Earth, based on recorded apparent reflections off the core and shadow zones due to the inability of S-waves to pass through liquids, this seismic data adds to our growing understanding of the inner workings of our planet.

Faculty mentor:
Dr. Rosa Williams
Department of Earth &
Space Science

Presented:
CSU Tower Day 2011

This project was funded in part by:
CSU's Undergraduate Research & Scholarly Activities Grant & Departmental Funds, and A
NASA Space Grant, \$1500

Effects of Exercise on the Expression Levels of Matrix Metalloproteinase (MMP)- 23 in the Supraspinatus Tendons of Sprague-Dawley Rats

More than 95% of rotator cuff injuries are due to tears in the supraspinatus tendon. Matrix metalloproteinase (MMP) is a family of proteolytic proteins that degrade components of the extracellular matrix (ECM) network to facilitate tissue remodeling. Whereas MMP1 has been associated with tendon rupture, it is believed that the presence of MMP23 accelerates the degradation of tendon tissue. Currently, little is known about the role and functions of MMP23 in tendons. Thus the intent of this study is to help elucidate the role of MMP23 in rotator cuff injuries. This study examines the correlation between Matrix Metalloproteinase (MMP)-23 expression and the cellular arrangement of supraspinatus tendons of exercised and sedentary Sprague Dawley rats. Eighteen, 30-week old male Sprague Dawley rats are divided into two treatment groups: experimental and control. The experimental group is subjected to a 4-week exercise protocol designed to induce stress on the supraspinatus tendons, while the control group remain sedentary. After treatment, all rats will be humanely sacrificed and have their tendons excised. A quantitative analysis of MMP-23 expression on all excised tendons will be performed using Bio-Rad's Quantity One Software. Histological study will compare the degree of cellular rearrangement of the transected tendons. I hypothesize that an elevation in MMP23 expression, and changes in the cellular arrangement of supraspinatus tendons of the experimental group will be detected as compared to the control group. If my hypotheses are correct, MMP23 may be used as a molecular marker to identify individuals prone to tendinopathy. Understanding MMP-23 may allow the development of inhibitors to inhibit tendon degradation.

Tony Nguyen

Faculty Mentor:

Dr. Monica Frazier

Biology Department

Presented:

CSU Tower Day 2011

This project was funded in part by:

CSU's Undergraduate Research & Scholarly Activities Grant & Departmental Funds, \$300

The Making of "Pomp and Circumstances"

Danielle Thompson

This presentation will walk through the development of the presenter's short comedy film, *Pomp and Circumstances*, which was completed as her honors thesis. The story is about a college senior who is having the worst day ever, and it happens to be on one of the most important days in her young life – graduation day. The thesis project combines elements of film theory and practice, and overall it was an exercise in experiential learning, which the presenter hopes will encourage others to create practice-based and non-traditional undergraduate research projects. The thesis consisted of two parts: (1) the film itself, which is about 45 minutes in length, and (2) a written narrative consisting of research, reflection, interviews, journal entries, and materials from the various parts of the filmmaking process. During the entire school year, the presenter has researched and studied professional independent filmmaking techniques and has applied what she learned the production of her own film. The Tower Day presentation will give an overview of this experience and will relay how it extended the presenter's knowledge of filmmaking and prepared her for future projects. The presenter plans to show clips from the film and discuss how one may bring a creative vision into fruition on the screen. She will highlight particular learning experiences during the production and illustrate how technology and creativity blend in a project such as this. Ultimately, she wishes to share with others what goes into the production of a student film and explain how one can make the most out of limited resources in creating a film.

Faculty mentor:

Dr. Becky Becker

Department of English

Presented:

CSU Tower Day 2011

This project was funded in part by:

CSU's Undergraduate Research & Scholarly Activities Grant, \$255

Developing New Improved Indicators for the Acid-Base Volumetric Titrations

During the investigations on multi functional compounds for binding to multiple antiviral drugs, two interesting poly functional molecules (Bepa Red and Bepaxy Red) were designed and synthesized. First, Two tris(2-(hydroxymethyl)phenol) derivatives were synthesized as acid/base indicators. Reduction of 5,5',5''-(hydroxymethanetriyl)tris(2-hydroxybenzoic acid) in the presence of hydrogen (H₂) and palladium/charcoal afforded 5,5',5''-methanetriyltris(2-hydroxybenzoic acid) in 89% yield. Further reduction of this product with a borane solution in THF gave 4,4',4''-methanetriyltris(2-(hydroxymethyl)phenol) in 76% yield. Furthermore, 5,5',5''-(hydroxymethanetriyl)tris(2-hydroxybenzoate) was synthesized in 67% yield by the reaction of methyl salicylate and 1,3,5-trioxane in glacial acetic acid. Reduction of 5,5',5''-(hydroxymethanetriyl)tris(2-hydroxybenzoate) with a suspension of LiAlH₄ in THF produced 4,4',4''-(hydroxymethanetriyl)tris(2-(hydroxymethyl)phenol) in 70% yield. In conclusion: The acid/base volumetric titration of a standard solution of 1.0 M HCl with a standard solution of 1.0 M KOH using 4,4',4''-methanetriyltris(2-(hydroxymethyl)phenol) and 4,4',4''-(hydroxymethanetriyl)tris(2-(hydroxymethyl)phenol) as acid/base indicators showed a sharp color change from light orange to dark orange at pH= 5.46 and from dark red to bright pink at pH=7.32, respectively. These indicators may have potential improved applications for acid/base titration in a narrow range.

Taralynn Williams

Faculty mentor:

Dr. Yousef Ahmadi Beni

Department of Chemistry

Presented:

CSU Tower Day 2011

This project was funded in part by:

CSU's Undergraduate Research & Scholarly Activities Grant, \$600

Assessment of Heavy Metals in Lake Walter F. George in Alabama and Georgia

Samantha Worthy This study provided a comprehensive assessment of two heavy metals (chromium and cadmium) in twelve water samples. Nine of the water samples were taken from Lake Walter F. George and three were taken from tributaries emptying into Lake Walter F. George. Previous testing has shown levels of certain metals in Lake Walter F. George to exceed limits set by the Environmental Protection Agency (EPA). The EPA has recently set new limits on the amount of heavy metal that a body of fresh water can contain. Comparisons between heavy metal levels in collected water samples and levels in previous experiments were made. Concentrations of cadmium and chromium were measured using Graphite Furnace Atomic Absorption Spectroscopy (GF-AAS). The temperature programs were optimized for ashing and atomization stages. The entire analytical procedure was validated using standard reference material, SRM 1643e, Trace Elements in Water. Our findings were in good agreement with the certified values. The highest concentration of cadmium and chromium were found at sampling site 9, Lake State Park Eufaula (Alabama). The elemental concentrations of Cd and Cr measured in Lake Walter F. George water samples fulfill the Canadian and the US EPA guidelines for surface water quality.

Faculty mentor:
Dr. Samuel Abegaz
Department of Chemistry

Presented:
CSU Tower Day 2011

This project was funded in part by:
CSU's Undergraduate Research & Scholarly Activities Grant & CSU Department Funds, \$600

Forensic Analysis of Apple's Mobile Platforms

Computer crimes are increasing exponentially with the explosive growth of the Internet and the amount of digital technology that we use on a daily basis. With mobile technology growing rapidly so much so that we essentially have PC's in our pocket, the amount of general crimes involving technology is also growing. The goal of my research is to find out how evidence of such cyber crimes can be extracted with minimum data loss from Apple's classic iPod and iPod Touch/iPhone platforms. These devices are the most widely used mobile devices in modern society so my research will be used to show how these devices can be possibly used in criminal cases, how they may be used as evidence, and as well as serve as a benchmark for other modern mobile devices that are similar to the ones used in the research. The research was commenced by placing various types of files by different means onto the device such as regular PC syncing to downloading them using a WiFi connection. Using forensic analysis techniques and tools, information was obtained on how possible evidence (such as documents, pictures, and scripts) leave footprints on these systems, how they are able to be hidden and/or masked, and how evidence of cyber crime can be collected and from which parts of these systems the evidence comes from. The results of the research will benefit the fields of computer security and computer forensics by providing information on incidence response techniques of these fairly new technologies. The research will also benefit law enforcement by providing techniques of extracting evidence of crime from these technologies in a forensically sound manner.

Charles Yates

*Faculty mentor:
Dr. Lydia Ray
TSYS School of
Computer Science*

Presented:

CSU Tower Day 2011

This project was funded in part by:

CSU's Undergraduate Research & Scholarly Activities Grant, \$300

COMMUNITY PRESENTATIONS

Declotting of Central Lines in Hemodynamically Stable Patients

Eric Henderson Our team completed a systemic review of multiple medical
Mary Spong studies that compared the risk/benefit of the medication
Latravia Lewis Alteplase to break up clotted central venous catheters and
Maria Knight restore flow. Several studies compared the efficacy of
Kalema Cooper alteplase compared to heparin. With the evidence bases
research complete, our group formulated guidelines for
declotting central lines in the clinical setting of
hemodynamically
stable patients.

Faculty mentor:
Noreen McDonough
School of Nursing

Presented:
CSU Tower Day 2011
St. Francis, November 2010

Best Practices for Including Family Members During Procedures for Pediatric Patients

The purpose of our research was to determine the best practice regarding whether or not family members should be present during pediatric patient procedures and methods for including the family members. Although personal opinions varied within the group, once the research was examined, we determined that evidence based practice showed improved patient outcomes when family members were including during pediatric procedures. Our survey of the evidence showed that family presence during pediatric procedures results in reduced levels of anxiety for the patients, removes doubt and questions regarding the procedure being performed, creates a supporting environment for the patient as well as providing closure for the family during the grief process in the case of unsuccessful resuscitation. Based on the evidence found, we developed three broad guidelines for family member involvement as well as specific methods supported by research for including those family members. Our guideline states that family members should be given the option to be present during procedures for pediatric patients, however they may be excluded for certain disruptive behaviors. In addition, the number should be limited to 2 family members at a time and family members will accept a verbal agreement given by a Family Support Facilitator.

*Elizabeth Alexander
Stephanie Dias
Talisha Glenn
Tacara Hemingway
Rebekah Perkins
Jackie Winford*

*Faculty mentor:
Noreen McDonough
School of Nursing*

Presented:

CSU Tower Day 2011

Columbus Regional Medical Center, November 2010

Best Practices for Patients with Sickle Cell Disease in Vaso-Occlusive Crisis

*Monique Brooks
Sherine Hill
Glendese Lanier
Takelya White
Erica Williams
Bernice Wilson*

*Faculty mentor:
Ms. Leslie Painter
School of Nursing*

Sickle cell disease is an inherited autosomal recessive disease which is distinguished by an abnormal form of hemoglobin in the red blood cell. It is a disease that is said to affect over 100,000 people in the U.S. and the most effective treatment methods of the disease are still being researched today. Extensive research was conducted via various nursing databases and journal articles, in search for the best recommended practices on management of vaso-occlusive crisis in the sickle cell patient. It was discovered that the three methods of treatment that are still used today are: fluid replacement therapy, oxygen therapy, and opiod analgesics along with other non-steroidal pain relieving methods. The research findings were organized into an evidence synthesis table determining validity for the researched information. A guideline for vaso-occlusive treatment recommendations was constructed utilizing information from the research findings. A powerpoint presentation was also constructed to present the clinical findings. It was determined that there is still a substantial need for more research on methods to effectively treat vaso-occlusive crisis in the sickle cell patient. The sickle cell disease population is one that is often times under treated for the pain experienced during vaso-occlusive episodes. Comfort measures are often the only alternative measure for pain relief. The inclusion of performing thorough pain assessments and utilizing the best practices currently available will aid in providing adequate care for the sickle cell patient.

Presented:
CSU Tower Day 2011
Columbus Regional Medical Center, November 2010

Best Practice for Preventing Medication Errors

Medication errors are some of the most common medical errors made, harming millions of patient's each year and costing hospitals billions of dollars in recovery treatment. Medication errors can easily be prevented by implementing various measures to ensure such an event does not occur. Through thorough group research, we have found and developed 3 ways to help hospitals prevent medication errors which include: implementing interactive learning, use of a Bar Code System, and creating a "No Interruption Zone". Interactive learning in the hospital setting can be done by conducting in-service conferences upon orientation and bi-annually. These in-services reinforce the correct method of medication administration by providing examples of medication administration, identifying the errors, and then giving feedback. Next, the bar-coding system was created to assist in administration and help reduce misinterpretation of the physicians orders. Scanning the medications bar code ensures that the medication is going to the correct patient, is the correct amount, and that it is on the medication administration record. Finally, the "No-Interruption Zone" was created following the "cockpit rule" which is a component of all air travel. The "cockpit rule" prohibits communication during the most essential parts of flying - takeoff and landing. In the hospital setting, this rule can be used to eliminate unrelated conversation and activities during medication administration. There are several ways a "No-Interruption Zone" can be created such as the use of duct tape surrounding the medication carts, red mats, or red flashing lights. Also, the nurse can wear brightly colored sashes or vests when preparing or dispensing medications. In conclusion, through research, we as a group have found numerous methods that can reduce the prevalence of medication errors. All of the mentioned methods are both cost and time effective and could eventually eliminate medication errors all together.

*Jordan McKenzie
Kate Walton
KC MacEachren
Jill Lusher
Victoria Golden
Sarah Pateunade*

*Faculty mentor:
Mrs. Leslie Painter
School of Nursing*

Presented:

CSU Tower Day 2011

St. Francis Hospital, November 2010

Hourly Rounding

Crystal LeMarQuand
Alicia Orlich
Jessie Lindsey
Gretchen O'Donnell
Danielle Alvarado
Danielle Turner

Faculty mentor:
Dr. Sheri Noviello
School of Nursing

Hourly rounding will be performed by the nursing staff; this would be the charge nurse, primary nurse, and nurse tech. At first shift encounter the patient will be introduced to the members of their nursing staff, this includes writing names of the staff on the white board in the room. The staff will let the patient know that someone from the nursing staff will be checking on them every hour and will verbalize patient care plans for the day and ask for patient input. When hourly rounding is performed the primary nurse will be able to cluster their care by giving medications, turning, and assisting patients with anything they need at that time. This includes the 5 P's: Pain, assess the patient's pain levels using a pain-assessment scale, if the patient is in pain and a nurse tech is doing the rounding they would contact an RN immediately. Potty, offer toileting assistance. Phone, put the telephone within the patient's reach. Position, ask if they are comfortable or need to be repositioned. Prevention, in order to prevent injury check the siderails, ensure the bed is in the lowest position, place the bedside table, call light, and other requested items within the patient's reach. Prior to leaving the patient's room ask them if there is anything else you can do for them and assure them that someone from the nursing staff will be back to check on them in an hour.

Presented:
CSU Tower Day 2011, Outstanding Research & Creative Scholarship Award
St. Francis Hospital, November 2010

Best Practice for IV Insertion in Infants and Children

The purpose of our project was to determine the best method of reducing pain and anxiety in infants and children prior to inserting an IV. The significance of such a result would not only be a reduction in pain and anxiety in those receiving IV's, but also increasing success rates of IV insertions on the first attempt and conserving time, money, and resources. We utilized a PICO(T) style question and the CINAHL database for articles and research. We analyzed evidence-based practice from eight sources that involved efficacy and cost. We analyzed six interventions comparing them against each other and using nothing at all. We measured statistical significance using $p < 0.05$ as being statistically significant.

We arrived at the conclusion that Jet Lidocaine was the most effective means to increase IV insertion success rates, but using bacteriostatic normal saline for use in a saline wheel constituted the biggest "bang for the buck." A guideline procedure was developed that entailed the nurse checking the order, selecting an appropriate vein, disinfecting per hospital protocol, applying the numbing agent selected by the nurse and/or caregiver per hospital protocol, and finally inserting the IV per hospital protocol. A PowerPoint presentation and a references page were created.

*Darrell Mackenzie
Justin Banister
Michael Chamberlain
Jacob Chauvin
Eric Hall
Kirsten Joiner*

*Faculty mentors:
Dr. Cheryl Smith
Dr. Sheri Noviello
Ms. Noreen
McDonough
School of Nursing*

Presented:

CSU Tower Day 2011, Outstanding Research & Creative Scholarship Award
The Medical Center, November 2010

Best Practice of Hospitalization of Patients with a History of Alcohol Abuse

Elizabeth Smith
Ashley Edwards
Tina Nsanji
Jarielle Fluellen

Our group conducted research of four main methods of treating patients with a history of alcohol abuse. We researched pharmacologic methods used to prevent or treat delirium tremens or other withdrawal symptoms, screening for tuberculosis, alcohol assessment tools, and the importance of inpatient therapy and follow up therapy after being released from the hospital. Overall, we were attempting to recognize the best methods, or methods that can improve the treatment of patients with a history of alcohol abuse because the number of patients being seen in inpatient facilities for other comorbidities is on the rise, and health care staff need to understand how to properly treat these patients.

Faculty mentor:
Dr. Sheryl Smith
School of Nursing

Presented:
CSU Tower Day 2011
The Medical Center, December 2010

Best Practice for the Prevention of Postoperative Complications.

Using current evidence available in databases such as CINAHL, information on the best practice for preventing postoperative complications, specifically deep venous thrombosis and pneumonia, was synthesized into a practice guideline. This practice guideline outlines information obtained from 6 different studies. For the prevention of deep vein thrombosis, both graduated compression stockings and pneumatic compression devices are recommended, as well as use of both unfractionated heparin, as well as a low-molecular-weight-heparin as anticoagulant therapy. For the prevention of pneumonia it is recommended that operative patients be assessed preoperatively for risk factors of pulmonary complications. Those patients found to be at higher risk should receive lung expansion interventions, such as deep breathing exercises and incentive spirometry, both preoperatively and postoperatively. This practice guideline is an outline of the current best practice for preventing common postoperative complications that impede the recovery process and negatively effect patient outcomes.

*Kristen Smith
Newt Fisk
Mahogany Walker
Alyssa Morris
Stacie Freeman*

*Faculty mentor:
Dr. Cheryl Smith
School of Nursing*

Presented:

CSU Tower Day 2011
The Medical Center, November 2010

Chord Conundrum: Examining the Performance Practice of Polyphonic Figures in J.S. Bach's Solo Violin Works

Emily Vold Despite being composed nearly 300 years ago, the Sonatas and Partitas for Violin without Bass accompaniment by Johann Sebastian Bach (1685-1750) remain some of the most technically and stylistically challenging repertoire studied and performed by violinists today, in part because no record from the composer, apart from the manuscript score, exists detailing how to perform the works. One specific technical challenge is the execution of three and four-note chords in precise rhythmic accordance with Bach's notation. In this presentation, an analysis of musical conventions in the era referred to as the Baroque (1600-1750) shows that notation need not be followed strictly. Additionally, an examination of the violin and bow as developed by the 18th century, period treatises on musical performance, and the scores of the Sonatas and Partitas themselves reveal how Bach may have intended performers to execute these chords.

Faculty mentor:
Dr. Andrée Martin
Schwob School of Music

Presented:
CSU Tower Day 2011
RiverCenter for Performing Arts Colloquium, April 2011

PROJECTS PRESENTED AT TOWER DAY

Tower Day is an annual showcase for undergraduate research and creative endeavors sponsored by the Columbus State University's Honors Program. Undergraduates from all disciplines were invited to submit their proposals for presentations, posters and panel discussions. Those selected were invited to the day-long colloquium on April 12, 2011, which hosted 162 researchers presenting to an estimated audience of over 250.

During the event, undergraduate presenters were judged by a panel of faculty and honors students. Ten projects, including five presentations and five posters, were selected to receive Outstanding Research & Creative Scholarship Awards and recognized for their achievement at the annual Scholastic Honors Convocation. Those who have granted permission to print their abstracts are included in this publication.

Paranormal Beliefs and Personality

Courtney Bell Understanding personality, cognitive, and other characteristics associated with paranormal belief may help us better understand the differing levels of paranormal belief we observe across individuals. Tobacyk and Milford (1983) created a questionnaire of paranormal beliefs. In this research, we utilized the NEO-FFI personality inventory to assess for relationships between paranormal belief and personality. These paranormal beliefs used along with the Big Five (Neuroticism, Extraversion, Openness, Agreeableness, and Conscientiousness) can be used to try and understand the behavior of paranormal beliefs. We also assessed for difference in belief among ethnic / cultural groups in our sample.

Faculty mentor:
Dr. Harvey Richman
Department of
Psychology

Presented:
CSU Tower Day 2011

Rosalinda, Right: A Play

This short comedy explores what would happen if a normal college student was visited by a Shakespearean character invisible to everyone else. Rosalind, the protagonist from Shakespeare's "As You Like It" is re-imagined as a visitor to the 21st century. The play is an exercise in using a character created by another playwright; the Rosalind in "Rosalinda, Right" was designed to be true to Shakespeare's original character in "As You Like It." This was achieved through a thorough analysis of the "As You Like It" text. A firm grasp of blank verse was also necessary, and was acquired by studying a number of Shakespeare's plays. The play was written to be accessible and fun for both audiences without much exposure for Shakespeare, and for those familiar with his work.

Hannah Carey

*Faculty mentor:
Dr. Becky Becker
Department of Theatre*

Presented:
CSU Tower Day 2011

A House is Not a Home: Defeating Homelessness in Columbus

Randy Carpenter Our main goal in this Poster presented at CSU Tower Day
Briana Neves 2011 presentation is to discover how homelessness can be

solved in the Columbus community. Based on our research from scholarly articles and the information we have gathered from local homeless shelters, the primary contributing factors to homelessness in Columbus are unemployment, health, and substance abuse issues. Many homeless people are unaware of the amount of resources available; therefore, many of those resources have not been utilized to their full extent. Resources currently available to the homeless are shelters, spiritual guidance, prepared meals, health services, clothing donations, among others. The key to solving homelessness is not just by fulfilling the physical needs of the person, but by also acknowledging and aiding in the person's non-physical needs such as education, emotional well-being, and resources provided to help with employment. Thus, from this knowledge we are beginning to theorize many possible solutions that may help to alleviate the problem. For example, we believe that raising funds for computers in homeless shelters would provide more convenient resources for the homeless. Also, since many people are out of work, students at Columbus State University could volunteer their skills to job training. Examples of topics that could be dealt with in job training are resume building, cover letter writing, computer skills, interview tips (including but not limited to mock interviews and practice applications), and many more.

Faculty mentor:
Dr. Courtney George
Department of English

Presented:
CSU Tower Day 2011

Histology: Study of Tissues

Histology is the study of tissues. Columbus State University's Biology Department offers a senior and graduate level course in the identification, preparation, and physiology of tissues, BIOL 5515: Histology. Throughout the lecture portion of this course, we have learned the structure and function of the major types of tissues found in humans and other vertebrates. In lab, we have learned how to identify tissues and cells by light microscopy and also how to prepare tissues for various types of microscopy. Tissue samples go through a process of preparation before they can be mounted on a slide. Once the tissue is collected, it must be preserved, dehydrated, embedded in a preservative substance, such as paraffin wax, sliced into thin sections, de-paraffanized, and stained. Water is removed from the tissue through a dehydration process to prevent the cells from deteriorating and to make it compatible with paraffin. After dehydration, we embed the tissue in a melted paraffin wax mold and allow it to solidify. The next step is to slice the tissue embedded in a paraffin block using a microtome into 5 micrometer sections. The sections are placed on slides and then go through paraffin removal. We use xylene to remove the paraffin. The tissue on the slide is now ready to be stained. There are multiple types of stains that can be used to accentuate different aspects of certain tissues. The most common stain types are Hematoxylin and Eosin stain, Silver stain, Wright and Giemsa stain, and Osmium Tetroxide. Stains provide color and contrast for easier identification of specified organelles and cell types. Metallic stains allow for scanning and transmission electron microscopy to bombard the sample with electrons without destroying the tissue. Once the tissue has been properly stained, we attach a cover slip to the slide and it is ready to be viewed.

Benjamin Cupp

*Faculty mentor:
Mrs. Elizabeth Klar
Department of Biology*

Presented:

CSU Tower Day 2011

Preliminary X-Ray Analysis of the Internal Pulsar and Pulsar Wind Nebula in Supernova Remnant DEM L 241

Zachary Edwards The Supernova Remnant (SNR) DEM L 241 is located in the Large Magellanic Cloud (LMC), which is one of the Milky Way's neighboring galaxies, is of interest because of its internal Pulsar (PSR) and Pulsar Wind Nebula (PWN). The PSR and PWN in DEM L 241 are ideal for study because of their separation from each other and their relatively close location. Using CIAO software and data received from the Chandra X-Ray Space Observatory (Sequence Number 501508, Observation Id 12675) we will start a preliminary investigation of the PSR and Pulsar Wind Nebula PWN within DEM L 241. This preliminary study will give insight into the composition, overall structure of SNRs, PSR energy input, and PWN evolution.

Faculty mentor:
Dr. Rosa Williams
Department of Earth &
Space Science

Presented:
CSU Tower Day 2011, Outstanding Research & Creative Scholarship Award

Reactions to Interpersonal Offenses

The purpose of this study was investigate the influence of an offender's race on a victim's willingness to accept an apology and offer forgiveness following an interpersonal offense. Research on forgiveness has shown that apologies increase forgiveness. However, this can not be stated for all cases. For example, research has shown that an apology offered by a complete stranger may not be as effective as if the apology were coming from a close friend. In addition, research in Social Psychology has demonstrated that individuals display strong in-group biases, leading them to respond more favorably to individuals in their own group compared to those in the out-group. Based on this in-group bias, it is logical to conclude that apologies from an out-group member might be less effective. The current study combined these 2 lines of research (in-group bias and forgiveness) to examine the influence of an offender's race and the victim's level of prejudice on reactions to an interpersonal offense.

Ingrid Gamboa

*Faculty mentor:
Dr. April Phillips
Department of Psychology*

Presented:

CSU Tower Day 2011

Geologic Mapping at the Ashland-Wedowee and Dahlonega Gold Belts Juncture in NW Georgia

Jess Gilmer Rocks of the Ashland-Wedowee belt (AWB) in eastern Alabama and northwestern Georgia are made up of three stratigraphic units – the Ashland Supergroup, Wedowee Group, and Emuckfaw Formation – which have been metamorphosed to middle-upper amphibolites facies. These three units are dominated by micaceous schists of variable garnet and graphite content, interlayered with minor amphibolite and gneiss.

Faculty mentor:
Dr. Clinton Barineau
Department of Earth & Space
Science

Northeast of the AWB, and along strike of the Wedowee-Emuckfaw stratigraphy, lies the Dahlonega Gold belt (DGB) of northwestern Georgia and western North Carolina. The DGB is dominated by schists and metasandstones of the New Georgia Group (e.g. Otto Formation), but also contains some Ordovician mafic-ultramafic complexes (e.g. Pumpkinvine Creek Formation) interpreted as having formed in an arc or back-arc setting. While some workers have suggested that some rocks of the AWB are correlative with rocks of the DGB; others argue the two belts are separated by major thrust faults. Field mapping of the Bowden West and Graham 7.5' quadrangles were conducted to locate the proposed faults and determine if these rocks could be stratigraphically correlated. My research suggests that the garnet mica schists of the Wedowee Group can be mapped from the DGB into the AWB across the proposed fault. Stratigraphic correlation of rocks between the two belts indicates that Ordovician back-arc volcanic rocks of the DGB have been built on top of Laurentian rifted margin sediments of the AWB. This suggests that oceanic lithosphere was subducted beneath the Laurentian plate during the Ordovician, unlike in the Northern Appalachians where Laurentia was the subducting plate.

Presented:
CSU Tower Day 2011

Best Evidence Based Practices to Prevent Skin Breakdown in Obese Patients

The purpose of our project is to identify the best nursing practice for preventing skin breakdown in obese patients. During the presentation we will be discussing different interventions to help prevent skin breakdown. The different interventions include, pressure relief, proper nutrition, good hygiene practices, and completing a full risk assessment. We will also discuss the use of Ialuset cream and constant consultation with a wound care nurse as treatment interventions. As nurses we are always looking for the safest and most efficient way to provide the best care for our patients. We depend on evidence based research to improve the nursing profession and help our patients reach their optimal level of health.

*Meghan Gray
Katlyn Barr
Lauren Dumke
Quinnara Terry
Tina Shirley
Keiona Martin*

*Faculty mentor:
Dr. Sheri Noviello
School of Nursing*

Presented:
CSU Tower Day 2011

Best Practice for Pediatric Pain Assessment

*Kathryn Hamlett
Miya Leonard
Teresa Chancey
Diana Sanders
Domonique Dulin
Obiageli Moneke*

*Faculty mentor:
Dr. Cheryl Smith
School of Nursing*

The purpose of our research was to find the most current and best practice related to pediatric pain assessments. Our research showed that there are many different pain scales that could be used with pediatrics; however the Wong Baker face scale was the best for majority of the population. The Wong Baker faces are an arrangement of faces ranging from happy to sad faces, each displaying a number that can correlate the pain scale. The scale is ranked from 1 to 10, with 10 being the worst pain. The benefit of the face scale is that it provides pictures that children can relate to and point out which emotion they are feeling. Our research also revealed that pediatric pain is sometimes left untreated with the idea that the children will forget the painful experience. However, that is proven untrue, and it is very important for every member of the healthcare team to value and treat every child's pain score. In order to implement the pain scale into practice, our group suggested that a copy of the pain scale be posted on the wall in front of each patient's bed, ensuring that every patient and nurse could view the scale and get an accurate pain measurement. the group then recommended that each nurse wear a small version of the pain scale on their name tag in order to have one with them at all times. Our group provided these badge size scales for each nurse on the pediatric floor. Overall, the research and proposed practice is very feasible and could be easily implemented into any practice.

*Presented:
CSU Tower Day 2011*

Crucible Dramaturgy Project

Why is it that Miller's *The Crucible* still haunts audiences today? Is it the regrets of our past or the fear of our own, terrible potential as humans? Why did Miller choose the story of Salem's witch trials of 1692 when he did? Every theatrical work hopes to inspire poignant questions in its audience and to present images that they will never forget. Miller's choice of Salem's Witch Trials to compare with the HUAC hearings of the 1950's shows how far we have come as humans and as a nation, and yet how very little people have changed when faced with ignorance and fear. It is difficult to ignore the images set down in Miller's script: the girls in hysterical fits, the inflamed court scenes, the lust and suspicion

between otherwise good people, and the horrifying image of the gallows. Although Miller's play was not an immediate success when it first hit theaters, it has since become his most performed work. CSU's Department of Theater presented *The Crucible* November of 2010. To mediate between the world of Miller's play, Miller's own world, the reality of the Salem Witch Trials, and today's own forms of witch-hunts, I acted as dramaturge. I researched, collected, and presented information about Salem, about McCarthy Era politics, modern witch-hunts, and Arthur Miller. This information was used to solidify the world of the play for the actors and designers of the production, and was also used to create program notes, study guides, and a display of further information in the lobby during the production. The presentation, now, will cover a description of dramaturgical work, a discussion on my work as dramaturge for the CSU production, and continued research on potential productions. All with the hope of leaving those attending with a better idea of the work of a dramaturge and the CSU production of *The Crucible*.

Margaret Hoffman

*Faculty mentor:
Dr. Becky Becker
Department of Theatre*

Presented:

CSU Tower Day 2011, Outstanding Research & Creative Scholarship Award

Morphological Differences in Nervous Tissue Highlighted by Contrasting Histological Stains

Monica Junious Depending on the type of histological stain used, different structures in nervous tissue will stand out (stain better) than others. Nervous tissue is highly specialized, meaning that neurons have lost their ability to divide. However, a neuron contains a nucleus, which houses the genetic material (DNA).

Faculty mentor: Thus, an H&E stain of nervous tissue highlights the acidic nucleus (stains blue). Proteins found in neurons should stain orange, but they are difficult to see. A stain that will better highlight the presence of proteins found in nervous tissue is the silver stain. Because neurons synthesize hormones (some of which are peptides) and transport them through the cell for release during an action potential, it is believed that the entire neuron (and not just the nucleus) will stain strongly using a silver stain. A silver stain will also highlight the numerous support cells (glial cells) found in association with neurons in the nervous tissue. The final stain used, a PAS stain, will highlight the reticular fibers found in nervous tissue. The PAS stain also brings out any structures that contain carbohydrates, and it is believed that the astrocytes in the nervous tissue will be highlighted by the PAS stain due to their role in neuronal metabolism. Thus, each histological stain will highlight a different portion of the nervous tissue. It is not believed that there will be many morphological differences (on a microscopic level) when comparing the nervous tissue of humans with the nervous tissue of rats due to the relative similarity in the organizations of the two nervous systems.

Mrs. Klar
Department of Biology

Presented:
CSU Tower Day 2011

Texting in the Classroom

Twenty-two university students completed a reading comprehension task; 1. with a person in close proximity text messaging and 2. with the person in close proximity working quietly. Prior to the comprehension task, participants completed the extraversion scale of the NEO-FFI, which served both to mask the true purpose of the research (effect of text messaging) and as a second variable of interest. T tests indicated no difference between the texting and non-texting conditions. Results suggest that text-messaging does not disrupt reading comprehension of surrounding students. There was no interaction between testing condition and levels of extroversion.

*La'Sandra King
Elicia McRae*

*Faculty mentors:
Dr. Harvey Richman
Dr. Mark Schmidt
Department of
Psychology*

Presented:

CSU Tower Day 2011

Using Opaque Predicates to Obfuscate Metamorphic Malware

Rodrigo Sardinias There is an ever persistent race against the people who write malware and those that write the malware detection engines. One of the techniques malware employs today to evade malware detectors is called metamorphism. It is the ability of a program to transform itself into another program that looks different, while still keeping its functionality. In our research

Faculty mentor:
Dr. M. Radhouane we take a look at some of the techniques used by metamorphic
Chouchane malware, currently the most sophisticated form of malware.
TSYS School of Computer More specifically, we look at opaque predicates, and how they
Science are used to make it more difficult to determine whether a program is malicious, and how they can be used by a program to make variants of itself that, on the outside, appear to be different programs. We explain what an opaque predicate is, how to make a strong opaque predicate, how to use it, and how an opaque predicate can be used today for both good programs as well as malware. We then discuss our implementation of a metamorphic program that we are developing that behaves as metamorphic malware does. Our program automatically produces variants of itself, employing opaque predicates to make transformations to the control flow of the new program which make the variant appear to be a different program. Our main goal is to discover a property that is typical of all metamorphic malware, and to capitalize on our knowledge of this property to more efficiently detect metamorphic malware.

Presented:

CSU Tower Day 2011, Outstanding Research & Creative Scholarship Award

Are You Ready? Are We Ready? Am I Ready?

Many agree that students are not ready for college after they graduate from high school. Current statistics reveal that college dropout rates are high at colleges and universities across our nation. The specific purpose of our research study was to determine if some demographic factors of CSU students impact readiness for college. We studied the difference(s) between those who entered college upon graduating from high school and those who choose a career first and entered college later. We will discuss the variance in these students, such as economic levels (ability to pay for costs), socio level (rural, etc.), maturity (time management/skills, etc.), and life experiences (teenage v. senior citizen) as they enter university and how this affects their overall readiness for the academic experience. Many students entered college because it was the “thing to do” rather than being focused on specific goals in life or at college, thus, they experience confusion. CSU does help improve one’s readiness for college and to compete in our world. Our research addresses and highlights the various ways CSU enhances our readiness. Some but not all examples include the CSU ADA Office, the CSU Military Soldiers and Vets Office, the CSU Freshman Learning Classes, and the CSU Counseling Center. In summary, CSU has several programs, classes, and options to enhance readiness amongst students. In this presentation we hope parents, professors, and other students can learn from our struggles and experiences in our research presented by our panel. Readiness at an early stage is needed in all areas of life, college being no exception if we are to produce students who can successfully compete in the professional competitive market. Readiness leads to success at the university level that in turn, positively impacts students, their children, their future employees, and ultimately our country.

Presented:

CSU Tower Day 2011

*Elizabeth Weaver
Luke Mills
Melinda Goldman
Richard Highnote
Maria Pena
John Speaks
Lucas Velasquez*

*Faculty mentors:
Dr. Mary Kirchoff
Dr. Richard Baxte
Ms. Cathy Nail
Department of
Communication*

*Dr. Florence Wakoko
Department of
Criminal Justice and
Sociology*

Notes

[The following text is extremely faint and largely illegible. It appears to be a list of notes or a series of paragraphs, possibly containing names, dates, and descriptive text. The content is too light to transcribe accurately.]

[Faint text at the bottom right of the page, possibly a signature or a date.]

Submission to *Abstracts 2012*

Undergraduates at Columbus State University who engage in research, critique and scholarship during the academic year of 2011-12 are invited to publish an abstract of their work in next year's annual. Abstracts from all disciplines who have published or presented their work at local, regional, national or international conferences during the Summer 2011, Fall 2011, and Spring 2012 will be included.

Abstracts that are approved by faculty mentors may be submitted electronically at <http://honors.columbusstate.edu/abstracts.php>. Students interested in submitting are encouraged to visit the site to review the full list of information required when submitting their abstracts.





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