

UNC CHARLOTTE



**UNDERGRADUATE RESEARCH
CONFERENCE**

Friday, March 29, 2019

Barnhardt Student Activity Center

Conference Program



Welcome to the 2019 UNC Charlotte Undergraduate Research Conference (URC)! This is a special year for the conference as it is the inaugural year for UNC Charlotte's Office of Undergraduate Research (OUR). The Office of Undergraduate Research mission is to support undergraduate students through undergraduate research grants and opportunities to communicate their research to others through multiple research symposiums, funding to national conferences to present their research, and research exploration events. There are four formal sponsors for the conference: Academic Affairs, the Atkins Library, the Honors College, and the Levine Scholars Program. With this support, we are able to present a number of awards including the Community Engaged Research awards, Sustainability awards, Honors awards, as well as a number of Disciplinary Theme awards. Additionally, a special thank you goes to the Charlotte Research Institute for their continued support of the Atkins Library Research Awards.

The Undergraduate Research Conference would not be possible without the commitment of our UNC Charlotte faculty. The conference has a strong representation from faculty members who participate as research advisors, mentors, and judges. A big thank you to faculty for your service and dedication to undergraduate research and scholarship at UNC Charlotte. We would especially like to recognize the conference organizing committee, the Levine Scholars, and the staff in the Office of Undergraduate Research, all of whom played integral parts in the planning for today's event. Most of all please join us in congratulating our Undergraduate Researchers for their hard work and efforts. Now engage in the conference presentations, take pictures, and use the #NinerURC19 to share your URC moments on social media. At the end of the conference, please complete the URC 2019 Evaluation and Feedback form, which is located at this link: [2019 URC Evaluation](#).

Enjoy your day!

Dr. Erin Banks
Assistant Dean, Office of Undergraduate Research

Dr. Erik Jon Byker
Chair, URC 2019 Organizing Committee

UNC Charlotte URC 2019 Organizing Committee Members

Dr. Erin Banks, Assistant Dean, The Office of Undergraduate Research
Dr. Erik Jon Byker, Chair; Reading and Elementary Education, Cato College of Education
Dr. Aba Ebong, Electrical and Computer Engineering, William States Lee College of Engineering
Dr. Colleen Hammelman, Geography and Earth Science, College of Liberal Arts and Sciences
Dr. Diane Zablotsky, Director of the Levine Scholars Program
Ms. Jessica Robinson, Doctoral student, Cato College of Education
Dr. Leroy Wray, Program Coordinator, The Office of Undergraduate Research
Dr. Luke Donovan, Kinesiology, College of Health and Human Services
Dr. Malin Pereira, English and Executive Director of the Honors College
Mr. Ryan Harris, J. Murrey Atkins Library
Ms. Sarah Hedrick, Administrative Assistant, The Office of Undergraduate Research
Ms. Shamira Wright, Graduate assistant, The Office of Undergraduate Research
Ms. Sharon Reichard, J. Murrey Atkins Library
Dr. Tamara Johnson, Academic Planning and Analysis, Office of the Provost
Ms. Gabrielle Keaton, Undergraduate Assistant, The Office of Undergraduate Research
Levine Scholars: Ms. Annie Sung, Ms. Crista Cali, and Ms. Yara Mahmoud

URC 2019 Schedule of Events Friday, March 29, 2019

7:30 AM: Registration opens in the James H. Barnhardt Student Activity Center (SAC)

Students and judges arrive to register. The Salon rooms are open for students to set-up their PowerPoint presentations. A light, continental style breakfast is provided.

8:45 AM – 12:15 PM: Oral Presentations in the Salon Ballrooms

Judges and participants will follow the posted schedule and times for room assignments. Students must upload their presentation to their assigned Salon rooms by 8:30 AM.

- Salon A: Humanities
- Salon B: STEM: Biological Sciences
- Salon C: STEM: Physical Sciences
- Salon D: Health and Social Sciences
- Salon E: Arts, Communications, and Education

10:00 AM – 11:00 AM: Poster Session A

Poster session A presenters should register their poster between 9:00 AM – 9:45 AM. The judging will begin at 10:00 AM. Please stand next to your poster during the entire session time.

11:15 AM – 12:15 PM: Poster Session B

Poster session B presenters should register their poster between 10:30 AM – 11 AM. The judging will begin at 11:15 AM. Please stand next to your poster during the entire session time. At 12:10 PM, the presenters should start taking down their posters. Please fold up your presentation easel, as well, and place it on the floor next to where you presented.

12:30 PM – 1:30 PM: Student Panel and Awards Ceremony

- Introductory Remarks: Dr. Erin Banks and Dr. Erik Jon Byker
- Undergraduate Research Student Panel moderated by Dr. Heather Coffey
- Presentation of Disciplinary Theme Awards: Dr. Erik Jon Byker
- Presentation of Community Engagement Award: Dr. Tamara Johnson
- Presentation of Sustainability Awards: Dr. Diane Zablotsky
- Presentation of Honors College Awards: Dr. Malin Pereira, Executive Director of the Honors College
- Presentation of Atkins Library Research Awards: Dr. Anne Cooper Moore, Dean of Atkins Library

*At the conclusion of the Awards Ceremony, we asked that all winners remain in the Salons D & E for further instructions about group pictures. Much thanks to Wade Bruton for providing photography for URC 2019.

Salon A Oral Presentations: Humanities

8:45 AM: The Unattainable Body of the Female Child in Children's Literature:
How Adults Control Parameters
Kathleen Griffin
Abstract #115; Humanities
Faculty Advisor: Dr. Clayton Tarr, Department of English

9:00 AM: The Haunts in These Hills: The Cultural and Historical Power of the
Appalachian Ghost Story
Anne Wade **H**
Abstract #116; Humanities
Faculty Advisor: Dr. Aaron Shapiro, Department of History

9:15 AM: Huron Healing Amongst Jesuit Missionaries
Gabriela Cabrera **H, G**
Abstract #117; Humanities
Faculty Advisor: Dr. Carol Highman, Department of History

9:30 AM: Hanjungnok-Records Written in Silences
Teresa Lowenstein **G**
Abstract #118; Humanities
Faculty Advisor: Dr. Dan Du, Department of History

9:45 AM: Suffering after Genocide: Armenian Refugees from the Armenian Republic to Soviet Era
Hunter Mikels **H, G**
Abstract #119; Humanities
Faculty Advisor: Dr. Ella Fratantuono, Department of History

10:00 AM: A Comparative Analysis of the Effects of Critical Mass or Critical Actor Theory
Oluwatobi Kalejaiye **H, G**
Abstract #120; Humanities
Faculty Advisor: Dr. Beth Whitaker, Department of Political Science and Public Administration

10:15 AM: BREAK

10:25 AM: The Modern Metropolis of the Middle Class: The Impact of Victorian London's
Middle Class on the Built Environment
Gabrielle Briggs **H, G**
Abstract #121; Humanities
Faculty Advisor: Dr. Peter Thorsheim, Department of History

CE - Community Engaged
NC - North Carolina

G - Global
S - Sustainability

H - Honors
U - Charlotte

10:40 AM: Gandhi and British Suffrage: The Constitutional Recognition of Personhood
Natalie Mount **G**

Abstract #122; Humanities

Faculty Advisor: Dr. Ritika Prasad, Department of History

10:55 AM: The Lingering Impact of Reverse Course Policies on Japanese Politics and Democracy
Noah Corby **H, G**

Abstract #123; Humanities

Faculty Advisor: Dr. Maren Ehlers, Department of History

11:10 AM: Jonestown and the Forgotten

Alexandra Hemsley **H, G**

Abstract #124; Humanities

Faculty Advisor: Dr. Christopher Cameron, Department of History

11:25 AM: Foreign-Bound Protestantism: Women in the International Book Trade
Brittany Smith **G**

Abstract #125; Humanities

Faculty Advisor: Dr. Amanda Pipkin, Department of History

11:40 AM: Divine Intervention: A Study on the Non-Chalcedonian Viewpoint
of the Islamic Conquest

Avery Canfield **H, G**

Abstract #126; Humanities

Faculty Advisor: Dr. Robert McEachnie, Department of History

Salon B Oral Presentations: STEM ~ Biological Sciences

8:45 AM: Fibroblast Inflammasomes Promote Inflammation and Fibrosis in the Breast Tumor Microenvironment

Makenzie Postma **H**

Abstract #127; Science, Technology, and Engineering

Faculty Advisor: Dr. Didier Dréau, Department of Biological Sciences

9:00 AM: The Inflammatory Breast Tumor Microenvironment Promotes Angiogenesis

Seth Flynn **H**

Abstract #128; Science, Technology, and Engineering

Faculty Advisor: Dr. Didier Dréau, Department of Biological Sciences

Additional Author(s): Kristin Smoot

9:15 AM: Effects of Microbial Components on the Development and Survival of *Nematostella Vectensis*

Kendra Shaw **H**

Abstract #129; Science, Technology, and Engineering

Faculty Advisor: Dr. Adam Reitzel, Department of Biological Sciences

Additional Author(s): Molly Redmond

9:30 AM: The Fitness Cost of Antibiotic Resistance in Cystic Fibrosis B. Multivorans

Philip Badzuh **H, S**

Abstract #130; Science, Technology, and Engineering

Faculty Advisor: Dr. Todd Steck, Department of Biological Sciences

9:45 AM: Migratory Patterns of *Plasmodium Vivax* in Africa

Colton Cantley **H, G**

Abstract #131; Science, Technology, and Engineering

Faculty Advisor: Dr. Eugenia Lo, Department of Biological Sciences

Additional Author(s): Daniel Kepple

10:00 AM: In Vitro Enzymatic Synthesis of the Enterobacterial Common Antigen

Claire Gates **H**

Abstract #132; Science, Technology, and Engineering

Faculty Advisor: Dr. Jay Troutman, Department of Chemistry

Additional Author(s): Tim Wallen

CE - Community Engaged
NC - North Carolina

G - Global
S - Sustainability

H - Honors
U - Charlotte

10:15 AM: BREAK

10:25 AM: Genome-Wide Discovery of Regulatory Hotspots in the Coding Transcripts of Malaria Pathogen Plasmodium Falciparum

Diana Renteria Alvarez **H**

Abstract #133; Science, Technology, and Engineering

Faculty Advisor: Dr. Kausik Chakrabarti, Department of Biological Sciences

10:40 AM: The v-SNARES, Snc1, Snc2, and Gos1 Mediate Early Endosome Fusion in Yeast

Sarah-Catherine Paschall **H**

Abstract #134; Science, Technology, and Engineering

Faculty Advisor: Dr. Richard Chi, Department of Biological Sciences

10:55 AM: Metabolomic Dissection of Salt Tolerance in Wild Sweet Potato

Sherry Xiong **H, S, NC, U**

Abstract #135; Science, Technology, and Engineering

Faculty Advisor: Dr. Bao-Hua Song, Department of Biological Sciences

11:10 AM: Chemovirotherapy of Pancreatic Ductal Adenocarcinoma by Combining Oncolytic Vesicular Stomatitis Virus with FDA-approved Chemotherapeutic Drugs

Christopher Castagno

Abstract #136; Science, Technology, and Engineering

Faculty Advisor: Dr. Valery Grdzlishvili, Department of Biological Sciences

Additional Author(s): Christian Bressy, Gaith Drobj

11:25 AM: An Integrative Study of Marmot Responses to Ecotourism

Julia Nelson **H**

Abstract #137; Science, Technology, and Engineering

Faculty Advisor: Dr. Diane Zablotsky, Department of Gerontology

11:40 PM: Lyophilization and Stable Storage of Nucleic Acid Nanoparticles

Allison Tran **H**

Abstract #138; Science, Technology, and Engineering

Faculty Advisor: Dr. Kirill Afonin, Department of Biological Sciences

Additional Author(s): Justin Halman

CE - Community Engaged
NC - North Carolina

G - Global
S - Sustainability

H - Honors
U - Charlotte

Salon C Oral Presentations: STEM - Physical Sciences

8:45 AM: Adsorption Studies of a Novel Divalent, Dinuclear Copper Coordination Complex for Use in Supercapacitors

Matthew Bonfield **S**

Abstract #139; Science, Technology, and Engineering

Faculty Advisor: Dr. Jordan Poler, Department of Chemistry

Additional Author(s): Terawit Art Kongruengkit

9:00 AM: Fabrication of Carbon Nano Tube Electrode Systems for High Energy Storage Applications

Nickolas Zelenka **S**

Abstract #140; Science, Technology, and Engineering

Faculty Advisor: Dr. Jordan Poler, Department of Chemistry

9:15 AM: Sustainable Purification of NanoResin Functionalization

Rabia Sheikh **S**

Abstract #141; Science, Technology, and Engineering

Faculty Advisor: Dr. Jordan Poler, Department of Chemistry

Additional Author(s): Nicolas Johnson, Abhispa Sah, Kayla Durkin

9:30 AM: Synthesis and Reactivity of Expanded-Ring Heterocyclic Selones

Keri Dowling

Abstract #142; Science, Technology, and Engineering

Faculty Advisor: Dr. Daniel Rabinovich, Department of Chemistry

9:45 AM: Optical Vibration Imaging for Condition Monitoring

Taylor Ballard **NC**

Abstract #143; Science, Technology, and Engineering

Faculty Advisor: Dr. Tony Cinson, Department of Mechanical Engineering

10:00 AM: Structural Studies of the Sleeping Beauty Transposase

Chenbo Yan

Abstract #144; Science, Technology, and Engineering

Faculty Advisor: Dr. Irina Nesmelova, Department of Physics and Optical Science

Additional Author(s): Gage O. Leighton, Rosario I. Corona, Jun-Tao Guo

CE - Community Engaged
NC - North Carolina

G - Global
S - Sustainability

H - Honors
U - Charlotte

10:15 AM: BREAK

10:25 AM: One-dimensional Omnidirectional Etalons in Optical Fibers

Joseph Obeid

Abstract #145; Science, Technology, and Engineering

Faculty Advisor: Dr. Tsing-Hua Her, Department of Physics and Optical Science

10:40 AM: Understanding the Mechanism of the Fluorescence of Gold-thiol Complexes

Gabriel Palermo

Abstract #146; Science, Technology, and Engineering

Faculty Advisor: Dr. Shunji Egusa, Department of Physics and Optical Science

10:55 AM: Verifying a Volume Hysteresis Effect in Many Ternary Solutions to
Computationally Measure the Glass Transition Concentration

Austin Bloom

Abstract #147; Science, Technology, and Engineering

Faculty Advisor: Dr. Donald Jacobs, Department of Physics and Optical Science

Salon D Oral Presentations: Health and Social Sciences

8:45 AM: An Evaluation of Health Literacy in Parents Having Children with Disabilities

Margaret Johnson **G**

Abstract #107; Health Sciences

Faculty Advisor: Dr. Margaret MacKay, School of Nursing

9:00 AM: Perceived Gynecological Needs among Muslim Women in Charlotte

Sondous Eksheir **CE, NC, U**

Abstract #108; Health Sciences

Faculty Advisor: Dr. Jessamyn Bowling, Department of Public Health Sciences

9:15 AM: The Interconnectivity of Culture and the Psyche: Examining South Africa

Melissa Martin **G, H**

Abstract #109; Health Sciences

Faculty Advisor: Dr. Heather Smith, Department of Geography and Earth Sciences

9:30 AM: Effects of OTC Bleaching Treatments on Enamel

Elizabeth Kay **H**

Abstract #110; Health Sciences

Faculty Advisor: Dr. John Risley, Department of Chemistry

9:45 AM: Childhood Nutrition in Underprivileged Socioeconomic Groups: A Comparison
Between The United States and South Africa

Sarah Mullen **G, H**

Abstract #111; Health Sciences

Faculty Advisor: Dr. Diane Zablotzky, Department of Sociology

10:00 AM: Postpartum Depression Screening and Referrals in WIC Clinics

Sreevidhya Balasubramanian **CE, H, NC, S, U**

Abstract #112; Health Sciences

Faculty Advisor: Dr. Maren Coffman, Department of Public Health

10:15 AM: BREAK

10:25 AM: Are Single- Payer Systems Producing Superior Health Outcomes?

Sarah Hicks **CE, G**

Abstract #113; Health Sciences

Faculty Advisor: Dr. David Dalton, Department of Culture and Language Studies

CE - Community Engaged
NC - North Carolina

G - Global
S - Sustainability

H - Honors
U - Charlotte

10:40 AM: Statistical Analysis of Health Care Spending in the United States
Avery Johnson **G, H**
Abstract #114; Mathematics and Computer Sciences
Faculty Advisor: Dr. Qingning Zhou, Department of Mathematics and Statistics

10:55 AM: Causes and Current Intervention Methods of Gender-Based
Violence in South Africa and the United States
Andrea Badillo-Pérez **G, H**
Abstract #151; Social Sciences
Faculty Advisor: Dr. Diane Zablotsky, Department of Sociology

11:10 AM: The Association of Depression and Alcohol Use in Social Media among Women from
Underrepresented Minority Groups
Brittany Cobb **H**
Abstract #152; Social Sciences
Faculty Advisor: Dr. Erika Montanaro, Department of Psychological Science

Salon E Oral Presentations: Arts, Communication, Education and Social Sciences

8:45 AM: Inquiry into the Arts: Panel Discussion

Faustina Edwin, Allison Cummings, and Chloe Nicola **G, H**

Abstract #100; Arts and Design

Faculty Advisor: Dr. Malin Pereira, Honors College

9:00 AM: Art as a Conservation Tactic

Kerrington Maner **G, H**

Abstract #101; Arts and Design

Faculty Advisor: Dr. Malin Pereira, Honors College

9:15 AM: Improving the Outcome of the ePortfolio Requirement in CxC: Panel Discussion

Kadijah Holder, Alicia LaLoggia, Laura Staton, and Emily Tiehen

Abstract #102; Education

Faculty Advisor: Dr. Heather Bastian, Communication Across the Curriculum

9:30 AM: Carolinians in The Margins: The Systematic Cover-Up of Difficult History in North

Carolina Textbooks, 1950-2016

Susanna Olson **H, NC, U**

Abstract #103; Education

Faculty Advisor: Dr. Shepherd McKinley, Department of History

9:45 AM: Investigating the Factors that Influence Males to become Elementary Teachers

Nafis Muhammad **H, NC, U**

Abstract #104; Education

Faculty Advisor: Dr. Erik Jon Byker, Department of Reading and Elementary Education

10:00 AM: Factors That Influence Student and Family Perspectives on the Social Interactions of

Students Who Are Deaf in General Education Settings

Cameron Brophy **H**

Abstract #105; Education

Faculty Advisor: Dr. Shawnee Wakeman, Department of Special Education

CE - Community Engaged
NC - North Carolina

G - Global
S - Sustainability

H - Honors
U - Charlotte

10:15 AM: BREAK

10:25 AM: Building Classroom Rapport: How Teacher and Student Gender Roles Influence Communication

Corinne Rigordaeva

Abstract #106; Education

Faculty Advisor: Dr. Meghan Barnes, Department of English

10:40 AM: Communication: Male and Female Professors in the Classroom and Its Effects on Students

Charity Clark

Abstract #149; Social Sciences

Faculty Advisor: Dr. Meghan Barnes, Department of English

10:55 AM: Does the Caseload of Youth and Family Services Workers affect their Work Performance?

Thomasina Pearce **CE, H, NC, U**

Abstract #150; Social Sciences

Faculty Advisor: Dr. Annelise Mennicke, Department of Social Work

ABSTRACTS

Oral Presentations

CE-Community Engaged
NC-North Carolina

G-Global
S-Sustainability

H-Honors
U-Charlotte

Arts and Design

CE-Community Engaged
NC-North Carolina

G-Global
S-Sustainability

H-Honors
U-Charlotte

Abstract #100; Arts and Design

Title: Inquiry into the Arts: Panel Discussion

Student Author(s): Faustina Edwin, Allison Cummings, and Chloe Nicola **G, H**

Faculty Mentor: Dr. Malin Pereira, Honors College

Our research is an inquiry to the Arts. We have attended various different forms of art and we have deeply learned about the nature of each form. Our intent is to change the stereotype on classical and even contemporary art through our findings. For example, the style of African prints has recently become a popular fashion trend worldwide, appearing on runways both in Africa and the western world. The Mint Museum exhibition "African-Print Fashion Now!" demonstrates that African-prints are certainly a global phenomenon; they are produced in Africa, Europe, and Asia and purchased across the world. Specifically in Nigeria, several women have gained international recognition for their designs. However, the general effects of colonialism and the importation of cheaper Chinese textiles have harmed the overall growth of African-print industry in Nigeria.

CE-Community Engaged
NC-North Carolina

G-Global
S-Sustainability

H-Honors
U-Charlotte

Abstract #101; Arts and Design

Title: Art as a Conservation Tactic

Student Author(s): Kerrington Maner **G, H**

Faculty Advisor: Dr. Malin Pereira, Honors College

Works of art like the cinematic masterpiece *Jaws* (1975), Anne Lemanski's sculpture *Impala* (2015) and paintings created by animals in zoos and aquariums worldwide serve as tools that aid in the furtherance of public education about wildlife conservation. While *Jaws* initially struck a chord of fear in the hearts of moviegoers across America, it sparked the flame of a shark conservation movement that has yet to be extinguished. Lemanski's *Impala* brings her audience up-close to a common African bovid that few will encounter in the wild while spreading a message of conservation about this creature and others. In similar ways, zoos and aquariums use paintings created by resident animals as educational talking-points and fundraising items. Considering these examples in more detail, it is evident the efficacy with which art, in its many forms, serves as an effective worldwide wildlife conservation tool.

Education

CE-Community Engaged
NC-North Carolina

G-Global
S-Sustainability

H-Honors
U-Charlotte

Abstract #102; Education

Title: Improving the Outcome of the ePortfolio Requirement in CxC: Panel Discussion

Student Author(s): Kadajah Holder, Alicia LaLoggia, Laura Staton, and Emily Tiehen

Faculty Advisor: Dr. Heather Bastian

Department: Communication Across the Curriculum

Research has found that ePortfolios are an effective tool for supporting student learning. As such, ePortfolios are a popular practice in educational settings, including the Communication Across the Curriculum (CxC) program at UNC Charlotte. CxC trains peer communication consultants to provide one-on-one support to students within select classes to assist with the development of their communication competencies. One element of their training includes a required ePortfolio in which they are asked to articulate the benefits of their role within CxC and to illustrate the development of their own communication competencies. This applied research study investigates ways in which the ePortfolio component of consultant training can be strengthened and connected to the overall consultant experience. Consultant surveys results from Spring 2018 and Fall 2018 were reviewed to identify and categorize direct feedback on ePortfolios. Additionally, open-ended questions on the surveys were coded to identify what consultants report as positive and meaningful aspects of their experiences. Finally, ePortfolio practices in similar organizations in which ePortfolios are found to be successful were reviewed. Findings suggest ways in which the ePortfolio requirement can be improved so that consultants can connect the ePortfolio to their work with peers and their own development.

Abstract #103; Education

Title: Carolinians in The Margins: The Systematic Cover-Up of Difficult History in North Carolina

Textbooks, 1950-2016

Student Author(s): Susanna Olson **H, NC, U**

Faculty Advisor: Dr. Shepherd McKinley

Department: History

This paper presents a critical analysis of 8th grade textbooks to explore how North Carolina public schools have taught racial conflict between 1950-2016. This paper adopts the case study approach to trace how textbooks frame two controversial conflicts, the Tuscarora War and the “Wilmington Race Riot.” This paper finds that although textbook authors have significantly improved the language and frequency of representations of minorities, these improvements are inadequate. North Carolina’s textbooks from 1950 to the mid-1980s featured overtly racist value-judgements. Since the 1980s, textbook publishers avoid the subject of racial conflict and delegate African American and Native American history to the margins of their textbooks. In the interest of presenting history to eighth graders that emphasizes continuous progress and the growth of freedom, state-adopted textbooks ignore racial conflict and unflattering history. These cleaned-up histories perpetuate stereotypes and transmit an unequal social system to the next generation. The permanence of this racist framework leaves little room for students to consider, question, or critique the long-term effects of difficult history on the development of North Carolina.

Abstract #104; Education

Title: Investigating the Factors that Influence Males to become Elementary Teachers

Student Author(s): Nafis Muhammad **H, NC, U**

Faculty Advisor: Dr. Erik Jon Byker

Department: Reading and Elementary Education

The purpose of my Honors Thesis is to examine and report of why males decide to become elementary school teachers. The study investigates the factors for why men choose to become and stay as elementary school teachers. There is a lack of male teachers in elementary schools in the United States, this study, though, seeks to identify why men who choose to go into elementary education field decide to do so despite of the low status and many of the social pressures about men as elementary school teachers. The study is framed by the Key Expectancy–Value theoretical framework (Wigfield & Eccles, 1992). The Expectancy-Value theoretical framework asserts that values and ability beliefs--or the expectancies for a successful life--are the most influential predictors for academic and career choices (Watt & Richardson, 2007). Using the lens of the Key Expectancy–Value theoretical framework, the study uses a mixed-methodology research design (Creswell, 2014) to examine the following research questions: (1) What are the factors that influence a male to pursue a career in elementary education? and (2) How, if in any way, do the reasons men become male elementary teachers vary based on variables like whether the participant is a preservice teacher or a practicing teacher? I used a mixed-methods research design to investigate these questions with a total of 32 participants (n=32). I found that two value components--the Intrinsic Career Value and the Social Utility Value--of the Key Expectancy–Value theoretical framework had the greatest amount of influence in why the male participants in this study chose to pursue a career as an elementary school teacher. I also found that the male participants chose potential impact of children’s lives and enjoyment of working with children as most important when deciding to pursue a career as an elementary teacher.

Abstract #105; Education

Title: Factors That Influence Student and Family Perspectives on the Social Interactions of
Students Who Are Deaf in General Education Settings

Student Author(s): Cameron Brophy **H**

Faculty Advisor: Dr. Shawnee Wakeman

Department: Special Education

This paper discusses results from a case study that investigated student and family perspectives of an elementary-aged deaf student in a general education setting. The results showed that there were several factors that influenced these perspectives and the social experiences of the deaf student participant. These factors were a) family and parental involvement, b) self-advocacy skills, c) support from school staff, and d) rich interactions with peers. Data was collected through interviews with the student and his parent followed by three separate observations in order to compare data from the interviews. The student and parent discussed the student's social interactions and experiences in a semi-structured interview format. From the interviews, it was clear that the student and his parent had a positive perspective of the student's social interactions in the general education classroom. This was confirmed in the observations of the student at school.

Abstract #106; Education

Title: Building Classroom Rapport: How Teacher and Student Gender

Roles Influence Communication

Student Author(s): Corinne Rigordaeva

Faculty Advisor: Dr. Meghan Barnes

Department: English

The purpose of this research is to identify areas in the classroom where female English Language Arts teachers establish rapport with their male and female students and what types of rapport are established during this process. Concepts from Montgomery's (2010), *An Introduction to Language and Society* are drawn upon to foster an understanding of how teachers and students are influenced by language and gender roles while communicating in the classroom. Coming from a preservice English teaching background, the data from this research paper is directly transcribed from a high school ELA classroom setting I was able to analyze throughout clinical hour observations. This classroom data is used to examine how a female teacher can connect with her students in order to elicit an engaged response.

Health Sciences

CE-Community Engaged
NC-North Carolina

G-Global
S-Sustainability

H-Honors
U-Charlotte

Abstract #107; Health Sciences

Title: An Evaluation of Health Literacy in Parents Having Children with Disabilities

Student Author(s): Margaret Johnson **G**

Faculty Advisor: Dr. Margaret MacKay

Department: School of Nursing

India recently increased government support for children with disabilities, but many families do not utilize these services adequately. In New Delhi, over the next year, I aim to analyze health literacy's role in this issue by conducting observations and evaluations of parents having children with disabilities. My research will provide the parents' view of the current systems and reveal barriers. I plan to use this research to promote the development of family-centered programs.

CE-Community Engaged
NC-North Carolina

G-Global
S-Sustainability

H-Honors
U-Charlotte

Abstract #108; Health Sciences

Title: Perceived Gynecological Needs among Muslim Women in Charlotte

Student Author(s): Sondous Eksheir **CE, NC, U**

Faculty Advisor: Dr. Jessamyn Bowling

Department: Public Health Sciences

The sexual and reproductive health needs of Muslim women in the U.S. is understudied in research. Past studies suggests American Muslim women have lower breast cancer screening rates as compared to the general U.S. population of women in the same demographic. This project uses community-based approaches in partnership with Shifa Clinic, a low-income clinic focusing on Muslim populations in Charlotte, NC. This is a multi-method study consisting of online surveys (n=79) and in-person interviews (n=15) to assess Muslim women's experiences in regards to their reproductive health. Surveys were facilitated using Qualtrics, and results were analyzed by descriptive statistical analyses using SPSS. Interviews were audio-recorded, transcribed, and thematically analyzed using Dedoose online software, with each interview coded by two trained coders. Survey analyses show low screening rates for cervical cancer and sexually transmitted infections, as well as moderate use of contraception. Interview participants reported the significance of education in distinguishing between religious and cultural values as related to sexual health. In order to address the need for reproductive health education in this context, it is highly suggested to have more resources available for Muslim women in Charlotte such as confidential peer programs, well-planned youth groups, and educational workshops by health professionals.

CE - Community Engaged
NC - North Carolina

G - Global
S - Sustainability

H - Honors
U - Charlotte

Abstract #109; Health Sciences

Title: The Interconnectivity of Culture and the Psyche: Examining South Africa

Student Author(s): Melissa Martin **G, H**

Faculty Advisor: Dr. Heather Smith

Department: Geography and Earth Sciences

The interconnectivity of culture and the psyche – that is, the ways in which culture influence how people think about themselves and the world – is widely accepted in literature (e.g. Oyserman & Lee, n.d.; Triandis, 1996). Culture’s influence on abnormal thought and mental health on the other hand is less widely reported. South Africa, with its cultural diversity, clear cultural divisions, and climate of cultural change provides an engaging context through which to explore culture’s influence on mental health. Specifically, explorations of psychological resources available in South Africa and how aspects of culture, such as political history and language, influence the availability of said resources sheds light on the complexity of the relationship between culture and mental health.

CE-Community Engaged
NC-North Carolina

G-Global
S-Sustainability

H-Honors
U-Charlotte

Abstract #110; Health Sciences

Title: Effects of OTC Bleaching Treatments on Enamel

Student Author(s); Elizabeth Kay **H**

Faculty Advisor: Dr. John Risley

Department: Chemistry

Dental enamel is the hardest mammalian tissue and serves as the outer protective layer of the tooth. It is formed through biomineralization by a type of epithelial cell called the ameloblast. The inner enamel consists of hydroxyapatite (HA) crystals that are a more mineralized form of ameloblasts. Removal of, or damage to, the enamel is collectively called demineralization, which is irreversible and makes the tooth susceptible to damage over time. Tooth discoloration and staining are very common cosmetic dental concerns. Common and cost-effective treatments for tooth discoloration and staining are over-the-counter (OTC) dental whitening kits. The bleaching agents found in whitening kits are usually oxidizing agents, the most common being hydrogen peroxide (HP). Although bleaching agents are successful at lightening tooth color, their effects on the integrity and composition of teeth have often been called into question. Herein, the effects of whitening gels on enamel are reviewed. Through the reformulation of bleaching agents to include 15% carbamide peroxide, along with fluoride and calcium phosphate microspheres, and the development of new methodologies to measure the extent of tooth demineralization, OTC bleaching treatments are being improved upon to reduce the amount of demineralization, while still whitening teeth.

Abstract #111; Health Sciences

Title: Childhood Nutrition in Underprivileged Socioeconomic Groups: A Comparison Between
The United States and South Africa

Student Author(s): Sarah Mullen **G, H**

Faculty Advisor: Dr. Diane Zablotsky

Department: Sociology

Childhood nutrition is one of the most formative aspects of human growth, development, and success. The inadequacy in children's diets is visible globally especially in underprivileged socioeconomic groups, and is evidenced in diverse ways based on the country. Presented is a literature review including primary research exploring the intricacies of childhood nutrition in South Africa as compared to the United States. While micronutrient deficiencies are prevalent in both populations, sociocultural differences produce varying manifestations of this epidemic, such as in the form of rising numbers of obesity predominantly in the U.S. or increasing cases of stunting and wasting in nearly 27% of South African children. These various nutritional inadequacies can be tied to calories, protein, vitamins, minerals, and even liquid intake. Exploring this lack of nutrition in a child's life requires delving into the years far before primary school begin. Studies consistently prove that the first two years in a child's life are the most critical in determining future developmental success physically and mentally. As a result, a mother's prenatal health choices, and subsequently the decision to provide formula or breast milk to her infant has some of the most long-lasting effects on her baby. Current studies show that roughly 75% of American mothers breastfeed as opposed to the 25% in South Africa which can be linked to the high HIV rates and doctor recommendations. As these children age, the negative impacts that arise from being raised in food-insufficient homes can be seen in many situations. They lack knowledge about healthy foods, have been conditioned to prefer processed foods, and out of embarrassment may decline free food. In addition to exploring the factors contributing to childhood malnutrition, this project also examines suggested solutions to solve this problem and attempt to end the cycle of poverty that this childhood malnutrition reinforces.

CE - Community Engaged
NC - North Carolina

G - Global
S - Sustainability

H - Honors
U - Charlotte

Abstract #112; Health Sciences

Title: Postpartum Depression Screening and Referrals in WIC Clinics

Student Author(s): Sreevidhya Balasubramanian **CE, H, NC, S, U**

Faculty Advisor: Dr. Maren Coffman

Department: Public Health

Postpartum depression (PPD) is a mood disorder that affects as many as 1 in 7 women following childbirth. Identifying and facilitating treatment is challenging in lower-income and ethnically diverse women. The Special Supplemental Nutrition Program for Women, Infant, and Children (WIC) clinics are an ideal setting to reach this population and conduct screenings. The aims of this study were to: 1) screen women with infants for PPD in WIC clinics and model the odds of a positive depression score, 2) evaluate the effectiveness of referring women with PPD to a case management program, and 3) assess policy, practice, and treatment issues using focus groups. Women with infants visiting WIC clinics (N = 302) were screened for depression using the Patient Health Questionnaire (PHQ)-2. Women who were Hispanic, had no health insurance, and had limited support caring for the infant were more likely to report depression symptoms. Women with scores ≥ 2 were asked to complete the PHQ-9 and Edinburgh Postnatal Depression Scale (EPDS; n = 73). Women were referred for case management services if they had symptoms of depression and consented to the referral (n = 19). After one month, a report provided by the case manager was assessed for outcomes. Four focus groups identified themes at the individual, local, and system level. The study demonstrates the need to screen women at risk for PPD, facilitate access to behavioral health services, and advocate for policy and practice changes.

CE - Community Engaged
NC - North Carolina

G - Global
S - Sustainability

H - Honors
U - Charlotte

Abstract #113; Health Sciences

Title: Are Single- Payer Systems Producing Superior Health Outcomes?

Student Author(s): Sarah Hicks **CE, G**

Faculty Advisor: Dr. David Dalton

Department: Culture and Language Studies

Universal Health Care has become a highly debated topic in recent years. Many societies are faced with deciding whether healthcare should be a government-controlled entitlement available to the general public and paid for with tax dollars, or if people have the responsibility to determine and manage their own healthcare and quality of life per their own needs, or desires.¹ Universal health care systems are becoming increasingly more popular (Amadeo 1); however, the United States of America tends to stick with its own one-of-a-kind, hybrid health care system, year after year. The debate has now come to which health care system, a one-of-a-kind system like the United States, or a universal system as in Costa Rica, is producing the superior healthcare outcomes?

CE-Community Engaged
NC-North Carolina

G-Global
S-Sustainability

H-Honors
U-Charlotte

Humanities

CE-Community Engaged
NC-North Carolina

G-Global
S-Sustainability

H-Honors
U-Charlotte

Abstract #115; Humanities

Title: The Unattainable Body of the Female Child in Children's Literature:

How Adults Control Parameters

Student Author(s): Kathleen Griffin

Faculty Advisor: Dr. Clayton Tarr

Department: English

Alice's Adventures in Wonderland and The Secret Garden are both iconic children's novels. In both novels, the main characters are young women whose sizes are constantly remarked on. While Alice is in a fantasy land and can return to being a little girl, Mary's story takes place in the real world and cannot escape her own reality. It is even arguable that her story is taken over by Colin and his story making her story and body more irrelevant than hers. This research project will explore the differences that thirty years makes and whether society has become less critical or more critical of little girls.

Abstract #116; Humanities

Title: The Haunts in These Hills: The Cultural and Historical Power of the
Appalachian Ghost Story

Student Author(s): Anne Wade **H**

Faculty Advisor: Dr. Aaron Shapiro

Department: History

Everyone has, at some point in their lives, heard a ghost story. Whether the story was a silly one—like a ghost that “haunted” a school bathroom—or whether it was more serious—like the ghosts that haunt a Civil War battlefield—everyone has heard a ghost story. The question then becomes; why? Why are ghost stories so pervasive, so loved, and so interesting to audiences both modern and ancient? This project asserts that the answer to this question lies in the culture and history of a region itself. This project focuses, specifically, on the ghost stories of a region that is called “Appalachia,” which is located in the Eastern United States within the Appalachian Mountain Range. It asserts that these ghost stories play a very important role in the way that the people of Appalachia think about themselves and their place in history and illustrates the way that these unique people pass on their histories from one generation to the next. Additionally, it asserts that these ghost stories are not just drivel. They are, instead, indicators of a greater story and a larger history.

CE - Community Engaged
NC - North Carolina

G - Global
S - Sustainability

H - Honors
U - Charlotte

Abstract #117; Humanities

Title: Huron Healing Amongst Jesuit Missionaries

Student Author(s): Gabriela Cabrera **G, H**

Faculty Advisor: Dr. Carol Highman

Department: History

This thesis focuses on the less discussed, but equally important, matter of influence of Huron medicine on European culture in the New World. Thus, helping French navigate an unfamiliar and difficult environment. The way in which the Jesuit are strictly discussed in terms of their contribution and influence to outside players exclude the important discussion of how the Jesuits themselves changed. Their expansive missionary activity, including their avid attempts to adhere to whatever culture they were intruding on, absolutely made their marks on Jesuit society, shifting and remodeling from place to place. Taking aspects of different groups like the Huron, and incorporating enhancing characteristics that worked out to the Jesuit advantage. Their religion undoubtedly changed, however, it would be naive to think it only changed in terms of political or economic advantages. Somewhere within the Jesuit mission amongst the Huron, the Jesuit began weaving in healing knowledge in order to expand to a more efficient and superior society based on religion.

CE-Community Engaged
NC-North Carolina

G-Global
S-Sustainability

H-Honors
U-Charlotte

Abstract #118; Humanities

Title: Hanjungnok-Records Written in Silences

Student Author(s): Teresa Lowenstein **G**

Faculty Advisor: Dr. Dan Du

Department: History

The Analects of Confucius and other primary documents reveal the restrictions Confucianism and Neo-Confucianism placed on women writers. Research into the Late Chosen Korean Period (from the 18th to the 20th century) reflects a surprising number of female authors who despite marginalization and restrictions left behind an impressive body of literature. The conversation that percolates in the collective historiography reveals the role social status played in the lives of the three women who wrote despite the shackles of convention. Ultimately examination of their lives exemplifies the role they played in encouraging the marginalized to shatter the shackles of social constraints. The scholarship undertaken by Professor Hee-sook Han in connection with the impact of neo-Confucian beliefs on the life of women writers during the time and the research done by historian JaHyun Kim Haboush adds to knowledge of the time period. The resulting dialogue demonstrates not just the marginalization of women in Korea, but the obligations of filial piety and the dangers women faced. This paper examines examples of Choson Korean female writings to bring to life Korean culture of the past and allow these segregated voices once sequestered to be heard.

CE - Community Engaged
NC - North Carolina

G - Global
S - Sustainability

H - Honors
U - Charlotte

Abstract #119; Humanities

Title: Suffering after Genocide: Armenian Refugees from the Armenian Republic to Soviet Era

Student Author(s): Hunter Mikels **G, H**

Faculty Advisor: Dr. Ella Fratantuono

Department: History

The Armenian Genocide occurred during WWI (1914-1918). Hundreds of thousands of Armenians were slaughtered by the Ottoman Empire during this time. Following the Armenian Genocide, an independent Armenian state was erected after Russia lost control of the territory due to the communist revolution. The location of the First Republic of Armenia (FROA) was in the Caucasus region which is fixed between Anatolia and Russia at this time. Armenian nationalism, which emerged under the Ottoman Empire and the cultural blight of the Armenian Genocide, pushed Armenians to migrate to the FROA. The FROA was subject to a variety of problems such as conflict with hostile neighbors, geographical limitations, and political shortcomings. Because of this, independent Armenia struggled to adequately supply the large numbers of refugees in the state and soon fell to the Soviet Union in 1920. This thesis argues that the suffering of Armenian refugees did not end after the Armenian Genocide but continued throughout the FROA. Furthermore, the suffering of Armenian refugees evolved after the FROA. International and Soviet relief solved the welfare issue that plagued the FROA. By the 1930s, Armenia's saw production and population growth. Despite this long-needed relief and growth, communism repressed the national identity of Armenians in the region.

Abstract #120; Humanities

Title: A Comparative Analysis of the Effects of Critical Mass or Critical Actor Theory

Student Author(s): Oluwatobi Kalejaiye **G, H**

Faculty Advisor: Dr. Beth Whitaker

Department: Political Science and Public Administration

How do we ensure women are represented? Descriptive representation is the idea that elected representatives should resemble the population they are representing. An efficient descriptive representation supposedly leads to an efficient substantive representation. Substantive representation is the advocacy of issues those represented find to be important. Researchers often debate what is the best way to ensure the descriptive representation of women, through critical mass or critical actors? This study was proposed to answer that question by examining the effects of women in parliament. This study examines the relationship between women, critical mass, and critical actor theory in the sub-Saharan African countries of Nigeria and Kenya. Critical mass theory says once women hold a certain proportion of seats in parliament, political behavior, institutions, and public policy will be transformed. The theory asserts that unless women constitute a 30 percent threshold of elected representatives, there will be no major political outcomes. On the other hand, critical actor theory finds that women can make a difference even when they have a small minority, instead of an increased number of women in parliament, an emphasis should be placed on the role of the few women in parliament. I argue that critical mass and critical actors will affect the introduction and passage of legislation regarding the issue of domestic violence. I conduct a process trace analysis of bills concerning violence against women within the parliamentary debate of each respective country. With the data collected I analyze the effect of an increased number of women in parliament

Abstract #121; Humanities

Title: The Modern Metropolis of the Middle Class: The Impact of Victorian London's Middle Class on the Built Environment

Student Author(s): Gabrielle Briggs **G, H**

Faculty Advisor: Dr. Peter Thorsheim

Department: History

This thesis examines the relationship between the rising urban middle class and the physical changes to London's built environment during the mid-Victorian era. Post Industrial Revolution, a growing middle class people, armed with both an education and increased salaries, followed the trend of urban migration and flocked to cities which held greater opportunities for the growing class. London experienced the greatest increase in population and unfortunately, the city did not possess the infrastructure to deal with this massive influx of people. This resulted in the massive physical change and growth of London to try and accommodate the growing population and to deal with the issues resulting from the population explosion. The most significant aspects that affected the transforming landscape can be put into three categories: housing, sanitation, and transportation. This piece focuses on the London neighborhood of Pimlico which serves as a model case study for the changes in London's built environment as it epitomizes the major developments in housing, sanitation, and transportation during the mid-nineteenth-century. The development and changes which occurred in Pimlico as a result of an increasing middle-class population reflect the larger changes that occurred within London as a whole during the Victorian era.

Abstract #122; Humanities

Title: Gandhi and British Suffrage: The Constitutional Recognition of Personhood

Student Author(s): Natalie Mount **G**

Faculty Advisor: Dr. Ritika Prasad

Department: History

In the twentieth century, British subjects challenged their leaders to formally recognize not only their existence but also their collective voice. British women formalized the struggle for female suffrage in the middle of the nineteenth century. They continued to develop this push for public reform into the twentieth century. Mohandas K. Gandhi began his political career within the same temporal and imperial context as the suffrage movement. Most historians acknowledge the coexistence of the suffrage movement and Gandhi. Few historians compare these two subjects, and even fewer historians discuss the nonviolent sector of the British suffrage movement. Such a limited comparison ignores the contribution of nonviolent suffragists to the development and ultimate success of the suffrage movement in Britain. Moreover, this method fails to truly represent the complexity of the two subjects' dialogical struggle over the application or rejection of force. Thankfully, these political reformers recorded such struggles in speeches, pamphlets, newspapers, and books. This thesis argues two points: (1) suffragists provide the middle ground between the violence of the suffragettes and the nonviolence of Gandhi, and (2) such a middle ground enables a new comparison of the application and/or rejection of force by these groups.

Abstract #123; Humanities

Title: The Lingering Impact of Reverse Course Policies on Japanese Politics and Democracy

Student Author(s): Noah Corby **G, H**

Faculty Advisor: Dr. Maren Ehlers

Department: History

My thesis focuses on analyzing the impacts of the American Occupation of Japan on Japanese politics and democracy, especially those of the "Reverse Course" policy shift. My work analyses the initial, more progressive Occupation policies, the factors which then lead to the more conservative "Reverse Course" policies, and their implementation and lingering impact on Japan even after the occupation had ended. This is done by doing a comparison of the more modern historiography to the older waves during the initial occupation period, the 1960's and the 1980's. My thesis provides this analysis by looking at primary and secondary sources for these different eras, incorporating both from American and Japanese perspectives, as well as by comparing the historiography of the matter to show how opinions and interpretations of the overall "success" of the Occupation have changed. This analysis of the historiography shows how the earlier historiography especially was optimistic for Japanese democratic success, and how this changed over time with Japanese political and democratic developments.

Abstract #124; Humanities

Title: Jonestown and the Forgotten

Student Author(s): Alexandra Hemsley **G, H**

Faculty Advisor: Dr. Christopher Cameron

Department: History

On November 18th, 1978 over 900 members of a group called the Peoples Temple died in an event that has been debated as either murder or a suicidal pact amongst members. Throughout the analysis of the events at Jonestown, historians have neglected that the majority of people who died in Jonestown were black, and instead have chosen to focus on the controversy of Jim Jones. The demographics of the Peoples Temple show a clear need for a look at race relations, the era for which the event took place, and the need for a more holistic analysis of Jonestown and the Peoples Temple that include the voices of black survivors through means such as primary accounts. In my research, by discussing Jonestown through the lens of black religion and the black experience, it will be seen that the Jonestown Massacre was more than a cult killing, but rather a methodical racial injustice that was perpetrated against African-Americans. Ultimately, this research will begin to create a clearer picture that gives explanation and context for the success of the Peoples Temple, the black majority, and the Jonestown Massacre and its relation to black religion and the black experience.

Abstract #125; Humanities

Title: Foreign-Bound Protestantism: Women in the International Book Trade

Student Author(s): Brittany Smith **G**

Faculty Advisor: Dr. Amanda Pipkin

Department: History

In the history of the book and the Protestant Reformation, the printing press holds great significance. The quick production and spread of texts made theology more accessible to laypeople and more dangerous to European governments and the Catholic Church. To suppress these ideas and maintain power, political and economic structures rose across the European continent and England to keep undesirable printing in check. Even before the advent of proper copyright law, censorship posed a challenge to those in the book trade. Printing books was a domestic profession and printing houses often stayed within specific families, giving early modern women an opportunity to participate both in the spread of religious ideas and the business world. Widows of printers often continued their husbands' businesses, though evidence suggests their presence even before their husbands' deaths. Though these women are sometimes difficult to track in legal and guild records, they were never truly absent from the book trade and Reformation. By examining the careers of three sixteenth-century widows printing Protestant works for the English book market, this study demonstrates both the agency and authority of women printing, as well as the international connections they forged within the book trade.

Abstract #126; Humanities

Title: Divine Intervention: A Study on the Non-Chalcedonian Viewpoint
of the Islamic Conquest

Student Author(s): Avery Canfield **G, H**

Faculty Advisor: Dr. Robert McEachnie

Department: History

This research paper examines the viewpoints of the Non-Chalcedonian Christians during Islamic conquest. The period of Islamic conquest examined in this research starts from the 7th century and lasts until the beginning of the 10th century. The Non-Chalcedonian Christians are defined as the Christians who split from the church after the Council of Chalcedon in 451 AD. These Christians are divided into two sects one being Monophysites and the other being Nestorians. The former believed Christ had one nature and the latter believed that Christ had two distinct natures, but both disagreed with the Chalcedonian Definition. Thus, this research aims to show that the doctrine created at the Council of Chalcedon influenced the views of the Non-Chalcedonian Christians. As this thesis states the Non-Chalcedonians viewed Islamic conquest as God's divine judgment on the Chalcedonians for their persecution that had caused great suffering. Thus, they viewed the Muslims as liberators for they freed the Non-Chalcedonians from the oppression of Chalcedonian Byzantine rule. This thesis does this by examining sources from Non-Chalcedonian Christians in the regions of Syria, Egypt, and Armenia. Through these sources, this thesis concludes that the Non-Chalcedonians did indeed view Muslims as God's judgment and as liberators.

CE - Community Engaged
NC - North Carolina

G - Global
S - Sustainability

H - Honors
U - Charlotte

Mathematics and Computer Sciences

CE-Community Engaged
NC-North Carolina

G-Global
S-Sustainability

H-Honors
U-Charlotte

Abstract #114; Mathematics and Computer Sciences

Title: Statistical Analysis of Health Care Spending in the United States

Student Author(s): Avery Johnson **G, H**

Faculty Advisor: Dr. Qingning Zhou

Department: Mathematics and Statistics

The objective of this research is to understand why the health care spending is so much higher in the U.S. as opposed to other high-income countries. In the literature, many authors have discussed the factors that may contribute to the high health care cost in the United States. In particular, a recent article published on the Journal of American Medical Association (Papanicolas, Woskie and Jha, 2018) identified three major factors: high salary for doctors, high prices for pharmaceuticals, and high administration expenses. Although the existing work has thoroughly evaluated related variables, their conclusions were reached mainly by using descriptive statistics. In this project, we will be investigating the problem of health care spending by using advanced statistical tools and looking into what variables are most significantly associated with the high health care cost in the U.S., in comparison with 10 other high-income countries. Besides those variables mentioned above, we will consider many other variables, for example, related to health insurance, health care utilization, health outcomes, and population health. The results of this research will provide some insights on why the U.S. spends so much on health care, and will suggest possible solutions to this problem.

Science, Technology, and Engineering

CE-Community Engaged
NC-North Carolina

G-Global
S-Sustainability

H-Honors
U-Charlotte

Abstract #127; Science, Technology, and Engineering

Title: Fibroblast Inflammasomes Promote Inflammation and Fibrosis in the
Breast Tumor Microenvironment

Student Author(s): Makenzie Postma **H**

Faculty Advisor: Dr. Didier Dréau

Department: Biological Sciences

Clinically, both incidence and mortality of breast cancer remain significant, despite progress in our understanding of cancer, and advances in treatments. Fibrosis is an independent prognosis marker of breast cancer, and cancer-associated fibroblasts promote cancer growth. Whether inflammasome activities of fibroblasts critically influence inflammation and fibrosis remains unclear. Thus, we determined whether fibroblast inflammasome activation altered the secretions of pro-inflammatory cytokines and fibrosis associated proteins. We assessed (1) the expression of the inflammasomes' proteins and (2) the secretions of the pro-inflammatory cytokines IL-1 β and IL-18 along with collagen I secretions by L929 fibroblasts in vitro. The effects of conditioned media collected from the aggressive 4T1 mammary tumor cells were also assessed. Our data indicate that L929 fibroblasts express the proteins associated with functional NLRP3 inflammasomes. Furthermore, following incubation with LPS, a classical inflammasome activator, L929 fibroblasts secreted significantly more IL1 β , matrix metalloproteinase 14, and collagen I. The effects of the NLRP3 inflammasome inhibitor MCC950 on L929 fibroblast secretions of pro-inflammatory cytokines and pro-fibrotic extracellular matrix proteins are also presented. These results (1) confirm the activity of inflammasome in fibroblasts, and (2) highlight the role of fibroblast inflammasomes in the generation of the pro-inflammatory and pro-fibrotic microenvironment in breast cancer.

Abstract #128; Science, Technology, and Engineering

Title: The Inflammatory Breast Tumor Microenvironment Promotes Angiogenesis

Student Author(s): Seth Flynn and Kristin Smoot **H**

Faculty Advisor: Dr. Didier Dréau

Department: Biological Sciences

Angiogenesis (blood vessel growth) is critical to breast cancer progression and has been successfully targeted in other cancer types. The local pro-inflammatory microenvironment promoted by tumor cells and immune cells facilitates angiogenesis. Whether endothelial cells also participate in the pro-inflammatory microenvironment remains unclear. Our previous observations indicate that endothelial cells have functional inflammasomes. Here we investigated the in vitro angiogenesis of 2H11 murine endothelial cells following treatment with secretions from tumor cells and macrophages. In both tube-forming and fibrin-sprouting assays, 2H11 cells were incubated with secretions from macrophages and tumor cells and the presence of tube-like structures and of vessels was determined. Results indicate that the numbers of nodes and meshes was increased in the presence of conditioned media (CM) from the triple negative mammary tumor cell 4T1. In addition, while CM from J774 macrophage had no significant effect on angiogenesis, CM from J774 cells incubated with 4T1 CM also promoted angiogenesis. The observations made using the fibrin-sprouting assay are also presented. These data underline the critical role of the microenvironment in the promotion of tumor angiogenesis and suggest that approaches targeting angiogenesis within the breast tumor may benefit breast cancer patients.

Abstract #129; Science, Technology, and Engineering

Title: Effects of Microbial Components on the Development and
Survival of *Nematostella Vectensis*

Student Author(s): Kendra Shaw and Molly Redmond **H**

Faculty Advisor: Dr. Adam Reitzel

Department: Biological Sciences

Aquatic animals are constantly in contact with diverse bacteria and other microbes, some of which are pathogenic and result in disease. Due to the episodic presence of diverse pathogens, animals have evolved complex mechanisms to identify and respond to different bacterial species collectively composing innate immunity. While the innate immune system is fairly well characterized and conserved between traditional animal model systems, the origin of innate immunity and how it responds to bacteria remains relatively unknown for most marine invertebrates. In this study, I have utilized an emerging model system in the phylum Cnidaria, the starlet sea anemone *Nematostella vectensis*, to characterize the sensitivity of developmental stages and the response of the hypothesized innate immune system to a bacterial cue: lipopolysaccharide (LPS). I first determined the sensitivity of developmental stages (embryos, larvae, juveniles) through exposure to concentrations of LPS (0 - 100 µg/ ml). Embryos were affected most by lethal concentrations of LPS (ranging from 20 µg/ml). I used these concentrations to measure expression of genes likely to be involved in innate immunity with quantitative PCR. Results from this ongoing research will identify potential molecular markers for future studies of how cnidarians respond to pathogens in their environment.

Abstract #130; Science, Technology, and Engineering

Title: The Fitness Cost of Antibiotic Resistance in Cystic Fibrosis B. Multivorans

Student Author(s): Philip Badzuh **H, S**

Faculty Advisor: Dr. Todd Steck

Department: Biological Sciences

Cystic fibrosis (CF) is an autosomal recessive genetic disorder that is characterized by mutations in the cystic fibrosis transmembrane conductance regulator (CFTR) gene. Inactive CFTR proteins result in a hypersecretion of mucus in the lungs, promoting respiratory infections. The most common treatment of CF is by the use of antibiotics, however, as lung bacterial populations evolve to develop antibiotic resistance, treatment becomes more difficult. Research suggests that there is a fitness cost associated with the fixation of resistance-conferring mutations. Examining growth rates is one way to examine fitness cost. Here, we measure the growth rates of antibiotic resistant strains of a bacterial pathogen commonly found in CF patients - Burkholderia multivorans. We quantify increase in colony size by capturing sequential images of seeded Petri plates incubated on a common scanner and using an open-source software called ScanLag to generate a growth curve for each colony. We then compare growth curves generated for different strains and evaluate the fitness cost associated with antibiotic-specific resistance. Understanding the fitness cost of antibiotic resistance in B. multivorans and may lead to more effective antibiotic treatment of CF in the future.

Abstract #131; Science, Technology, and Engineering

Title: Migratory Patterns of Plasmodium Vivax in Africa

Student Author(s): Colton Cantley and Daniel Kepple **H, G**

Faculty Advisor: Dr. Eugenia Lo

Department: Biological Sciences

Malaria is a life-threatening disease that effects millions of people annually. African regions contribute a disproportionately high share of malaria cases worldwide. Plasmodium vivax (*P. vivax*) utilizes the interaction between the Duffy binding protein (PvDBP) and its erythrocytic receptor termed Duffy antigen receptor for chemokines (DARC) as a means of establishing infection. People of African ancestry who have a mutation in the Duffy antigen/receptor for chemokine (DARC) gene upstream promoter region were thought to be resistant to Plasmodium vivax malaria infection; however, individuals with such a mutation have been recently reported to be infected with *P. vivax* in different parts of Africa. This indicates Plasmodium vivax has evolved to use an alternative ligand or receptor protein for entry and infection, thereby increasing its prevalence in Africa. This study will provide insight to *P. vivax* genetic origin and population genetic structure. Understanding these characteristics of *P. vivax* is imperative for evaluating species distribution and future transmission trends. We expect to find evidence on the migration patterns of *P. vivax* throughout Africa, as well as conserved genes in parasite populations. The results of these objectives will provide insight for determination of the infection mechanisms and, potentially, a suitable vaccine for malaria.

Abstract #132; Science, Technology, and Engineering

Title: In Vitro Enzymatic Synthesis of the Enterobacterial Common Antigen

Student Author(s): Claire Gates and Tim Wallen **H**

Faculty Advisor: Dr. Jay Troutman

Department: Chemistry

Surface polysaccharides are the primary antigens presented by pathogenic bacteria. These structures contribute to stress response, virulence and modulation of the host immune system. The elucidation of biochemical pathways leading to the production of these polysaccharides as well as the development of methods for their acquisition is therefore a clinically relevant research target. The enterobacterial common antigen (ECA) is a bacterial oligosaccharide that is shared among many species of enteric, i.e. gut-dwelling, bacteria. The presence of ECA has been shown to contribute to bacterial virulence as well as resistance to bile salts in *Salmonella enterica*. Structurally, the ECA is composed of a trisaccharide repeat unit attached to a lipid carrier. The enzymes from the ECA biosynthetic pathway were cloned, expressed and characterized, and the molecule was synthesized in vitro using a fluorescent lipid carrier. Products were analyzed by high performance liquid chromatography and mass spectrometry.

Abstract #133; Science, Technology, and Engineering

Title: Genome-Wide Discovery of Regulatory Hotspots in the Coding Transcripts of Malaria

Pathogen Plasmodium Falciparum

Student Author(s): Diana Renteria Alvarez **H**

Faculty Advisor: Dr. Kausik Chakrabarti

Department: Biological Sciences

Plasmodium falciparum is the pathogen responsible for the devastating disease called malaria in humans, and every year it causes over a million deaths worldwide. While there are existing drugs used to combat this disease, they are often ineffective due the parasites continual development of resistance towards these medications. That is why there is a need to explore new targets in the Plasmodium falciparum genome. The overall goal in this study is to discover genes that through developmental regulation could impact the morphology and viability of the parasite. Often times, the sequence and structural aspects of mRNA, contribute to developmental regulation by altering protein translation. Previous studies have shown that messenger RNAs (mRNAs), which provide the blueprint for protein synthesis, tend to fold into local secondary structures. Therefore, in this study I propose to measure differential accumulation of secondary structure in mRNAs from the malaria developmental cycle in human red blood cells to determine the functional importance of these structures. To characterize the biological significance of these secondary structure containing mRNAs, three specific aims are proposed. The expected outcome of this project is to acquire a measure of the physical consequences of structure on the survival of the parasite.

Abstract #134; Science, Technology, and Engineering

Title: The v-SNARES, Snc1, Snc2, and Gos1 Mediate Early Endosome Fusion in Yeast

Student Author(s): Sarah-Catherine Paschall **H**

Faculty Advisor: Dr. Richard Chi

Department: Biological Sciences

Clathrin-mediated endocytosis (CME) is a major trafficking pathway found in eukaryotic cells. Defects in this pathway are linked to many diseases such as Alzheimer's, Parkinson's, and certain cancers. Our lab uses budding yeast, *Saccharomyces cerevisiae*, as a model organism to study endocytic proteins. During CME, clathrin coated vesicles invaginate at the plasma membrane, uncoat and fuse to the early endosome and their cargoes and receptors enter the endo-lysosomal sorting pathway. While many of the subsequent steps of sorting and degradation have been elucidated, the fusion machinery at the endosome is not well understood. Recently, our lab conducted a screen utilizing a novel fluorescently labelled CME cargo, FITC-alpha factor, to visualize vesicle fusion to the endosome. Through this study we found mutants of v-SNARES *snc1*, *snc2*, and *gos1* confer a loss of endosomal fusion phenotype. In the current study we use a complementation experiment, to clone and transform *Snc1*, *Snc2* and *Gos1* into each knockout strain and look for the rescue of fluorescent endosomes. Indeed, we find overexpression of each gene restores endosomal fusion thus verifying our original phenotypes are not caused by secondary mutation in the cell. We also determine that PM vesicles colocalize with endosomal compartments suggesting that yeast CME follow a typical endo-lysosomal pathway.

Abstract #135; Science, Technology, and Engineering

Title: Metabolomic Dissection of Salt Tolerance in Wild Sweet Potato

Student Author(s): Sherry Xiong **H, S, NC, U**

Faculty Advisor: Dr. Bao-Hua Song

Department: Biological Sciences

Rapid population growth and decreasing farmland acreage, combined with climate changes, have generated a critical need for developing crop cultivars able to grow in marginal lands, such as those with high salt concentrations. *Ipomoea imperati* (beach morning glory) is a diploid wild relative of the agricultural crop sweet potato and grows under high saline conditions. Studying crop wild relatives has the advantage of applying untapped genetic resources in crop improvement due to close relationships and similar genome sizes. Due to the influences from seed dispersal and competition in pantropical areas, *I. imperati* has developed adaptive mechanisms to cope with salinity stress. The present study investigates the wild genetic resources combined with metabolomics technology to understand compounds and pathways involved in its salt-tolerance. Untargeted and targeted metabolic profiling was performed on root tissues collected from control and salt-treated plants using GC-MS analysis. The present study is the first to report on the metabolic responses to salinity stress on halophyte *I. imperati*. The results analyzed various metabolic processes and biological pathways involved in *I. imperati*, and a proposed mechanism was generated for a better understanding of the constitutive and induced defenses enabling the plant to adapt in extreme saline conditions.

Abstract #136; Science, Technology, and Engineering

Title: Chemovirotherapy of Pancreatic Ductal Adenocarcinoma by Combining Oncolytic Vesicular Stomatitis Virus with FDA-approved Chemotherapeutic Drugs

Student Author(s): Christopher Castagno, Cristina Bressy, Gaith Droby

Faculty Advisor: Dr. Valery Grdzelishvili

Department: Biological Sciences

Pancreatic ductal adenocarcinoma (PDAC) is one of the deadliest malignancies due to late disease presentation, early metastasis, and a limited response to chemotherapy and radiotherapy. Our previous research showed that vesicular stomatitis virus (VSV) based recombinants are effective oncolytic viruses against most tested human PDAC cell lines. However, some PDAC cell lines are resistant to VSV. In this study, we investigated combinations of VSV with FDA approved chemotherapeutic drugs against human PDAC cell lines, with the aim to widen the range of PDACs responsive to treatment. Among nine tested chemotherapeutic drugs, paclitaxel and gemcitabine showed the highest efficacy in reducing cell survival compared to virus or drug alone. Surprisingly, while paclitaxel improved VSV replication, gemcitabine inhibited it. Our additional data suggest that, while paclitaxel sensitized PDAC cells to VSV via inhibition of antiviral signaling, the improved oncotoxicity of VSV/gemcitabine combination was due to VSV sensitizing PDAC cells to gemcitabine. Importantly, VSV/paclitaxel and VSV/gemcitabine combinations did not enhance viral replication or cytotoxicity in an array of normal human fibroblast cells and in non-malignant human pancreatic ductal cells. Our data show that the combinations of VSV with paclitaxel or gemcitabine are promising treatment options against a wide range of PDACs.

Abstract #137; Science, Technology, and Engineering

Title: An Integrative Study of Marmot Responses to Ecotourism

Student Author(s): Julia Nelson **H**

Faculty Advisor: Dr. Diane Zablotsky

Department: Gerontology

Human disturbance in the form of ecotourism alters behavior in many species and may impact fitness, but few studies take an integrative approach to quantify impact in various ways to test for variation in physiological, behavioral, and consequential life history and demographic traits. We extended a previous study on antipredator behavior for yellow-bellied marmots (*Marmota flaviventris*) by controlling for natural predation and by splitting the data by marmot age group. In addition, we tested the assumption between altered behavior and a decreased fitness by analyzing different physiological traits. Using 2009 disturbance data of vehicles, hikers, bicycles, and dogs from a previous impact study conducted by Li et al., we analyzed the relationship between the different types of disturbance with the variables of stress, mass gain, summer survival, and annual survival from that same year. We fit models to each age class for each type of disturbance for each variable. We found that, across all variables, juvenile marmots were most sensitive to human disturbance. Behavioral traits were more sensitive to variation in human disturbance than physiological traits. Mass gain rate, a fitness correlate, was relatively impacted by disturbance, but does not impact overall marmot fitness. Despite behavioral and some physiological impacts of human visitation, variation in visitation does not explain marmots' likelihood of surviving the summer or to the next year. This suggests that marmots are compensating for behavioral modifications, the mechanisms of which are not yet known.

Abstract #138; Science, Technology, and Engineering

Title: Lyophilization and Stable Storage of Nucleic Acid Nanoparticles

Student Author(s): Allison Tran and Justin Halman **H**

Faculty Advisor: Dr. Kirill Afonin

Department: Biological Sciences

RNA therapeutics are an emerging class of pharmaceuticals with an increasing amount of potential in clinical applications. Recent advances in nanotechnology have allowed for the methodical design of RNA and DNA nanoparticles that can assemble into desired structures with high uniformity and reproducibility. These novel structures have the ability to carry several therapeutic moieties, allowing for synergistic and combinatorial therapy. Despite their efficacy and potential, efficient storage and transportation has been a continual issue due to their reduced stability at high temperatures. Nucleic acids shipped in liquid form require constant refrigeration, which greatly increases the cost of transportation. This project proposes a method of dehydrating nucleic acid nanoparticles via lyophilization for efficient storage and transportation. Lyophilization is the process of drying samples by freezing them and then allowing their contents to sublime in a pressure-lowering vacuum. The results show that, even across storage at various temperatures, lyophilization successfully preserves the stability of the nanoparticles more efficiently than heat drying, or storing in solution. Overall, this proposed method can be potentially be utilized as an optimal method of dehydration for the stable storage and transportation of nucleic acid nanoparticles.

Abstract #139; Science, Technology, and Engineering

Title: Adsorption Studies of a Novel Divalent, Dinuclear Copper Coordination

Complex for Use in Supercapacitors

Student Author(s): Matthew Bonfield and Terawit Art Kongruengkit **S**

Faculty Advisor: Dr. Jordan Poler

Department: Chemistry

The world's growing infrastructure calls for increased demand in energy availability. Carbon nanotubes have shown great promise in the realm of energy storage. Their large surface area promotes an increased capacitance, which can be tuned and optimized by adjusting the distance between the nanoparticles using inter-particle molecular spacers. Addition of these spacers has the potential to cause aggregation among the nanotubes which drastically reduces the surface area which, in turn, makes the capacitance of the dispersion negligible. Finding the concentration of these spacers which yields maximum capacitance and stability is possible through dispersion stability studies. I have performed such a study using sodium bromide as the coagulant in a SWCNT dispersion in DMF and determined that the dispersion stability is $73.3 \pm 1.7 \mu\text{M}$. Concentrations of SWCNT were measured using UV-Vis spectroscopy. We found that only 0.25% water by mass will destabilize the dispersed nanotubes, so molecular sieves were used to dry all solutions that would contribute to water contamination. Previous papers have shown that divalent complexes make exceptional inter-particle spacers due to their strong adsorption onto CNTs. I will present UV-Vis data gathered from adsorption and stability studies using a novel divalent, dinuclear copper hydrazone coordination complex.

Abstract #140; Science, Technology, and Engineering

Title: Fabrication of Carbon Nano Tube Electrode Systems for
High Energy Storage Applications

Student Author(s): Nickolas Zelenka **S**

Faculty Advisor: Dr. Jordan Poler

Department: Chemistry

As the modern world progresses to utilize more renewable energy sources such as wind and solar power, these energy sources require effective ways to store the energy as they are periodic and transient. Supercapacitors have shown promising application as power storage devices. Supercapacitors fabricated from carbon nano tubes (CNTs) have shown that they are able to store energy. The accessibility of high specific surface area of CNTs are not fully utilized due to the aggregating nature of CNTs. The use of metal coordination complexes as molecular spacers that sit between the CNTs has been shown to increase the ion-accessible surface area, while also maintaining porosity and electrical conductivity throughout the structure. These are all important aspects for supercapacitors to achieve maximizing energy storage. Currently we are fabricating a novel electrode system that deposits the CNTs onto carbon paper. Using this fabrication technique, the energy storage of pristine CNTs was measured as 84 Wh/Kg. By incorporating a ruthenium complex as a spacer, the energy storage was increased to 114 Wh/Kg. The electrode fabrication, optical microscopy characterization, and performance testing through electrochemical studies of different spacers will be presented

Abstract #141; Science, Technology, and Engineering

Title: Sustainable Purification of NanoResin Functionalization

Student Author(s): Rabia Sheikh, Nicolas Johnson, Abhispa Sah, Kayla Durkin **S**

Faculty Advisor: Dr. Jordan Poler

Department: Chemistry

Water pollution is an increasing concern in today's society. All drinking water sources contain natural organic matter (NOM), which become DBPs during certain stages in the water treatment process causing an adverse effect on human health. To solve this issue, we performed an all-aqueous synthesis of an anion exchange resin made up of short-chain polyelectrolyte brushes covalently bound to carbon nanotubes (CNTs). This polyelectrolyte is fused onto a thin film membrane for testing against analyte adsorption. Before the polyelectrolyte is fused onto a thin film membrane, we must confirm that there isn't any unbound polymer, therefore we need to find a sustainable way to do so. In previous studies, the aqueous synthesis of functionalized CNT NanoResin required at least 8 centrifugation and dispersal into brine cycles to confirm that the unbound polymer concentration was below the detection limit. Using the Soxhlet extraction method to purify the NanoResin, we are able to minimize the number of rinses, making the overall functionalization more atom efficient. Starting with 75 mg of polymer, we were able to reduce the mass to 0.33 mg after 2 purification cycles using the Soxhlet extraction, meaning that the majority of the polymer is covalently bonded to the CNTs.

Abstract #142; Science, Technology, and Engineering

Title: Synthesis and Reactivity of Expanded-Ring Heterocyclic Selones

Student Author(s): Keri Dowling

Faculty Advisor: Dr. Daniel Rabinovich

Department: Chemistry

The synthesis, characterization, and coordination chemistry of three new N-heterocyclic selone (NHSe) ligands containing a saturated 1,3-diazepine ring and bulky aromatic substituents on the nitrogen atoms is described in this presentation. A series of closed-shell (d10) metal complexes have been synthesized in order to understand the effect that the size of the heterocyclic ring has on the Lewis basicity of the ligands, particularly relative to analogous ligands based on five- and six-membered rings. More specifically, several cadmium (II) and mercury (II) complexes (SDiazArSe)MX₂ (M = Cd, Hg; X = Cl, Br, I) and group 15 derivatives (SDiazArSe)MX₃ (M = Sb, Bi; X = Cl, Br, I) have been isolated and characterized by a combination of analytical and spectroscopic techniques. In addition, this presentation will outline our preliminary exploration of the reactivity of the selone ligands towards elemental halogens such as bromine and iodine, which lead to the formation of simple adducts of general formula (SDiazArSe)X₂ (X = Br, I).

Abstract #143; Science, Technology, and Engineering

Title: Optical Vibration Imaging for Condition Monitoring

Student Author(s): Taylor Ballard **NC**

Faculty Advisor: Dr. Tony Cinson

Department: Mechanical Engineering

Optical vibration measurement systems use a combination of cameras and post processing software to determine the vibration frequencies of objects that may otherwise be undetectable to the human eye. Evaluations of system accuracy and implementation of systems into power plant inspections were completed using OptiVibe, a product created by Allied Reliability Group. System accuracy was proved by comparison with a laser vibrometer and an oscilloscope while implementation was evaluated in a variety of ways. With use goals of condition monitoring, defect analysis, and preventing early fatigue failure, potential applications tested include a tripod system, and an unmanned aerial vehicle, and underwater use. For all applications, the OptiVibe system is a noncontact method of completing vibration analysis, further preventing component degradation, alteration, and human impact. Whether searching for unknown vibrations or determining if the vibration is out of specification for the system, optical vibration systems can be used.

Abstract #144; Science, Technology, and Engineering

Title: Structural Studies of the Sleeping Beauty Transposase

Student Author(s): Chenbo Yan, Gage O. Leighton, Rosario I. Corona, Jun-Tao Guo

Faculty Advisor: Dr. Irina Nesmelova

Department: Physics and Optical Science

DNA transposons are the jumping genes that can transfer DNA from one location to another, which is an important step for genetic engineering. As the first DNA transposon developed for vertebrate animals, Sleeping Beauty (SB) transposon is the most widely used transposon in genetic applications, and is currently in clinical trials for human gene therapy. It gained its name because it was brought back to activity from a long evolutionary sleep, it was reconstructed from the fossil of salmonid fish, which went extinct about 14 million years ago. In this project, we focus on the structural study of the PAI subdomain of the SB transposase. By introducing mutations in this subdomain, we can change the structure of the transposase, and affect its efficiency in DNA binding. Using Nuclear Magnetic Resonance (NMR) spectroscopy and Circular dichroism (CD), we are able to collect detailed information about structure, generate 3D models using molecular modeling, and identify the mutations that can increase the structural stability of the transposase. Increased structural stability is expected to improve the efficiency of the SB transposon system.

Abstract #145; Science, Technology, and Engineering

Title: One-dimensional Omnidirectional Etalons in Optical Fibers

Student Author(s): Joseph Obeid

Faculty Advisor: Dr. Tsing-Hua Her

Department: Physics and Optical Science

An etalon is typically made of two flat mirrors separated by a small distance. Incident light can be trapped inside the etalon, bouncing back and forth, generating beamlets, which interfere among themselves to produce resonance peaks in the transmission output. This phenomenon is called Fabry-Perot interference. With high mirror reflectivity, an etalon becomes an efficient optical filter to discern wavelengths of the light, an indispensable tool in optics and photonics. If the incident light is not collimated or the mirrors are not parallel, higher order modes are generated inside the etalon, compromising its ability to discriminate light frequency. Optical fibers have a cylindrical shape along their axis. If uniformly coated with high reflecting materials, the cross-section of a fiber can act as an etalon with two opposing curved reflectors. When incident light is focused on the fiber one dimensionally via a cylindrical mirror, the surface of the fiber will match the wave front of light everywhere, as if they were flat. Fiber etalon therefore work with one-dimensionally focused light from all directions. In this work, I will experimentally measure the transmission spectrum from such cylindrical etalon, using a white light source that will be focused through a cylindrical curved mirror.

Abstract #146; Science, Technology, and Engineering

Title: Understanding the Mechanism of the Fluorescence of Gold-thiol Complexes

Student Author(s): Gabriel Palermo

Faculty Advisor: Dr. Shunji Egusa

Department: Physics and Optical Science

The synthesis and characterization of nanomaterials are cornerstones of nanoscience. Nanomaterials of gold (Au) have been extensively studied for their applications in targeted drug delivery, biosensing, and their ability to tune the properties of materials. Au nanomaterials are intriguing from a physics perspective, bridging the gap between single Au atoms and the bulk. Numerous methods for synthesizing Au nanomaterials have been reported over the years. However, the detailed mechanisms behind their formation and their properties has remained elusive. There are many protocols that produce fluorescent small (<1.5 nm in size) gold nanomaterials stabilized with thiol. We elucidate Au-thiol bonds as a potential new mechanism of fluorescence in small Au nanomaterials. We conduct combined time-course and ratiometric experiment using red fluorescent Au-thiol complexes to study the emergence of fluorescence. Furthermore, a well-known protocol for producing monodispersed Au nanoparticles is modified to produce fluorescent nanomaterials. By varying the reaction parameters such as solvent, temperature, as stoichiometry, we aim to understand an aspect of the mechanism of fluorophore formation in Au nanomaterials.

Abstract #147; Science, Technology, and Engineering

Title: Verifying a Volume Hysteresis Effect in Many Ternary Solutions to
Computationally Measure the Glass Transition Concentration

Student Author(s): Austin Bloom

Faculty Advisor: Dr. Donald Jacobs

Department: Physics and Optical Science

Solutions of choline monohydrogen phosphate (CHMP), trehalose, and water are experimentally known to have good glass forming properties. Previous work involving molecular dynamics simulations, held in a 2:1 stoichiometric ratio at 300 K, has shown that there exists a volume hysteresis effect during npt (pressure) equilibration. The hysteresis was observed by changing the edge length of the simulation box for each concentration in increments of 5 angstroms, starting at 120 angstroms and ending at 140 angstroms. Above the glass transition concentration, all five simulated volumes always converge to different final volumes after equilibration; below this concentration, however, they converge to the same volume. This represents an in silico equivalent to volume hysteresis observed in experiment in which the glassy matrix releases strain upon quenching of the sample. We seek to verify this hysteresis effect across a range of systems by generating statistics from hundreds of systems at different temperatures.

Social Sciences

CE-Community Engaged
NC-North Carolina

G-Global
S-Sustainability

H-Honors
U-Charlotte

Abstract #149; Social Sciences

Title: Communication: Male and Female Professors in the Classroom
and Its Effects on Students

Student Author(s): Charity Clark

Faculty Advisor: Dr. Meghan Barnes

Department: English

This project examines the different ways male and female professors use language in college classrooms to instruct and promote participation among students. It applies the theory that American students are conditioned to prefer the instruction of female professors, perhaps due to the feminization of the teaching profession that began in the 1840s. Through observations, audio recordings, and transcriptions from a male and female professor's classroom and also interviews with a male and female student, it has been concluded that male professors use more commands when promoting participation in a classroom, while female professors tend to use the power of suggestion. Female professors are more considerate to the class than their male counterparts, and therefore, students tend to prefer the instruction of female professors, as stated in interviews. Students may find this research useful when signing up for classes. Professors may also find this information useful, as it provides aspects both sexes could work on when communicating with their classes.

Abstract #150; Social Sciences

Title: Does the Caseload of Youth and Family Services Workers
affect their Work Performance?

Student Author(s): Thomasina Pearce **CE, H, NC, U**

Faculty Advisor: Dr. Annelise Mennicke

Department: Social Work

Mecklenburg County's Youth and Family Services (YFS) unit has been ridiculed for their lack of diligence in protecting children from abuse or neglect (Perlmutter, 2014). Prior research presents evidence that factors, such as one's caseload, may contribute to the way in which a worker fulfills job-related tasks (Barbee, 2018). Due to the lack of evidence specific to YFS workers, the subsequent research proposal serves to answer the research question: does the caseload of YFS workers affect their work performance? Exploratory research will be conducted, utilizing a quantitative, cross-sectional design. YFS workers at the Charlotte East location of Mecklenburg County's Department of Social Services (DSS) will be selected using a systematic random sampling method. Selected employees will be invited to complete a questionnaire from which numerical data will be collected. The ratio variable of caseload will be compared to the ordinal variable of work performance (as measured through the Likert scale on the questionnaire) by using Pearson's r statistics with a p-value < .05 indicating statistical significance. Results will determine the extent to which caseload affects a YFS worker's work performance. Identifying a relationship between caseload and work performance may implicate a need to adjust caseload standards at Mecklenburg County's YFS unit in order to improve workers' ability to protect children on their caseload.

CE - Community Engaged
NC - North Carolina

G - Global
S - Sustainability

H - Honors
U - Charlotte

Abstract #151; Social Sciences

Title: Causes and Current Intervention Methods of Gender-Based
Violence in South Africa and the United States

Student Author(s): Andrea Badillo-Pérez **G, H**

Faculty Advisor: Dr. Diane Zablotsky

Department: Sociology

Even though Gender-Based Violence (GBV) is a global phenomenon, South Africa's nationally inferred statistics are disproportionately high. Like other patriarchal societies, demonstrated through statistical data from different research articles that were explored, hegemonic masculinities play a large role in the prevalence of GBV in South Africa. This investigation of GBV in South Africa sought to examine the cause of their atypical national statistics as well as what intervention methods have been in place to address this issue. The evaluation of causes and intervention methods of GBV were analyzed through review of research literature and qualitative observations. Factors that play a role in GBV rates in South Africa through the country's unique history of apartheid include (1) extreme income and racial inequalities, (2) militarization of political struggles, (3) high presence of hegemonic masculinities, and (4) subsequent normalization of violence. Government initiatives have continuously failed to combat the issue at hand. It can be concluded that a masculinities-focused approach to intervention and prevention methods is could aid in reducing GBV prevalence rates in South Africa. This paper additionally compares GBV prevalence in the United States regarding the countries' differences of historical and social contexts.

CE - Community Engaged
NC - North Carolina

G - Global
S - Sustainability

H - Honors
U - Charlotte

Abstract #152; Social Sciences

Title: The Association of Depression and Alcohol Use in Social Media among Women from Underrepresented Minority Groups

Student Author(s): Brittany Cobb **H**

Faculty Advisor: Dr. Erika Montanaro

Department: Psychological Science

The increased use of social media across all populations has created exciting new avenues for researchers to further understand individuals' attitudes, beliefs, and behaviors. To date, most research conducted via social media has focused on Twitter and Facebook. The current research explores the potentially different perspective Instagram, specifically images, provides researchers in assessing mental health status and participation in risk behavior. Young ethnic minority women (e.g., African American) primarily use Instagram, thus the current study set out to examine if depression- and alcohol-related images were posted on Instagram within this population. The primary aim of this study was to investigate if young minority women would use depressive imagery in their Instagram pictures, as well as share images that show alcohol use. After examining preliminary participant images (N=112) from the previous 6 months, preliminary results indicated that depressive images were posted at least once by a majority of participants. Additionally, no photos showed alcohol present. However, all participants indicated that they had consumed alcohol in the past 30 days. While the preliminary results of this study do not suggest widespread posting of depressive symptoms or alcohol use, these types of posts are still occurring on Instagram. Future work should examine if images posted on Instagram are associated with actual depressive symptoms and alcohol use. These may serve as indicators of problematic mental health outcomes and/or alcohol use.

ABSTRACTS

Poster Presentations

CE-Community Engaged
NC-North Carolina

G-Global
S-Sustainability

H-Honors
U-Charlotte

Education

CE-Community Engaged
NC-North Carolina

G-Global
S-Sustainability

H-Honors
U-Charlotte

Abstract #800; Education

Title: Investigating the System of Homeschooling in the United States

Student Author(s): Moe Aoki

Faculty Advisor: Dr. Erik Byker

Department: Reading and Elementary Education

The purpose of this research is to investigate and report on the homeschooling system in the United States. I am from Japan. Before coming to the United States, I heard that there is an educational choice that enables children to have education at their house and it is developed in the United States. There are three research questions that guide my research: 1. First, I inquire about the overall state of homeschooling in the United States; How many people are homeschooled? When does it most often occur? At the elementary level or secondary level? 2. Second, I ask: What are the advantages and disadvantages of the homeschooling system? 3. Third, I inquire how the homeschooling system provides a safety net for kids in the United States. I use a literature review research methodology to investigate these research questions and found five resources to support my investigation. Related to the outcomes of my research, I narrow in and report on two findings. First, there is a tendency for home school students to focus on reading and writing. Second, I explain the advantages and disadvantages of having education at home.

Abstract #801; Education

Title: Inclusion of Profound Disabilities in Elementary Schools

Student Author(s): Paige Blackwelder and Spencer Reece **H**

Faculty Advisor: Dr. Erik Byker

Department: Reading and Elementary Education

The purpose of this research poster is to report on inclusion for students with profound disabilities in elementary schools. The topic of inclusion is a pertinent one that must begin to be addressed. Students with disabilities are likely to struggle in a classroom setting more compared to those without. Through inclusion, these students will still be successful while not feeling excluded. The question being asked in this research are as follows, (1) What are profound disabilities? (2) How can elementary schools include those who have profound disabilities? (3) What are the teaching strategies used for inclusion of profound disabilities by general education teachers in elementary schools? (lesson planning, classroom management, parents, etc.) and (4) What impacts do students with profound disabilities have on the classroom? Are they positive? Are they negative? Both? For this project, we used the research method of literature review. Through this process, we discovered six sources which include books, journals, a personal interview, and articles. We used the Atkins Library and as the ERIC database to find these sources. The findings/themes of our research include profound disabilities defined, teaching strategies, and impact. Teachers must research teaching strategies to effectively adjust to different kinds of students.

Abstract #802; Education

Title: Investigating and Comparing Aspects of SDG Goal 4: Quality Education

Student Author(s): Phoebe Frazelle and Emily Griffin **G**

Faculty Advisor: Dr. Erik Byker

Department: Reading and Elementary Education

The purpose of our research poster is to investigate and compare aspects of the Sustainable Development Goal (SDG) # 4, ensure inclusive and equitable quality education, and promote lifelong learning opportunities for all. In particular, we examined the following aspects of SDG # 4: funding and resources, special education quality. The main research question for our comparative study is: What are the similarities and differences among G20 countries related to the aspects of our Sustainable Development Goal? For this research presentation, we focus on comparisons among the United States, Argentina, and China. To conduct this research, we used a literature review research design methodology. We searched for resources on the Atkins Library databases using keywords like funding, resources, quality, special education, inclusion, and history. Our data is comprised of two country reports, four journal articles, and three other reliable sources. The findings of our research include a discussion of the challenges and possibilities in meeting SDG # 4, ensure inclusive and equitable quality education, and promote lifelong learning opportunities for all.

CE - Community Engaged
NC - North Carolina

G - Global
S - Sustainability

H - Honors
U - Charlotte

Abstract #803; Education

Title: Adolescents Perceptions of Incarcerated Parents

Student Author(s): My'Asia Jaaber **H**

Faculty Advisor: Dr. Erin FitzPatrick

Department: Special Education

While having an incarcerated parent creates difficulty financially, the children of incarcerated parents face additional challenges with socialization and academic performance. Unfortunately, there is a lack of research on incarceration's impact on students. This study provides insight regarding the social, emotional, and academic experiences of adolescents with incarcerated parents. Five students between the ages of 14-16 – four participants were African American, one Caucasian – were interviewed to illustrate each adolescent's individual experience through using their own words. Through qualitative analysis, eight themes were established: (a) change, (b) emotional impact, (c) distractions, (d) social impact, (e) student life goals, (f) education, (g) socialization with the non-incarcerated parent, and (h) shame. In addition to these eight themes, three interesting topics arose but were not prevalent to be considered a theme. Those are: (a) inconsistencies, (b) visitation, and (c) apathy. These results may support educators in fostering empathy and understanding of what students experience when parents are incarcerated, with special regard to academic and social implications. These findings are relevant as they allow educators who may come from other socioeconomic environments to more thoroughly understand students from diverse backgrounds. Future research exploring how to support students with incarcerated parents is needed.

Abstract #804; Education

Title: Universal Design for Learning: The United States and South Africa

Student Author(s): Natalia Mejia **G, H**

Faculty Advisor: Dr. Erik Byker

Department: Reading and Elementary Education

The purpose of this research study is to examine the conceptual framework of Universal Design for Learning (UDL) and teachers perceptions of UDL. Using survey research design, I compare the perceptions of the teacher in South Africa and the United States. I describe and report on UDL methods and how they are effectively integrated to help support students in schools. Universal Design for Learning (UDL) can be beneficial for all students throughout their education. These techniques can include allowing them to do an activity that gets them moving, having them change sitting locations around the classroom, or by making sure they receive enough outdoor time. The UDL is broken down into three areas: the “why,” “what,” and “how” of learning. This information is useful because it can help teachers stimulate motivation in the student, present content in different ways, and allow for students to express themselves. As I performed this literature review, the sources I found for this research paper range from scholarly articles to books to research journals. Incorporating this research into the teaching field could greatly improve education for all students. The major objective of my study is to perform a reliable, trustworthy, and influential study that will elucidate the benefits and challenges of UDL. That will also allow for a deeper understanding of teachers' perspectives as to the comparative perceptions of Universal Design for Learning in South Africa and the United States.

CE - Community Engaged
NC - North Carolina

G - Global
S - Sustainability

H - Honors
U - Charlotte

Abstract #805; Education

Title: Investigating and Comparing Aspects of Sustainable Development Goal #4

Student Author(s): Madeline Nottingham and Alex Martin **G**

Faculty Advisor: Dr. Erik Byker

Department: Reading and Elementary Education

The purpose of our research poster is to investigate and compare aspects of the Sustainable Development Goal #4: Quality Education. In particular, we examined the following aspects of SDG #4: lack of education funding in South Africa, and urban education in India. The main research question for our comparative study is: What are the similarities and differences among G20 countries related to the aspects of our Sustainable Development Goal? For this research presentation, we focus on comparisons among the United States, South Africa, and India. To conduct this research, we used a literature review research design methodology. We searched for resources on the Atkins Library databases using keywords like education, poverty, funding, and education system. Our data is comprised of three country reports, two journal articles, and four other reliable sources. The findings of our research include a discussion of the challenges and possibilities in meeting SDG #4: quality education.

Abstract #806; Education

Title: The Preparation of Special Education Teachers to Teach Communication to Students with Moderate to Severe Disabilities

Student Author(s): Sarah Roberson **H**

Faculty Advisor: Dr. Shawnee Wakeman

Department: Special Education

Freedom of speech is a basic human right. Having a way to communicate is a crucial part of independence. Without a way to communicate, students are subject to limited opportunity and choice. Most of the available research in the domain of communication suggests special education teachers feel unprepared to teach communication. The objective of this study was to pinpoint why special education teachers may feel unprepared to teach communication to students with moderate to severe disabilities. The research questions included: (a) What are special education teachers' perceptions of the preparation necessary to facilitate the communication needs of students with moderate to severe disabilities? (b) To what extent do special education teachers feel prepared to assess a student to determine a method for communication? , and (c) What are the challenges that special education teachers perceive in teaching communication? The study was conducted with a convergent mixed methods methodology. Data was collected by a pilot survey and a focus group. Participants felt somewhat to mostly prepared to assess a student to determine a mode for communication, but still, feel there is room for improvement. The difficulties in teaching communication included motivating the students, teaching students that they have the power to express themselves, and the time it takes to teach communication skills.

Abstract #807; Education

Title: Investigating and Comparing Aspects of Sustainable Development Goal #4

Student Author(s): Romi Youn and Kayla Saynorath **G**

Faculty Advisor: Dr. Erik Byker

Department: Reading and Elementary Education

The purpose of our research poster is to investigate and compare aspects of the Sustainable Development Goal (SDG) # 4, stress of education in South Korea, and the lack of education in South Africa. In particular, we examined the following aspects of SDG # 4: Stresses of Academics and Lack of Education. The main research question for our comparative study is: What are the similarities and differences among G20 countries related to the aspects of our Sustainable Development Goal? For this research presentation, we focus on comparisons among the United States, South Korea, and South Africa. To conduct this research, we used a literature review research design methodology. We searched for resources on the Atkins Library databases using keywords like education, school system, and stress. Our data is comprised of three country reports, one journal article, and 14 other reliable sources. The findings of our research include a discussion of the challenges and possibilities in meeting SDG 4 Quality Education.

Health Sciences

CE-Community Engaged
NC-North Carolina

G-Global
S-Sustainability

H-Honors
U-Charlotte

Abstract #808; Health Sciences

Title: Evaluating the Implementation of a Food Pharmacy to Address Acute Food Insecurity

Student Author(s): Andrea Badillo-Pérez, Ozgun H., and Hernandez B. **CE, H, NC, U**

Faculty Advisor: Dr. Heather Smith

Department: Geography and Earth Sciences

Background: 16% of Mecklenburg County is food insecure. Food insecurity is associated with poor health outcomes, a priority issue that Atrium Health has identified. Partnering with Loaves & Fishes, Biddle Point Family Practice (BFPF) established a Food Pharmacy to address food insecurity.

Objective: Evaluation of Food Pharmacy at BFPF to assess implementation barriers and facilitators.

Methods: Consolidated Framework for Implementation Research (CFIR) is the theoretical framework. Mini-interviews with patients and surveys with providers are being implemented. The pilot will last 30-days and consists of implementing the Protocol for Responding to and Assessing Patients' Assets, Risks, and Experiences (PRAPARE) with the USDA Hunger Vital Signs to screen patients for food insecurity and other social needs. Three providers wrote prescriptions for patients screening positive to receive a 2-day supply of non-perishable food.

Results: Currently, out of 92 scheduled patients, 52 completed screening, 40 declined, and 4 given a food pharmacy prescription. Preliminary data show (1) barriers to implementation- size of the clinic; (2) facilitators- how the initiative complements values and workflows of the clinic.

Conclusion: Low rate of referrals and a high number of patients declining the screening suggests changes to the implementation of the screening process and implementation of the food pharmacy should be explored.

CE - Community Engaged
NC - North Carolina

G - Global
S - Sustainability

H - Honors
U - Charlotte

Abstract #809; Health Sciences

Title: Protocol Development for Continuous Aerosol Therapy

Student Author(s): Jessica Brannan

Faculty Advisor: Dr. Jhaymie Cappiello

Department: Respiratory Therapy

Background: Continuous aerosol therapy (CAT) with Albuterol is a standard of care for severe bronchospasms. The goal is to provide effective dosing through safe medication delivery practices, optimal aerosol deposition, and dose control. No current standard of practice exists for this service. I reviewed current practice and literature search on this therapy to evaluate our service.

Methods: A survey was performed on CAT among several local health systems. A physician and a Lead Respiratory Therapist were interviewed. A literature search was also performed on CAT inclusive of equipment for delivery.

Results: Survey results reported CAT as a common service but delivery techniques and systems varied. No facility had an actual protocol for CAT. Expert opinion and evidence support the use of a standardized protocol, a vibrating mesh nebulizer, and a continuous delivery system.

Conclusion: A protocol for CAT inclusive of indications, dosing, monitoring, and delivery systems was developed for my facility. This protocol was designed for best practice to optimize drug delivery, decrease potential medication errors, limit interruptions, and improve patient outcomes. Further study is required following the implementation of this protocol to evaluate the impact.

Abstract #810; Health Sciences

Title: Chest Physiotherapy Compliance and Effectiveness for Cystic Fibrosis Patients

Student Author(s): Carl Cagle

Faculty Advisor: Dr. Jhaymie Cappiello

Department: Kinesiology

Background: Chest physiotherapy (CPT) plays an essential role in the lives of cystic fibrosis (CF) patients for secretion removal to improve their health and quality of life. Adherence to this therapy affects the quality of life and hospitalization rates. Despite several modalities of CPT, compliance is low. Many barriers exist for these patients to utilize this therapy.

Methods: A literature search was performed using the Cochrane Database of Systematic Reviews and the National Center for Biotechnology Information looking for evidence on CPT and compliance in CF. An interview with a pediatric pulmonologist specializing in CF management was also performed.

Result: Reported compliance rates are at 49% for patients performing their home CPT regimen and is below acceptable thresholds. Rates of compliance have been shown to increase based on provider-patient interaction levels. No evidence exists establishing one form of CPT as superior to another. No studies exist establishing physical exercise as a stand-alone replacement for CPT but is supportive in improving these patient's quality of life.

Conclusion: Chest physiotherapy is a highly beneficial modality in CF patients but frequently not performed. Compliance monitoring by providers should be re-evaluated for these patients and practices considered to increase adherence.

Abstract #811; Health Sciences

Title: Content Review of the CDC's National Centers for Chronic Disease Prevention and Health

Student Author(s): Makala Carrington **CE, H, NC**

Faculty Advisor: Dr. Colleen Shaw

Department: Centers for Disease Control and Prevention

On June 25, 2018, the National Center for Chronic Disease Prevention and Health Promotion Extramural Research Program Office published NOFO RFA-DP-19-001 Health Promotion and Disease Prevention Research Centers to provide funding to academic research centers to participate in the network of research from September 2019 – September 2024. Recipients of funding under this award will develop, implement, evaluate, disseminate and translate evidenced-based public health interventions that can be applied widely, particularly in underserved communities. The purpose of this project was to inform the planning of future performance monitoring and evaluation of the new PRC network. This project involved completion of: (1) a content review of the requirements of the NOFO that details program expectations, application requirements, evaluation methods, and projected outcomes, (2) a NOFO reference document for CDC PRC program staff that serves as a “cheat sheet” for staff to locate award requirements efficiently, (3) a revised project officer Summary Statement template to document funding recipient information and relevant elements for the new funding period. The NOFO was reviewed for application requirements, evaluation methods, projected outcomes, and gaps in content. A total of 15 requirements are identified in the NOFO. As a result of the content review, a reference document was developed for the CDC PRC program staff to identify core sets of expectations for consideration in monitoring performance. Information within the reference document outlines necessary requirements that all recipients (known as Prevention Research Centers) are required to implement at their institution to receive annual funding. The reference document provides a plain language, condensed version of the NOFO and may inform the provision of technical assistance during the 2019-2024 funding cycle. The current PRC Program's project officer Summary Statement template was drafted to capture relevant elements for the new funding period and document recipient information.

CE - Community Engaged
NC - North Carolina

G - Global
S - Sustainability

H - Honors
U - Charlotte

Abstract #812; Health Sciences

Title: Pediatric Pulmonary Navigators Bridge the Gap in Asthma Education

Student Author(s): Kimberly Chapman

Faculty Advisor: Dr. Jhaymie Cappiello

Department: Department of Kinesiology

Asthma is a serious chronic disease that affects pediatrics. According to the Center for Disease Control and Prevention's (CDC) 2016 national study, 8.3% of children less than 18 years of age have been diagnosed with asthma. This illness impacts their quality of life in regards to school missed, socialization, physical development, and puts them at risk for early death. These patients are frequently treated in hospital emergency departments for worsening symptoms and can be admitted if their symptoms are severe enough. Proper asthma management includes medication availability, administration technique, medication action, self-monitoring, and symptom management. To enable these patients to be optimally managed, pulmonary navigators have been developed to ensure both the patient and their caregivers have the knowledge and resources necessary to manage asthma symptoms and maintain their health. The use of this role has shown to decrease physician visits and hospital admissions in this population. Current hospital-based education often is provided at discharge only. I have developed a pediatric pulmonary navigator role for my facility to address these issues. This navigator would provide standardized education for both patient and caregiver during their hospital stay rather than solely at discharge with a goal to increase self-managements skill and reduce readmission rates.

Abstract #813; Health Sciences

Title: Will Pneumonia Vaccine Programs for Adults Decrease the Incidence of Adult Pneumonia and Severe Cases of the Illness in the Older Population?

Student Author(s): Andrea Cunin **CE, S**

Faculty Advisor: Dr. Michael Troxell

Department: Respiratory Therapy

Background: This project was completed to investigate and educate the importance of vaccines, specifically the pneumonia vaccine in the elderly population. I will discuss the history of vaccines, as well as research regarding vaccines and Autism. I will also discuss the severity of the illness and related illnesses with pneumonia. As well as the different causes of pneumonia, and the mortality related incidences.

Method: During this project, I researched through peer-reviewed articles, journals, statistical evidence, a sit-down interview with a pulmonologist, and a survey to the public.

Results: Survey results were that as an individual 38 of 53 would get the vaccination, and of those same 53, 49 of them recommend the elderly should receive the vaccine.

Conclusion: The conclusion includes a high risk of sepsis and mortality in the elderly population. Pneumonia is one of the largest costs for health insurance companies, and there is no advocacy for it in the public eye. By doing this project, my goal is to help inform, educate, and raise awareness of pneumonia, and the pneumonia vaccine.

Abstract #814; Health Sciences

Title: Asthma Education

Student Author(s): Bethany Bibey

Faculty Advisor: Dr. Amanda Dexter

Department: Kinesiology

Background: About 16% of the population is diagnosed with asthma. With an increase seen in asthma diagnoses appropriate asthma education is needed to help improve patients' quality of life. Asthma education can help to reduce readmission rates, decrease costs, increase medication compliance, and promote self-care.

Methods: The Pediatric Intensive Care Unit (PICU) Clinical Specialist Respiratory Therapist was interviewed about current asthma educational practices available in the hospital. A feedback survey was also sent out on current asthma education strategies and protocols. Finally, a literature search was conducted to display the use, incorporation, and advantages of asthma education during hospital admissions.

Results: Results confirmed that the hospital uses a clinical pathway for asthma education. Different protocols may be used for asthma education; however, extensive teaching was provided to all patients admitted for asthma. The literature review revealed the advantages of providing asthma education and offered post-admission & discharge resources for patients' and staff.

Conclusion: It is clear that a concise protocol and clinical pathway should be implemented and available for all patients with an asthma diagnosis. Asthma education can help the patient cope and better manage their disease process to improve their quality of life.

Abstract #815; Health Sciences

Title: Respiratory Therapy Navigator for COPD Education

Student Author(s): Hettie Dowdy

Faculty Advisor: Dr. Jhaymie Cappiello

Department: Kinesiology

Background: An inpatient education plan for Chronic Obstructive Pulmonary Disease (COPD) patients consist of the disease process, smoking cessation, symptom recognition, and self-management. Proper education for COPD patients by a Respiratory Therapy (RT), navigator, increases patient knowledge and decreases hospital re-admissions. Our facility does not currently use this role. This project focuses on the development of this position.

Methods: A survey was performed amongst staff members on the role and impact of a RT navigator. An interview with our facility manager on the benefits of formal education for COPD patients was performed. A literature search on Respiratory Navigators and COPD management was performed for best practice.

Results: Survey results indicated workloads do not allow adequate time for patient education. This survey was supportive of a Respiratory Navigator. The literature strongly supports the impact of Respiratory Navigators. Facility manager recognizes the benefits and endorses a proposal for this role.

Conclusion: A Respiratory Therapy Navigator role is being developed and proposed at my facility. The plan will focus on disease education, smoking cessation, symptom recognition, and self-management. A comprehensive monitoring program will accompany this role to monitor effectiveness.

Abstract #816; Health Sciences

Title: Dual-Task Interference Training in Healthy Adults during Walking and Cycling

Student Author(s): Alison Fensterer **H**

Faculty Advisor: Dr. Luke Donovan and Dr. Abbey Fenwick

Department: Kinesiology

Many daily activities require the performance of a motor and cognitive task simultaneously. It is believed that completing both motor and cognitive tasks at the same time results in impaired performance of one or both tasks. Dual-task interference training, or forcing an individual to perform a cognitive task during motor task performance, is a popular rehabilitation technique. However, a limited number of motor and cognitive tasks have been utilized. Our study expanded upon past research to compare cognitive performance while healthy participants are either cycling or walking on a treadmill. Fifteen healthy adults completed three sessions separated by 48 hours: baseline cognitive task assessment, walking, and cycling. The order for walking and cycling was randomized. Both walking and cycling were performed for 30 minutes at a self-selected pace while a series of cognitive tasks are performed. The tasks used were the Stroop test, counting backward, and texting. Preliminary data analysis suggests that neither walking nor cycling influenced the accuracy of responses to the cognitive task. However, that reaction time improved during cycling on the Stroop test. Thus, stationary cycling may be an effective modality for dual-task training.

Abstract #817; Health Sciences

Title: Can a Tracheostomy Care Multidisciplinary Team Impact Tracheostomy Management as Measured by Complication and Decannulation Rates?

Student Author(s): Jacqueline Flake

Faculty Advisor: Dr. Jhaymie Cappiello

Department: Respiratory Therapy

A tracheostomy tube bypasses the upper airway and is inserted directly into the trachea. These tubes are necessary when there is physical disruption of the upper airway, long term mechanical ventilation needs, and or there is an inability for the patient to maintain patency of their airway. The optimal management for these tube include: tube patency maintenance, stoma/wound management, monitoring swallow function, upper airway evaluation, and the potential for decannulation. Complications for these tubes include bleeding, stoma infection, ulceration of surrounding skin, airway occlusion, tube dislodgement, and aspiration. To address the breadth of tracheostomy management needs, institutions have developed multidisciplinary teams. These teams have demonstrated a decrease in short and long term complication rates, tracheostomy-related emergencies, and reduced time to decannulation. Instituting a tracheostomy care team at my facility may improve our management. To evaluate my facilities practices and establish evidential support I interviewed a Speech Pathologist, surveyed facility Nurses, and Respiratory Therapists, tested staff base knowledge and performed a literature search. Results revealed opportunities for staff development in tracheostomy care and evidential support for multidisciplinary team involvement. A tracheostomy management team and a monitoring program for impact have been proposed at my facility.

Abstract #818; Health Sciences

Title: Exposing Ageism: The Aging of South Africa's HIV Epidemic

Student Author(s): Seth Flynn **G, H, CE**

Faculty Advisor: Dr. Diane Zablotsky

Department: Sociology

The ageist ideology that HIV infection is irrelevant to older adults has manifested itself through age-discriminatory limits in HIV surveys and poor targeting of HIV prevention and intervention strategies to older individuals. Recent data from the Demographic and Health Surveys showed that HIV prevalence is increasing over time in adults aged 45 years and above in 27 Sub-Saharan African countries; however, current country-specific data limitations exclude the screening of adults over the ages of 49, 54, or 59. The Health and Aging in Africa: Longitudinal Studies of IN-DEPTH Communities (HAALSI) demonstrated that condom use was 15% among HIV-negative adults, 27% among HIV-positive adults unaware of their HIV status, and 75% among HIV-positive adults aware of their HIV status at 95% confidence. The sexual behaviors, limited access to HIV testing, and social positioning of older adults in South Africa culminated in a critical epidemiological scenario. This research investigates the conditions under which older South Africans seek testing, the availability of treatment and prevention resources and the degree to which older adults access these resources, and scenarios which are conducive for new transmission to older adults while summarizing the effects of HIV and antiretroviral therapy on aging bodies.

CE - Community Engaged
NC - North Carolina

G - Global
S - Sustainability

H - Honors
U - Charlotte

Abstract #819; Health Sciences

Title: Optimal Mechanical Ventilator Settings during Venovenous ECMO

Student Author(s): Ousman Jallow

Faculty Advisor: Dr. Jhaymie L Cappiello

Department: Kinesiology

Since 2009 during the H1N1 pandemic flu, there has been a steady surge in the use of venovenous extracorporeal membrane oxygenation (VV ECMO) for adult respiratory failure requiring mechanical ventilation. Mechanical ventilation (MV) has been demonstrated to worsen lung injury if not properly managed. VV ECMO improves oxygenation and promotes CO₂ clearance. Ventilator settings should be minimized during ECMO to facilitate lung rest and minimize ventilator-induced lung injury. Little attention has been given to optimal MV management for lung protection in the setting of VV ECMO. A literature search was performed using keywords; respiratory failure, ECMO, lung protection, mechanical ventilation, and acute respiratory distress syndrome. Experts were interviewed on the subject of mechanical ventilator “rest settings” during VV ECMO. A mechanical ventilator protocol was proposed for “rest settings” during VV ECMO. This protocol was developed to minimize ventilator pressure, volume, and oxygen delivery to the injured lung. These settings were designed to decrease the potential for ventilator-induced lung injury and facilitate lung healing. Ventilator “rest settings” during VV ECMO standardize management and increase the use of lung protective ventilation strategies. Standardization of ventilator management in this setting may also improve diagnostic evaluation of lung healing. Further research is recommended.

Abstract #820; Health Sciences

Title: The Impact of Socioeconomic Status (SES) on Health Risk

Student Author(s): Laura Kam and Ashleigh Mitchell **NC, CE, U**

Faculty Advisor: Dr. Trudy Moore-Harrison

Department: Kinesiology

Purpose: To determine the relationship between socioeconomic status and the prevalence of being at “high risk” for various chronic health diseases.

Methods: Participants attended a health assessment at one of two senior centers. Tyvola was classified as a high-income area (\$66,513 median household income) and West Charlotte as a low-income area (\$35,563). Sixty-four participants attended the assessment at Tyvola, and Sixty-five participants attended one at West Charlotte. The health assessment tests included [a] blood lipid profile, [b] body composition, [c] blood pressure (BP), [d] pulmonary function test. Data for each participant’s cholesterol, HDL, LDL, triglycerides, HbA1c, the risk for COPD, body mass index, and BP was collected and categorized as “high risk” according to ACSM’s risk stratification.

Results: After assessing a total of 129 participants, we found that individuals living in the lower-income area have more health risks. Participants from West Charlotte had an average of 2.43 health risks per participant; 46% of the participants have three or more health risks. Participants from Tyvola had an average of 2.31 health risks per participant; 40% of the participants have three or more health risks.

Conclusion: Participants living in areas of lower SES are more likely to have a higher number of health risks.

Abstract #821; Health Sciences

Title: Proning Patients with ARDS

Student Author(s): Lyndsey Kenerley

Faculty Advisor: Dr. Michael Troxell

Department: Respiratory Therapy

Background: Proning patients with ARDS has been proven to make a significant difference in patient mortality rates. Evidence has found that proning patients redistributes dorsal to ventral so that the lung is no longer subject to high PPL and that the proning position improves perfusion to the non-dependent region of the lung. The goal of this project is to analyze data and studies to support the effectiveness of proning ARDS patients.

Methods: A survey was collected from respiratory care practitioners that have proning experience and education. An interview was conducted with a pulmonologist that is knowledgeable and an advocate of proning.

Results: Survey findings determined that those that completed the survey agreed that proning patients decrease patient mortality rates (86.67%), compared to those who thought that proning had no effect (13.33%). Respiratory therapist that completed the survey seemed knowledgeable on the subject and had an understanding of the importance and reason for proning. There have been many studies on the benefits of proning. The most significant is the PROSEVA study, which was able to produce patient outcomes; prior studies were inconclusive.

Conclusion: Early proning of ARDS patients has been shown to improve patient outcomes. Using the lung protecting strategy that is in line with ARDSnet and following a prone position protocol adapted by the hospital is an effective treatment for this particular population of patients.

Abstract #822; Health Sciences

Title: High-Frequency Oscillatory Ventilation and Conventional Mechanical Ventilation in Neonates

Student Author(s): Jessica Ledbetter **G, NC**

Faculty Advisor: Dr. Michael Troxell

Department: Respiratory Therapy

Background: Uncertainty remains as to the use of High-frequency oscillatory ventilation (HFOV) in premature infants (gestational age of fewer than 29 weeks) to help reduce chronic lung disease. In this research, multiple studies have been reviewed to compare the use of HFOV and conventional mechanical ventilation (CMV) and their outcomes in chronic lung disease.

Methods: Multicenter, randomized, and peer-reviewed studies were used from all over the United States and even the United Kingdom to compare their outcomes of chronic lung disease, as well as a survey sent out to respiratory therapists across North Carolina.

Results: In many studies, there was a small decrease in chronic lung disease in preterm infants that had been placed on HFOV. In one case the long-term outcomes were assessed, and premature infants that had been placed on HFOV had improved small airway function at ages 11-14.

Conclusion: In conclusion, there is a success with the use of HFOV, but more specific studies should be conducted. As well as more education on the use and management of both modes of ventilation.

Abstract #823; Health Sciences

Title: Bubble CPAP Protocol

Student Author(s): Crystal Lett

Faculty Advisor: Dr. Amanda Dexter

Department: Respiratory Care

Background: Chronic lung disease (CLD) remains an important issue in the NICU. CLD is a very costly disease, and improvements in patient care are ongoing for better outcomes and lower costs. Development of a well-thought-out bubble CPAP protocol can help respiratory therapists (RTs) better manage and wean CLD patients.

Methods: NC respiratory therapy managers were surveyed regarding the use and benefits of bubble CPAP protocols. A literature review was also completed. Next, an interview with a department director was done. Finally, a staff survey was conducted regarding protocol comfortability & educational needs.

Results: 48% of managers surveyed used bubble CPAP at their facility, but only 35% had a protocol. 58% of managers said having a protocol would be beneficial. The staff conveyed that they were not sufficient in protocols, would like to see more education. & that a bubble CPAP protocol would improve patient care.

Conclusions: A respiratory-driven protocol was developed for bubble CPAP. RT & nursing education was done in a skills lab. A “weaning card” was developed as a visual tool, which allowed everyone to see protocol progress. A multidisciplinary team approach is needed for the success of this protocol, with respiratory therapy being the key component.

Abstract #824' Health Sciences

Title: Effects of Linker Molecules Attached to the TAB001 Antibody against Pancreatic Cancer Cell Lines

Student Author(s): Peiyu Lu and Mukulika Bose

Faculty Advisor: Dr. Pinku Mukherjee

Department: Biological Sciences

The TAB004 antibody penetrates cancer cells expressing the t-MUC1 transmembrane glycoprotein. Our goal is to attack various epithelial cancer cell lines using a conjugated form of TAB004 to deliver the drug to cancer cells locally and directly. The only obstacle in this method of treatment is the unknown toxicity of linker molecules. Usually linker molecules are used in small quantities, so they do not induce an effect on experiments; however, the TAB004 requires a linker molecule for every antibody used in the treatment, so if the linker molecules can cause harm to both healthy and cancerous cells, then the TAB004 treatment will not work efficiently.

Abstract #825; Health Sciences

Title: The Effects of KRAS Activation on the Regulation of Tumor-Associated MUC1

Student Author(s): Chelsea Maccow and Priyanka Grover **H**

Faculty Advisor: Dr. Nitika, Dr. Andrew Truman, and Dr. Pinku Mukherjee

Department: Biological Sciences

Over the past decade, pancreatic cancer has impacted the lives of many individuals worldwide; leading it to become the third most common cause of cancer-related deaths (Siegel, 2018). Pancreatic ductal adenocarcinoma (PDAC) is characterized as a cancer of the epithelial cells that line the ducts of the pancreas. Past studies have found that mutated KRAS is a major driver of the oncogenic pathways associated with cancer progression and metastasis. Thus, it is known that the activation of mutant KRAS in normal cells leads to uncontrolled proliferation and aggressive malignancy. We hypothesize that mutated KRAS confers its aggressiveness via upregulation of Mucin 1 (MUC1) glycoprotein in PDAC cells. This study encompasses the use of CRISPR-Cas9 technology, Western Blotting, and clonogenic growth assay to test the hypothesis proposed. Understanding the mechanism by which KRAS mutations play a role in the aggressiveness of this cancer is important in the development of treatments and the reduction of mortality rates.

CE - Community Engaged
NC - North Carolina

G - Global
S - Sustainability

H - Honors
U - Charlotte

Abstract #826; Health Sciences

Title: The Efficacy of Pulmonary Rehabilitation for Patients with Pulmonary Fibrosis

Student Author(s): Devona Martin

Faculty Advisor: Dr. Amanda Dexter

Department: Kinesiology

Background: This study was conducted to determine the efficacy of pulmonary rehabilitation in pulmonary fibrosis (IPF) patients. IPF is a specific type of chronic progressive fibrosing interstitial pneumonia associated with a histopathologic pattern of usual interstitial pneumonia (UIP).

Methods: This study was completed by interviewing multiple professional clinicians that had firsthand experience with different types of chronic lung disease patients in pulmonary rehabilitation settings. A literature review was also completed to reflect the benefits of pulmonary rehabilitation for pulmonary fibrosis patients. Respiratory therapists with pulmonary rehabilitation experience were also surveyed.

Results: The interviews showed that the primary disease managed in pulmonary rehabilitation is COPD and the least common disease is pulmonary fibrosis. Several research studies revealed that pulmonary rehabilitation could decrease dyspnea, increase exercise capacity, improve health-related quality of life and reduce healthcare costs for patients with chronic lung diseases. Survey data is pending.

Conclusion: Pulmonary rehabilitation has short-term effects in enhancing exercise capacity and health-related quality of life in patients with IPF. However, the long-term effects of pulmonary rehabilitation in IPF patients remains inconclusive.

Abstract #827; Health Sciences

Title: Raising awareness of sleep disorder breathing in patients treated with Non Invasive ventilation for respiratory distress.

Student Author(s): Shawn Morgan

Faculty Advisor: Dr. Jhaymie Cappiello

Department: Respiratory Therapy

Background: A Respiratory Therapist driven Sleep Disorder Breathing (SDB) screening tool that includes patient education about risk factors and options for testing and diagnosis may positively impact a patient's health status and quality of life by guiding them towards a diagnosis of SDB.

Methods: Use of the STOP-Bang Questionnaire was implemented on patients that were treated with Noninvasive Ventilation for an acute respiratory exacerbation but have yet to be clinically diagnosed with a SDB problem.

Results: Currently the Respiratory Therapy team at my facility do not screen any patients for SDB in any capacity during their hospital stay. It was also concluded that MD's and providers only screened for SDB on an infrequent and limited basis. Implementation of the STOP-bang survey shows that many of the patients screened exhibit comorbidities suggestive of SDB and obtain a survey score that qualifies them for varying levels of risk for Obstructed Sleep Apnea. Findings from the survey are communicated to the providers in the respiratory notes so that MD recommendations for further treatment and workup can be prescribed.

Conclusion: Implementation of a Respiratory Therapist driven Sleep Disorder Breathing (SDB) screening tool increases the likelihood that those patients that exhibit SDB comorbidities will have a better chance of receiving a follow-up appointment referral with a proper sleep study provider.

Abstract #828; Health Sciences

Title: Estimating the number of Adults with PrEP Indications in Mecklenburg County

Student Author(s): Chiamaka Okonkwo **CE, H, NC, U**

Faculty Advisor: Dr. Patrick Robinson

Department: Academy for Population Innovation (APHI)

Purpose: In 2016, 265 new HIV cases were diagnosed in Mecklenburg County, ranking the Charlotte metropolitan statistical area (MSA) as having the 24th highest rate of new HIV diagnoses of all MSAs. Pre-exposure prophylaxis (PrEP) is highly efficacious for preventing the risk of new HIV infection in persons who are at increased risk. However, treatments can be relatively expensive and may present a financial burden to some individuals. As a result, an estimation of the number of adults with PrEP indications may facilitate assessment of interventions targeted at increasing PrEP usage.

Methods: Using population-representative statistical models previously applied at national and state levels, this project develops numerical estimates of individuals within behaviorally and demographically at-risk groups with PrEP indications in Mecklenburg County. Data on insurance coverage is also extrapolated to find numbers of these individuals who may require financial assistance to manage costs of PrEP administration.

Results: It was estimated that 9,336 people in Mecklenburg County had indications for PrEP; 1,130 of these individuals may also need financial assistance to manage PrEP administration costs.

Conclusion: By identifying individuals with PrEP needs, these estimates aid in the evaluation of progress in promoting PrEP usage and addressing disparities in HIV transmission in Mecklenburg County.

Abstract #829; Health Sciences

Title: Implementation of a Quality Assurance (QA) Program in a Multicenter Hospital System

Student Author(s): Colleen Parker

Faculty Advisor: Dr. Amanda Dexter

Department: Kinesiology

Background: Pulmonary function studies are used around the world to help guide healthcare professionals in the diagnosis, treatment, and care of patients. Although, these tests aid in the determination of life-changing decisions, including surgical candidacy, military acceptance, and cancer therapy and treatment with appropriate medications, there is no accrediting body overseeing that national standards for quality assurance are being met. This quality assurance project will showcase the significance of adhering to national quality standards to improve the validity of pulmonary function studies and discuss how the implementation of a QA program improves such adherence.

Methods: PubMed and CINAHL databases were searched for studies proving the effectiveness of quality assurance programs in pulmonary diagnostics. A survey was sent to 12 pulmonary function labs within a multi-hospital system to assess adherence to nine American Thoracic Society (ATS)/European Respiratory Society (ERS) quality standards.

Results: Responses to the survey from all 12 labs were received. The survey showed that only 38% of the QA criteria were met.

Conclusions: Adherence to ATS/ERS quality standards lacks in this multicenter hospital system. A QA management program is needed to improve pulmonary function testing quality. Compliance will be assessed one year after implementation by review of QA data.

Abstract #830; Health Sciences

Title: Compliance rates of positive airway pressure for OSA in a Veterans Administration Health Services: A Review and Recommendations.

Student Author(s): Avruti Patel

Faculty Advisor: Dr. Jhyamie Cappiello

Department: Kinesiology

Background: NIV (Non-Invasive Ventilation) for sleep-disordered breathing (SDB) is the standard of care. Compliance to therapy can be very challenging. Lack of compliance is a key factor in compromising the benefits and results in decreased cognitive function (including memory), hypertension and various pulmonary and cardiovascular diseases. Lack of compliance in the veteran population may increase PTSD symptoms.

Methods: This review was conducted over a consecutive three-month span at the Department of Veterans Affairs, Durham. One hundred and ten patients were included after 90 days of starting NIV for compliance without exception for positive airway pressure modes or specific SDB diagnoses. Patients were educated on a one-on-one basis to therapy and ramifications of non-compliance. In addition, hand-out and online education access information was provided for any type of issue related to therapy.

Results: Collective percentages in NIV compliance for SDB across modes were: CPAP45.95%, ASV60.88% BiPAP ST 70.25% and BiPAP 71.67%.

Conclusion: CPAP compliance was the lowest. This may be due to its use as the initial mode. Compliance rates improved as advanced modes were utilized. Compliance monitoring to NIV is key in improving successful therapy. Monitoring compliance rates across modes and diagnoses may prove useful to determine obstacles for compliance.

Abstract #831; Health Sciences

Title: Difference in clinical presentations of Kabuki Syndrome Based on Sex (male/female)

Student Author(s): Tyler Rapp **H**

Faculty Advisor: Dr. Diane Zablotsky

Department: Sociology

Kabuki Syndrome (KS) is caused by a mutation in the twelfth or X chromosome. Clinically, KS presents multisystemic features that may impair one's life longitudinally. For example, strabismus, short stature, cleft palate, and intellectual disability are a few common characteristics of a KS patient. Gaps in the literature exist due to its semi-recent discovery and rarity. In particular, given KS's unique genetic etiology, differences between males and females may exist. As such, this question on sex distinctions was explored, as understanding, this would provide a more comprehensive understanding of KS that could be translated into patient care. Using patient charts (N = 29; 17 females, 12 males), data was collected on the prevalence of all KS-specific symptoms. Chi-square results ($p = 0.79$) indicate that no significant difference exists between males and females regarding all known symptoms (38) of KS. As such, it can be understood that male and female KS patients do not experience a statistically significant different number of KS-related symptoms. However, given the complex nature of rare genetic abnormalities, advanced statistics and larger sample size may be necessary to decipher if specific symptoms and the severity of these symptoms vary among sex.

Abstract #832; Health Sciences

Title: Does Multidisciplinary Rounding Improve Patient Care?

Student Author(s): Amanda Regan

Faculty Advisor: Dr. Amanda Dexter

Department: Respiratory Therapy

Background: An entire clinical team works together to get a critical patient out of the ICU. This study looked to determine if patients are better managed by the entire team rounding together versus the team sporadically performing patient assessments independently throughout the day per staff convenience.

Methods: Literature review found several studies supporting the theory that multidisciplinary rounding improves patient care. I surveyed active respiratory therapists (RTs) to get their insight into multidisciplinary rounding. Additionally, an interview was conducted with Dr. Mery. He's an intensivist on the SICU and a strong advocate for multidisciplinary rounding.

Results: Survey results revealed 90.71% of RTs work where multidisciplinary rounding is performed. 89.93% gained more confidence to speak with other members of the health care team due to rounds. 82.73% of RTs felt that they are valued in rounds. 76.98% of rounds are performed at a set time every day. While 89.78% stated if rounding was not mandatory, they would still implement it, and 90.58% felt patients are given better care due to rounding.

Conclusions: Multidisciplinary rounding helps improve patient care. It helps staff identify who are the most critical patients, and what is the most acute clinical issue to be improved.

Abstract #833; Health Sciences

Title: RNA-DNA Fibers and Polygons with Controlled Immunorecognition Activate RNAi and Transcriptional Regulation of NF- κ B

Student Author(s): Melina Richardson, Weina Ke, Enping Hong, Renata F. Saito, Maria Cristina Rangel, Jian Wang, Mathias Viard, Emil F. Khisamutdinov, Martin Panigaj, Nikolay V. Dokholyan, Roger Chammas, and Marina A. Dobrovolskaia **H**

Faculty Advisor: Dr. Kirill Afonin

Department: Chemistry

Nucleic acid-based nanomaterials that interact with each other and further communicate with the cellular machinery in a controlled manner can overcome limitations of traditional approaches and substantially improve the potential therapeutic utility of nucleic acids. This notion enables the development of novel biocompatible “smart” therapeutics and biosensors with precisely controlled physicochemical and biological properties. We extend this novel concept by designing a set of dynamic RNA-DNA fibers and polygons which have controlled immunostimulatory properties and are able to cooperate in human cells. Their mutual interaction results in the release of a large number of different RNAi inducers while giving a fluorescent response and activating NF- κ B decoy oligonucleotides. This work expands the possibilities of dynamic nucleic acid nanotechnology by (i) introducing very simple designing principles and assembly protocols, (ii) allowing for a large number of RNAi inducers to be simultaneously released with additional functionalities embedded into the DNA sequences, (iii) providing controlled rates of re-association, stabilities in blood serum, and immunorecognition.

Abstract #834; Health Sciences

Title: Education on Asthma Management for Adults

Student Author(s): Emmeline Rios

Faculty Advisor: Dr. Michael Troxell

Department: Respiratory Therapy

Background: Asthma education management in adults has been shown to decrease healthcare utilization and improve disease control overall. Asthma education not only involves both the physician and the patient but all clinical specialists to improve better outcomes. Given proper asthma education to patients can reduce readmissions like exacerbations, introduce better knowledge of the disease, and improve quality of life.

Methods: A survey was taken between day and night shift respiratory therapists which include full-time, part-time and PRN's in my healthcare facility regarding what they have encountered or witnessed regarding asthma education. Many questions were aimed to ask the therapists for their own opinions and interactions on a day to day activities. Differences between day and night time results were compared to see whether either shift has a greater grasp on the need for asthma education or at least provided helpful information on the differences 12hrs can make.

Results: Survey results revealed that more than half of the therapists in both shifts have interacted with asthma patients that have either refused to do treatments, don't know how to properly take their inhalers or have not used a peak flow meter before. The survey also revealed that proper education between respiratory therapist and patients should be given at each point of care to ensure the patient has multiple attempts at grasping some, or if any new knowledge.

Conclusion: A respiratory therapist driven plan to manage asthma education throughout the healthcare facility can reduce readmissions, introduce better grasp of asthma knowledge and improve quality of life. Further study is required to receive in-depth outcomes and statistics regarding the implementation of asthma education within a specific setting.

Abstract #835; Health Sciences

Title: Understanding the Role of Hsp70 Phosphorylation in DNA Damage Response

Student Author(s): Lizbeth Saa and Laura Knighton

Faculty Advisor: Dr. Andrew Truman

Department: Biology

The Hsp70 molecular chaperone has been extensively studied for the last 50 years; it is highly conserved and are essential for many cellular processes. Despite this, little is known about how phosphorylation impacts Hsp70 in vivo function. Previous studies have shown that Hsp70 binds and activates several important proteins in the DNA damage response (DDR) pathway that include RNR, CHK1 and ATM/ATR in both human cells and in budding yeast. We initiated this study to determine whether the reverse is true: do DDR proteins activate Hsp70 through direct phosphorylation? We analyzed Hsp70 phosphorylation in human and yeast cells that had been treated with a variety of DNA-damaging agents by Phos-Tag SDS-PAGE. While hydrogen peroxide had little effect on yeast Hsp70; the other agents promoted a “ladder effect” indicative of multi-site phosphorylation. In parallel, we treated PC3 prostate cancer cells with a similar panel of DNA-damaging agents. While Phos-Tag SDS-PAGE analysis indicated Hsp70 phosphorylation; there was no laddering of the protein seen previously with yeast. Intriguingly, this suggests the regulation of Hsp70 phosphorylation is different between human and yeast cells. We are currently in the process of mutating possible Hsp70 phosphorylation sites in yeast in an effort to understand their role in cell growth and survival.

Abstract #836; Health Sciences

Title: Patient Education: Lung disease management

Student Author(s): Jessica Stamm

Faculty Advisor: Dr. Amanda Dexter

Department: Respiratory Therapy

Background: COPD is among the top leading causes of death in the United States. Research has shown that reinforced patient education can dramatically reduce exacerbation rates and help with disease management. Establishing good teaching strategies and a consistent curriculum will help staff with patient education.

Methods: A survey will be provided to pulmonary staff to evaluate educational topics & communication approaches. Once all survey data has been collected, an educational pamphlet will be created & provided to all staff participants and from there a second survey will be sent. The surveys will provide preliminary feedback to determine if staff education will be beneficial to patient care.

Results: Preliminary results show that all survey participants felt that patient education was lacking. Also, 100% of participants stated they would like to see more education provided to the patient and would be willing to learn and give out materials. All participants foresee many barriers to effective education & strategies for overcoming such obstacles must be found.

Conclusion: Staff is more likely to participate in patient education when provided information on what and how to do so. Providing written instructions and the proper amount of time is the only way to guarantee effective patient education.

Abstract #837; Health Sciences

Title: Developmental Care in the NICU: Does it affect the Outcome of Infants at Risk for Retinopathy of Prematurity?

Student Author(s): Kristen Stone

Faculty Advisor: Dr. Michael Troxell

Department: Kinesiology

Background: The drive behind this research is to clinically look at how developmental care in the Neonatal Intensive Care Unit affects the outcomes of infants at risk for Retinopathy of Prematurity.

Method: Research was conducted from a compilation of literary reviews. The University of North Carolina at Charlotte's library is where a large quantity of the information was gathered to answer the clinical question. Databases searched were the primarily CINAHL and PubMed. The curative outcome of several research studies was then compiled together to reach a conclusion. Developmental care is the gathering of evidence-based practices that provides guidelines for offering supportive care of infants admitted to the Neonatal Intensive Care Unit. Interventions observed in this review are nutrition, delivery room care protocols, stimulation, proper lighting, pain management, monitoring FIO₂, and oxygen levels, and involving parents in their infant's care.

Result: A meta-analysis was done of 23 articles from the years 2000-2018. These seven interventions were reviewed.

Conclusion: From the review findings, developmental care strategies helps to lessen the amount of stress, an infant is exposed to and shows a large reduction in neonatal morbidities such as IVH, BPD, and ROP.

Abstract #838; Health Sciences

Title: Success of Smoking Cessation Programs

Student Author(s): Jamie Sykes **NC**

Faculty Advisor: Dr. Amanda Dexter

Department: Kinesiology

Background: The state of North Carolina has a higher rate of smoking compared to the national average. This study was conducted to determine if smoking cessation programs in North Carolina use effective methods in the treatment of tobacco addiction.

Methods: A literature search was conducted regarding the use of Clinical Practice Guidelines (CPGs) for treating tobacco use and dependence. A comparative interview was performed to determine the differences between methodologies in two rural hospital smoking cessation programs. Surveys were issued to respiratory therapists to determine if they are using CPGs in their smoking cessation programs.

Results: The methods for smoking cessation education were similar between the two programs; however the certified addiction specialist at Rutherford Regional Medical Center followed Clinical Practice Guidelines more closely. Survey data is still pending.

Conclusion: Smoking cessation programs are more effective when the clinical educator follows Clinical Practice Guidelines. An effective way to decrease smoking rates in North Carolina is through proper patient education and cessation training based on Clinical Practice Guidelines.

Abstract #839; Health Sciences

Title: Medication Guide for Improving Medication Adherence and Effectiveness

Student Author(s): Kum Truong

Faculty Advisor: Dr. Amanda Dexter

Department: Kinesiology

Background: Utilization of medications to combat respiratory illnesses can greatly impact patients' quality of life. Understanding and identifying barriers to pharmacologic adherence and effectiveness is important to prescribe patients with appropriate medications.

Methods: An interview with a COPD case manager was conducted to better understand the established program at the COPD clinic. Information gathered from a literature review in conjunction with the interview results were used collectively to develop a screening tool. Pre and post-educational surveys were conducted among respiratory therapist to determine the focus & effectiveness of medication education.

Results: The interview revealed that medication adherence and effectiveness are important factors in helping patients better manage their disease. Survey results revealed that medication therapy for managing the disease is an important factor; yet, there are still barriers to medication and effectiveness among the patient population. Literature revealed that medication compliance is key in reducing serious health complications. Results from the post-education survey are still pending.

Conclusion: A screening criteria and scoring algorithm were developed for respiratory medications along with an educational component to help respiratory therapists utilize the tool. Further monitoring is recommended following implementation to determine the effectiveness of both the index tool and the education.

Abstract #840; Health Sciences

Title: Usage of Heated High Flow Nasal Cannula

Student Author(s): Ruth Underwood

Faculty Advisor: Dr. Amanda Dexter

Department: Kinesiology

Background: Usage of heated high flow nasal cannula. From a stand point of educating staff and respiratory therapy students, providing in-services does help increase knowledge of using such devices. Individuals working with patients requiring heated high flow nasal cannula may not be fully educated on using the devices in certain circumstances/diseases or age ranges. Education on using any device such as heated high flow is important to the success of its usage. The project will also include some comparison between using heated high flow nasal cannula and other noninvasive ventilation (NIV) devices. Usage of heated high flow nasal cannula has been beneficial to certain patients with certain diseases over other NIV devices.

Methods: Fellow staff members at a small community hospital were given surveys on their current knowledge of using heated high flow nasal cannula. These individuals were also provided an in-service after the initial survey. This group of individuals was given a post-survey as well to gain knowledge of what was learned from the in service. The same surveys were sent to both first year and second-year respiratory therapy students. Information obtained included knowledge on usage of heated high flow as well as the other NIV devices that could be used.

Results: Most staff members and second-year students answered questions accurately. Some staff members have never had experience using heated high flow nasal cannula. All of the second year students have had experience in clinical. The information from the first year students showed that they did not have much knowledge of the subject. They have had very little education on these devices up to this present time in class. These students have only been in the clinical setting for six weeks. Data did not show much difference when using other NIV devices compared to the heated high flow nasal cannula. Articles used that pertained to information gathered from clinical trials did not prove any difference as well.

Conclusion: Providing education for using devices such as heated high flow nasal cannula both inside and outside of the classroom is beneficial. More education and exposure provided to individuals will help increase individuals knowledge. Experience using other NIV devices versus using heated high flow nasal cannula may provide more information.

CE - Community Engaged
NC - North Carolina

G - Global
S - Sustainability

H - Honors
U - Charlotte

Abstract #841; Health Sciences

Title: Can the Use of Assist Control Mode with Volume guarantee decrease Chronic Lung Disease in the Neonatal Population?

Student Author(s): Brandy Underwood

Faculty Advisor: Dr. Michael Troxell

Department: Respiratory Therapy

Exposing premature lungs to high concentrations of oxygen and positive pressure ventilation can result in stress and ventilator-induced lung injury. This results in chronic lung disease (CLD) or Bronchopulmonary Dysplasia (BPD). Prevention is important, and the goal is to protect the airway against lung injury and the development of CLD. My clinical question involves incorporating the use of a volume targeted strategy mode along with assist-control mode to prevent or reduce the risk of BPD in neonates. A volume targeted mode of ventilation, such as Assist Control Volume Guarantee (AC/VG) can be used to avoid ventilator-induced lung injury. As part of my research, I conducted a survey to fellow employees and classmates from across the state on their experience with the use of this mode and found that many facilities don't utilize this as their NICUs as a first line mode. There are many benefits to using AC/VG in preterm neonates. The articles reviewed for this research states that this approach can help improve ventilator asynchrony and can shorten time on the ventilator and reduce incidences of lung injury, both which can prevent chronic lung disease in babies at risk for chronic lung disease.

Abstract #842; Health Sciences

Title: The Role of the Respiratory Therapist in the NICU

Student Author(s): James Vang

Faculty Advisor: Dr. Michael Troxell

Department: Kinesiology

Background: My paper is about what type or kind of role is for the Respiratory Therapist behind the different kinds of level of NICU that any hospital has to offer. There are many levels of NICU, meaning that there are different types of treatment and different age group that these levels of NICU can take. For example, Level 1 NICU, they don't take any babies younger than 36 weeks gestation, or care for healthy full-term babies.

Method: The method that I am proposing to research for my paper is providing surveys and questionnaires from my fellow respiratory therapists, managers, and neonatologist in North Carolina about what level NICU is at their facility, why type of ventilation do they do, what modes of ventilation, what types of deliveries they attend and if they attend any at all.

Results: The results will be from the surveys and questionnaires that I have sent.

Conclusion: My conclusion will be based on how important the role of the respiratory therapist is to these babies, whether they are full-term or pre-term.

Humanities

CE-Community Engaged
NC-North Carolina

G-Global
S-Sustainability

H-Honors
U-Charlotte

Abstract #843; Humanities

Title: Bike Shares in the Rise of Electric Scooters

Student Author(s): Maria Ysabelle Cruzat **G, H, S, NC, U**

Faculty Advisor: Dr. Heather Smith

Department: Geography and Earth Sciences

Transportation continues to play an important role in economic development, globalization, politics, the environment, and help shape the way societies develop. Globally, bike share usage has increased and has helped provide solutions to issues such as the first mile/last mile problem and polluting transport practices along with challenges such as loitering and load balancing. Most recently, electric scooters have been implemented in Charlotte's urban transport system. With information gathered from bike share and electric scooter companies, this research looks into how bike shares and electric scooters have shaped the urban transportation system of the city and addresses ways in which they can better be integrated.

CE-Community Engaged
NC-North Carolina

G-Global
S-Sustainability

H-Honors
U-Charlotte

Abstract #844; Humanities

Title: The Three Towers of Orthodoxy: Nicaea, Trebizond, Epirus.

Student Author(s): John Holmes **G**

Faculty Advisor: Dr. Robert McEachnie

Department: History Department

The central research question is how the Orthodox Church in the Byzantine Empire was affected by the Fourth Crusade. With the Byzantine ideology espousing the idea of the empire being the universal defender of the one, true faith, the creation of three separate Byzantine successor states poses a challenge to that ideology in both a secular and theological sense. By analyzing the discourses between the secular and religious authorities of Trebizond, Nicaea, and Epirus, the paper will also be able to weigh-in on ongoing debates in the Byzantine historiography regarding whether the Orthodox Church was a tool of the Byzantine Emperor or if the Byzantine Emperor was subservient to the church itself.

The methodology will emulate that of Averil Cameron, which is to analyze the discourses between Orthodox theologians and Byzantine autocrats, then to analyze the discourses between the separate states. A number of histories, such as Choniates' *Historia* will also be examined for elements of religion versus state struggles. As of yet, there are no expected conclusions, but they will be discussed within the context of the Russian, Greek, and Orthodox churches' mutual excommunications of 2018.

Abstract #845; Humanities

Title: Impact of the Immigration Experience on Language Usage

Student Author(s): Misty Morin **G, H**

Faculty Advisor: Dr. Olga Padilla-Falto

Department: Spanish

The primary objective of this research is to examine how the immigration process affects the language skills and abilities of Latin American immigrants. Through the utilization of literary review, personal interviews, and surveys that gather quantitative data, I hope to give a voice to individuals who have been through the life-changing ordeal of immigration into the United States of America, while investigating the linguistic shifts that have taken place since their arrival. In doing so, this research aims to combat the dehumanization of immigrants, and the notion that “just learning English in America” is a more complicated matter than most think.

CE-Community Engaged
NC-North Carolina

G-Global
S-Sustainability

H-Honors
U-Charlotte

Abstract #846; Humanities

Title: From Harry Potter to School Shootings

Student Author(s): Kalei Woodford

Faculty Advisor: Dr. Matthew Rowney

Department: English

The purpose of this paper was to show how the events of Harry Potter and the Order of the Phoenix mirror the involvement of the Parkland, Florida students, who were victims of a school shooting last year, in gun reform debates. To research this, I used multiple sources ranging from NBC news, Teen Vogue, and Social Science Journals. I found articles relating to how the students, mainly David Hogg and Emma Gonzalez, were treated by politicians and organizations such as the National Rifle Association and how these responses were on par with the way Umbridge punished students who spoke out against her and the Ministry of Magic. The NRA does not want to admit that there is a problem with gun laws in the U.S. and how those laws allow shootings like the Parkland one to occur. Fudge, the Minister of Magic, ignored all the signs that Voldemort was back which led to the students teaching themselves defense spells because no one else would help them. Just like the group Harry, Hermione, and Ron formed, the Parkland students joined together to push for stricter gun laws to prevent another school shooting.

Math and Computer Science

CE-Community Engaged
NC-North Carolina

G-Global
S-Sustainability

H-Honors
U-Charlotte

Abstract #847; Math and Computer Sciences

Title: TeamUNCC - The Code/Natural Language Challenge

Student Author(s): Erfan Al-Hossami, Brandon Beckwith, and Mariah Olson

Faculty Advisor: Dr. Samira Shaikh

Department: Computer Science

The CoNaLa challenge is a competition organized by Carnegie Mellon University. In this competition, models are expected to perform a machine translation task and translate English sentences also known as 'intents' into Python code snippets. Performance in this competition is measured using BLEU-4 scores, indicating how well a system is able to translate a given source into a target language. In this research project, we present TeamUNCC's model capable of translating English to Python. Our novel approach consists of various pre and post-processing layers, as well as, a deep learning model. Our deep learning model is built using the brand-new eXtensible Neural Machine Translation (xnmt) library. In our proposed model, English sentences are embedded into a lookup word-embeddings. Furthermore, we apply a Seq2Seq encoder-decoder architecture using Bi-LSTM neural networks. Our performance results show promising improvements over the baseline models, which scored around 10.58 and 14.72. Currently, TeamUNCC ranks second with a BLEU-4 score of 20.97.

Abstract #848; Math and Computer Sciences

Title: BRIDGES

Student Author(s): Allie Beckman and Alec Goncharow **NC, U**

Faculty Advisor: Dr. Kalpathi Subramanian

Department: Computer Science

In this poster, we present BRIDGES, a software infrastructure for programming assignments in data structures and algorithms courses, which have been in use at multiple institutions over the past 2 years. BRIDGES was developed to engage students at the sophomore level in critical foundational courses, to improve retention and reduce attrition rates. BRIDGES provides two key capabilities: (1) easy to use interface to real-world datasets spanning social networks, entertainment (movies on IMDB, song lyrics), scientific data (real-time USGS Earthquake Data), civic issues (crime data), and literature (books); and (2) a visualization of the acquired data can be used in assignments by students to populate their implemented data structures, including the capability to bring out attributes of the dataset. The visualizations are displayed on the BRIDGES website and are easily shared (with family, friends, peers, etc) via a weblink. Visitors will see several example datasets being used in data structure visualizations using BRIDGES, and see how BRIDGES can be used in their own courses, as well as partner with the BRIDGES team.

Abstract #849; Math and Computer Sciences

Title: Investigating the Uses of Technology to Fight Government Corruption

Student Author(s): Fredy Domleu **G**

Faculty Advisor: Dr. Erik Byker

Department: Reading and Elementary Education

The purpose of this research poster is to investigate and compare the uses of computer technology on digital devices in order to fight government corruption. For my research, I examine a case study of my country: Cameroun. Located in central-West Africa, Cameroun has extensive corruption that seems to go unchecked. The corruption is in direct contrast to the United Nations' Sustainable Development Goal #16, which promotes peaceful and inclusive societies for sustainable development in order to provide access to justice for all and build effective, accountable and inclusive institutions. Using a case study and literature review methodology, I investigate the types of digital software available to empower citizens to fight government and financial corruption. This research has been a life-long learning inquiry for me as I am upset that Cameroun is deemed as the most corrupt country in the world. The goal of my research study is to help my government to solve the problem of financial corruption; because corruption leads to injustice and fosters inequalities. In the discussion part of my research findings, I describe and critique ways to continue to enhance software--for digital and handheld devices--that equips citizens and government leaders to act as a watchdog for government and financial corruption. I conclude with a personal recommendation to create something like an intranet, where people can avoid hand-to-hand transactions, which are more susceptible to bribery.

CE - Community Engaged
NC - North Carolina

G - Global
S - Sustainability

H - Honors
U - Charlotte

Abstract #850; Math and Computer Sciences

Title: Valuating and the Rationality of Exercising Options of Variable Annuities

Student Author(s): Riley Jones **H**

Faculty Advisor: Dr. Adriana Ocejo

Department: Mathematics and Statistics

A variable annuity is a type of savings policy typically offered by insurance companies. The policyholder makes an upfront payment to the insurance company and, in return, the insurance company is required to make a series of payments starting at an agreed upon date. For a higher premium, many insurance companies offer additional guarantees or options which protect policyholders from various market risks. My research is centered around creating a pricing framework for two of these options: the guaranteed minimum income benefit and the reset option. The framework will be used to explore how various parameters and assumptions affect the pricing of these options. Additionally, I will assess how external factors, such as interest rates, affect the rationality of exercising these options. This will be able to provide insight to both the policyholder and policy writer on how their future projections on the performance of the stock market and interest rates should guide their respective actions of exercising and pricing variable annuity options. This can help provide details into the value of adding options to a variable annuity for companies that are looking to make variable annuity policies more attractive in a competitive market.

Abstract #851; Math and Computer Sciences

Title: Risky Business: Evaluating VaR

Student Author(s): Sierra Laine

Faculty Advisor: Dr. Eliana Christou

Department: Math

Value-at-Risk is a statistic used by banks and other financial institutions to assess and measure risk for investments, potential business ventures, and is also used for complying with government regulation. Value-at-Risk (VaR) is a dollar amount that one stands to lose for a given investment with a certain probability, τ , where τ is typically fixed at either .01, .025, and .05. Using publically available historical data of five stock indices from two different five year time periods, (2011-2016) and (2004-2009), several methods were used to build models for VaR. The two time periods allowed models to be built both during a period of financial stability, (2011-2016) and during a period with more market irregularities, (2004-2009) i.e. the financial crisis of 2008 and its aftermath. The methods consisted of parametric time series and quantile regression techniques. The various models were then assessed for predictive accuracy when compared with actual data and were then also back tested. This project has summarized model performance among both time periods.

Abstract #852; Math and Computer Sciences

Title: On-campus Parking Recommendation System with Map-Based Traffic Patterns and Parking Availability Data

Student Author(s): Bonaventure Raj, Tyler Crowe,
Thao Tran, Stefan Dybka, and Bryce Kane **U**

Faculty Advisor: Dr. Mohsen Dorodchi

Department: Computer Science

Parking at the University of North Carolina at Charlotte has created troubles for many students on campus. Whether it be difficulty locating an available spot quickly, getting stuck in traffic, or even potentially having collisions when competing for a spot. All these risks are costly for students and the college itself. Our project aims to solve these problems by analyzing traffic and parking patterns on campus. We accumulate real-time traffic data using the Bing Map API and parking availability data from PATS. The data collected is then analyzed using machine learning techniques to generate a recommendation for an ideal route and parking spot that fits current traffic conditions, lot availability, and the students' schedule. This recommendation system can be delivered via a mobile app or a web app for greater accessibility.

Science, Technology, and Engineering

CE-Community Engaged
NC-North Carolina

G-Global
S-Sustainability

H-Honors
U-Charlotte

Abstract #853; Science, Technology, and Engineering

Title: Synthesis of the First Telone Complexes of Silver

Student Author(s): Kirk John Arcena

Faculty Advisor: Dr. Daniel Rabinovich

Department: Chemistry

We have prepared in the several past complexes of silver(I) supported by Nheterocyclic thione (NHT) and selone (NHSe) ligands, some of which exhibit potent anticancer activity. These compounds contain unusual two-coordinate cationic complexes $[Ag(IArE)_2]^+$ (E = S, Se), the identity of which has been confirmed in several cases using single-crystal X-ray diffraction. We have now extended the scope of this project by preparing the corresponding tellurium analogues, namely the Nheterocyclic telone (NHTe) ligands IArTe (Ar = Xy, Mes, Dipp) and their silver derivatives $[Ag(IArTe)_2]X$ (X = NO₃, BF₄, ClO₄). The telone compounds appear to be more thermally sensitive than their sulfur and selenium analogues. Significantly, these compounds are the first telone complexes of silver to be ever isolated and this presentation will also include a comparison of these recent results with previous work completed for the thione and selone analogues.

Abstract #854; Science, Technology, and Engineering

Title: The Relative Importance of IFI16 in Propagating Pro-Inflammatory Responses upon Foreign DNA Challenge in IFI16 Deficient Human Astrocytes

Student Author(s): Rohit Arja **H**

Faculty Advisor: Dr. Ian Marriott

Department: Biological Sciences

Encephalitis is inflammation of the brain tissue, most commonly associated with viral infections such as herpes simplex virus-1 (HSV-1). Although inflammation is a natural immune response to infection, it can be fatal in the central nervous system (CNS). The first responders in the CNS are glial cells, specifically astrocytes and microglia, which can secrete pro-inflammatory cytokines following viral challenge. However, the mechanisms by which glial cells sense DNA viruses, such as HSV-1, are not well understood. It may be that glia can sense foreign DNA through the expression of intracellular DNA sensors, such as Interferon inducible protein-16 (IFI16). However, little is known about this DNA sensors in human glia. Therefore, we seek to determine the relative importance of IFI16 in detecting foreign DNA in human glia. To determine the importance of IFI16 we are using CRISPR/Cas9 technology to the knockout expression of this gene. The IFI16 deficient glia will then be treated with bDNA, a viral DNA mimetic. We will then look at the change in expression of pro-inflammatory cytokines, such as IL-6. This investigation will determine whether IFI16 alone is necessary for foreign DNA detection or whether other DNA sensors can compensate for the loss of this sensor.

Abstract #855; Science, Technology, and Engineering

Title: Application of Hexacoordinate Silicon Complexes in Organic Light Emitting Diodes and Photovoltaics

Student Author(s): Kevin Boyle

Faculty Advisor: Dr. Michael Walter

Department: Chemistry

Organic electronic devices have become increasingly important over the past decade, as smart phone technology and the need for solar energy has grown. For example, organic light emitting diodes (OLEDs) are a popular choice in electronic displays due to their light weight and higher quality images. Current devices, however, are composed of rare earth elements, that are less abundant, more expensive, and toxic. As a result, safer, longer lasting, and more efficient materials have become necessary to create better devices. Hexacoordinate silicon materials are being investigated as a low cost, high efficiency, and earth-abundant alternative to current materials in OLEDs and solar cells. In this work, OLEDs and solar cells have been fabricated with hexacoordinate silicon materials, using vacuum deposition and solution processing, making it compatible with commercial technologies.

Abstract #856; Science, Technology, and Engineering

Title: Experimental and Computational Study of the Flow Structure around NACA 63-215 and NREL S814 Hydrofoils in a Water Channel Using Tomo-PIV

Student Author(s): Nicholas Brummitt **NC, S, U**

Faculty Advisor: Dr. Navid Goudarzi

Department: Mechanical Engineering Technology

Ocean Current Turbines (OCTs) is a novel technology used to extract power from a renewable source and can be incorporated into the local power grid for civilian and industrial use. The efficiency at which power is transferred depends on numerous factors including flow incident angle on the turbine blades, turbulence intensity, and blade geometry. Simulation of complex blade geometries allows the analysis of hydrodynamic characteristics, such as lift and drag, around OCT blades. A Computational Fluid Dynamics (CFD) simulation is conducted on hydrofoils with ANSYS Fluent 19 to further examine these hydrodynamic characteristics. Experimental investigations are performed on the unsteady flow field near a NACA 63-215 and NREL S814 hydrofoils in a closed-water channel at different flow velocities. Near-wake flow structure analyses are crucial in studying the performance of OCTs. A Tomographic Particle Image Velocimetry (TomoPIV) is used to determine the velocity field in the near-wake region of the studied hydrofoils.

Abstract #857; Science, Technology, and Engineering

Title: New Silver Complexes with a Bis(thione) Ligand

Student Author(s): Thomas Cole

Faculty Advisor: Dr. Dan Rabinovich

Department: Chemistry

This presentation describes the synthesis of the first silver(I) complexes supported by a bis(mercaptoimidazolyl)xylene ligand (o-BmxMe) that we have previously used to prepare derivatives of other main group and transition metals. Although we set out to prepare mononuclear complexes containing two such ligands, $[Ag(o-BmxMe)_2]X$ ($X = NO_3, BF_4, ClO_4$), results obtained so far suggest the unexpected formation of dinuclear complexes with a 2:3 metal-to-ligand stoichiometry, $[Ag_2(o-BmxMe)_3]X_2$. This presentation will outline the two-step synthesis of the ligand, the preparation, and characterization of its silver complexes, and future directions of research, including the use of ligands with different substituents on the nitrogen atoms and their selenium analogs.

Abstract #858; Science, Technology, and Engineering

Title: Characteristics of Nocturnal Precipitation Following a Strong Late-Afternoon Urban Heat Island across the Charlotte, North Carolina, Metropolitan Region

Student Author(s): Taylor Grace **U**

Faculty Advisor: Dr. Matthew Eastin

Department: Geography and Earth Sciences

Rapid urbanization has been occurring in Charlotte and on a global scale for several decades. The change of natural surfaces (e.g., grassland and forestry) to impermeable surfaces (e.g., concrete and pavement) creates localized heating and thus warmer surface temperatures in urban locations compared to surrounding rural areas. This so-called urban heat island (UHI) can cause significant climatological and socioeconomic impacts, including altered growing seasons, increased energy consumption, and decreased human health and comfort. Moreover, UHIs generate ascending motion over urban cores, and thus can initiate severe weather, enhance precipitation, and increase flood risk. Previous studies have presented evidence of increased severe weather and precipitation downwind of large cities in humid climates. In this study, observations from 12 surface weather stations across the Charlotte area will be combined with archived radar, lightning, and weather balloon observations to document the evolution of late-afternoon and early-evening thunderstorms on six summer dates when a prominent UHI was present. Results from this study will provide a better understanding of how UHIs can initiate/enhance storms and influence storm frequency within the Charlotte area.

Abstract #859; Science, Technology, and Engineering

Title: Benefits of Early Tracheostomy among Cervical Spinal Cord Injury Patients Requiring Mechanical Ventilation

Student Author(s): Michelle Grosso

Faculty Advisor: Dr. Amanda Dexter

Department: Department of Kinesiology

Background: This study was conducted to help determine if early tracheostomies (<7 days of mechanical ventilation) among cervical spinal cord patients requiring mechanical ventilation are beneficial, compared to >7 days.

Methods: The PubMed database was searched for studies that reflected on tracheostomies that were performed on cervical spinal cord injury patients. A variety of patient factors were looked at including age, sex, injury severity, GCS, respiratory complications, and American Spinal Injury Associate Impairment Scale score. A respiratory therapist was also interviewed who have previously published information on spinal cord patients. A survey was sent out to a physician who currently works at a level one trauma hospital that treats spinal cords to see when they perform tracheostomies.

Results: Among all the database studies, and interview data, early tracheostomies have been found to decrease hospital length of stay, which in turn decreased cost and mechanical ventilator days. The patient factors did not make a difference. Among the surveyed physicians there was some discrepancies on when to perform tracheostomies.

Conclusion: A Tracheostomy Placement protocol was created to aid physicians in determining when to perform tracheostomies on these cervical spinal cord injury patients. Further study is needed after the implementation to determine the effectiveness of the protocol.

Abstract #860; Science, Technology, and Engineering

Title: The Synthesis and Characterization of Sulfonated Thiazolothiazole Dyes for Solar Energy Storage Applications

Student Author(s): Natalie Herr and Nickolas A. Sayresmith

Faculty Advisor: Dr. Michael Walter

Department: Chemistry

The synthesis and characterization of water-soluble, N-dialkylsulfonated dipyrindinium thiazolothiazole (TTz) materials are reported. The synthetic methods for this compound have been examined using two different cyclic sultones to enable the alkylation. Both 1,3-propane sultone, and 1,4-butane sultone could be used to afford the desired dialkylated TTz dye material with varying yields and distribution of products (mono or dialkylated TTz). The dialkylsulfonated TTz has a strong blue fluorescence with a high fluorescence quantum yield. The sulfonated TTz compound was characterized by NMR, mass spectrometry, UV-visible absorbance, and fluorescence spectroscopy, and cyclic voltammetry. The electrochemical and light absorbing properties of this water-soluble TTz compound enables its application in a solar redox flow battery.

Abstract #861; Science, Technology, and Engineering

Title: Analysis of Macroinvertebrates and Other Freshwater Metrics for Pre and Post Restoration Comparison

Student Author(s): Haley Herrick

Faculty Advisor: Dr. Sandra Clinton

Department: Earth and Environmental Sciences

The focus of this project is to monitor freshwater metrics from pre- and post-restoration data. Stream restoration is a vital way of transforming degraded systems into more naturally functioning systems. The comparison of measured metrics will help to understand better the process behind why we want to restore urban streams. Metrics observed are the following: an abundance of EPT macroinvertebrates as bioindicators of water quality, water temperature, dissolved oxygen, and pH.

Abstract #862; Science, Technology, and Engineering

Title: Terrain Influences on Supercell Thunderstorms within the Appalachian Mountains

Student Author(s): Jan Ising

Faculty Advisor: Dr. Casey Davenport

Department: Geography and Earth Sciences

One area examined by atmospheric scientists is how a strong thunderstorm interacts with complex terrain like the Appalachian Mountains. While there have been a number of studies that have observed or simulated these over different types of orography, there are still questions remaining about how the interaction between the terrain and the storm influences storm evolution. In order to further the understanding in this field, this project investigates what promotes crossing across terrain and how that corresponds to strengthening and/or dissipating. One goal of this research is to aid forecasters in such areas of complex terrain during active severe weather outbreaks in providing background data so that accurate and timely forecasts can be produced. The project tasks include, acquiring crossing cases of strong thunderstorms, elevation data of the terrain and storm reports and correlating the three to try to find general patterns that could suggest whether or not crossing will occur. Expected results should try to answer what parameters need to be met in order to demonstrate a crossing/non-crossing behavior and how that contributes to aiding forecasters in severe events and the overall storm evolution.

Abstract #863; Science, Technology, and Engineering

Title: Synthesis of New Expanded-Ring Heterocyclic Thiones

Student Author(s): Maria Kalogeromitros and Patrick Sauser

Faculty Advisor: Dr. Dan Rabinovich

Department: Chemistry

The synthesis and characterization of three new N-heterocyclic thiones (NHT) ligands containing a fully saturated 1,3-diazepine ring and sterically-demanding aromatic substituents on the nitrogen atoms is described in this presentation. Our initial studies pertaining to the reactivity of these molecules abbreviated SDiazArS for simplicity (Ar = 2,6-xylyl, mesityl, or 2,6-diisopropylphenyl), will also be outlined. For example, they react with elemental iodine to form the corresponding dark red (SDiazArS)₂ adducts, which have likewise been characterized by a combination of analytical and spectroscopic methods. A summary of additional reactivity studies under consideration and our attempts to obtain single-crystals of these compounds suitable for X-ray diffraction studies will also be summarized in this presentation.

Abstract #864; Science, Technology, and Engineering

Title: Understanding Hsp70 isoform specificity in the DNA damage response

Student Author(s): Sarah Lotz and Laura Knighton

Faculty Advisor: Dr. Andrew Truman

Department: Biology

The Heat Shock Protein 70 (Hsp70) family of proteins are responsible for the folding of both newly synthesized and stress-damaged proteins. Hsp70s are highly conserved in all organisms, with each organism possessing multiple highly similar Hsp70 variants (isoforms). These isoforms have been previously thought to be identical in function but expressed differentially under heat stress. The model organism *Saccharomyces cerevisiae* (baker's yeast) express four Hsp70 isoforms Ssa1, 2, 3 and 4. Recent studies from our lab have demonstrated that cells require the yeast Hsp70 isoform Ssa1 to recover from DNA damage, but the role of the other Ssa isoforms has not been established. In this study, we have created yeast that constitutively expresses Ssa1, 2, 3 or 4 as the sole Hsp70 in the cell. We analyzed how each of these yeast strains responds to DNA damaging agents such as hydroxyurea, MMS, UV radiation and 5-fluorouracil. Interestingly, yeast expressing only Ssa3 or Ssa4 were compromised for their ability to respond to DNA damage. Going forward we will determine the mechanism behind this altered resistance by utilizing Ssa isoform chimeras and global interactomics.

Abstract #865; Science, Technology, and Engineering

Title: Effects of El Nino and La Nina on the Eastern United States

Student Author(s): Trevor Lowe **NC**

Faculty Advisor: Dr. Jack Scheff

Department: Meteorology

We investigated the different impacts that a La Nina or El Nino season bring to the East coast of the United States. We measured are how far from normal the temperatures and precipitation are depending on whether it is an El Nino or La Nina winter. We used recordings of temperature and precipitation during January and February as in December the impacts of El Nino and La Nina can be negligible as the weather patterns associated with El Nino and La Nina aren't in place. There are different ways to categorize an El Nino or La Nina as weak, moderate, strong, and in the case of El Nino, Very Strong. We analyzed every El Nino and La Nina event from 1950 to 2016 and took 46 case studies, which means 46 different years were analyzed during January and February. After analyzing the recorded change in temperature and precipitation from normal for those years, they were then separated according to the strength of the El Nino or La Nina event. To conclude, there were a lot of years following what was expected of an El Nino or La Nina winter and others that were not.

CE-Community Engaged
NC-North Carolina

G-Global
S-Sustainability

H-Honors
U-Charlotte

Abstract #866; Science, Technology, and Engineering

Title: The Hazards of Hog Farming in North Carolina **NC, S**

Student Author(s): Zach Margolis

Faculty Advisor: Dr. Alan Rauch

Department: English

Pork and good barbecue have become synonymous with North Carolina, but little thought is put into where it comes from. This project aims to enlighten the citizens of North Carolina and beyond the environmental and social effects of hog farming, and why our way of life as a state has to change.

Abstract #867; Science, Technology, and Engineering

Title: The Pleasure of Fairness? Exploring the Motivations of Fair Behavior Using the Dictator and Ultimatum Tasks

Student Author(s): Matthew McCue

Faculty Advisor: Dr. Sara Levens

Department: Psychological Sciences

Fairness is a central tenant of society, but individuals can vary greatly in their motivation to be fair. Some people may be fair because it gives them pleasure, while others may act fairly, not because it gives them pleasure, but because they feel socially obligated to do so (Mellers, Haselhuhn, Tetlock, Silva, & Isen, 2010). In social situations, it is possible that other factors such as punishment sensitivity and inhibitory control may contribute to fairness motivations. To explore this, 198 participants completed a battery of questionnaires including the BIS/BAS scale and computerized versions of the Dictator and Ultimatum tasks in which they rated how pleasurable each choice option was for themselves and their partner. Pleasure ratings were correlated with absolute fairness to create a fairness-pleasure value. A task (Dictator, Ultimatum) by perspective (Self, Partner) repeated measure ANOVA was conducted on fairness-pleasure values with BIS scores entered as a continuous independent variable. Results reveal a significant Task by BIS interaction, $F(1,179) = 7.542, p < .01$. Follow up correlation analysis revealed that greater punishment sensitivity and inhibitory control is associated with a greater link between pleasure and fairness in the Ultimatum task ($r(194) = .2, p < .01$), but not the Dictator task. This pattern of findings suggests that individuals' sensitive to negative consequences may reframe fair behavior as pleasurable in socially accountable situations, because it may be socially desirable to do so, not because they find acting fairly inherently pleasurable.

Abstract #868; Science, Technology, and Engineering

Title: Testing the Functionality of Lysozyme after Desiccation by Light Assisted Drying

Student Author(s): Riley McKeough, Daniel Furr, and
Madison Young

Faculty Advisor: Dr. Susan Trammell

Department: Physics

Protein-based therapeutics play an important role in modern medicine, such as cancer treatment. The current preservation method for proteins is freeze-drying, which is expensive and presents difficulty in maintaining protein functionality during processing. Light-assisted drying (LAD) provides a new method of preservation with potential for room temperature storage. LAD uses a near-infrared laser to desiccate a protein suspended in a trehalose solution. Rapid desiccation of the solution by LAD forms an amorphous trehalose matrix for the preservation of the protein. The goal of this research was to test the unfolding of a protein, lysozyme, after LAD processing. Differential Scanning Microcalorimetry (DSC) was used to measure and compare the unfolding temperatures of lysozyme before and after LAD processing. Samples were 40 μ L drops of 0.5mg/ml Lysozyme in 0.2M trehalose and 0.33X Phosphate Buffered Saline. The LAD processed samples were illuminated with a 1064nm laser in a low humidity chamber for 1 hour. The unfolding temperature of unprocessed lysozyme was measured at 73.26 $^{\circ}$ C, and the LAD processed at 73.24 $^{\circ}$ C. The LAD process showed no change in the unfolding temperature of LAD processed lysozyme. LAD is a promising method for the preservation of proteins for use in protein-based therapeutics.

Abstract #869; Science, Technology, and Engineering

Title: Exciton Diffusion of Zinc-Metallated Carboalkoxyphenylporphyrins

Student Author(s): Camilla Middleton and Karissa Ewing **NC, S**

Faculty Advisor: Dr. Michael Walter

Department: Chemistry

Dye-sensitized solar cells attract attention in the area of organic photovoltaics (OPV) due to their inexpensive cost, and solution-processability. Porphyrins are structural analogs to chlorophyll which assist in the process of photosynthesis. Once energy is captured from solar radiations; porphyrins have an accelerate energy-transfer that is a result of their broad absorption spectrum. As potential candidates, four free-base and zinc-metallated carboalkoxyphenylporphyrin derivatives are being synthesized and investigated for their molecular orientation, absorption, fluorescence, and photoluminescent lifetimes to interpret their exciton diffusion properties. All in expectation to engineer efficient solar cells in active layers.

Abstract #870; Science, Technology, and Engineering

Title: Generating a Mouse Model of Mucin 1 (MUC1)-Positive Ovarian Carcinoma

Student Author(s): Chiagoziem Ngwadam **NC, U**

Faculty Advisor: Dr. Pinku Murkerjee

Department: Biological Sciences

Ovarian carcinoma is currently the fifth most common cause of cancer-related deaths in women in the United States. The high mortality rate is mostly due to late-stage diagnosis. Ovarian carcinoma usually goes undetected until it has spread into surrounding tissues in the pelvis and abdomen, at which point it is difficult to treat. Human mucin 1 (MUC1) is a glycoprotein that is over-expressed and under-glycosylated in epithelial cancers throughout the body, including the majority of ovarian carcinomas. Tumor-associated MUC1 can serve as a diagnostic indicator and a target for immunotherapies. The development of a MUC1-expressing model of ovarian carcinoma would aid these studies.

The goal of this project is to establish a model of MUC1-expressing ovarian carcinoma that can be studied in vitro and in vivo. Mouse ovarian carcinoma (MOVCAR) cells share many features with human ovarian carcinoma. We have used Lipofectamine transfection to create MOVCAR cells that stably express human MUC1 (MOVCAR;MUC1 cells). We will compare the growth rate and morphology of MOVCAR;MUC1 cells and MUC1-null MOVCAR cells. We will also inject MOVCAR;MUC1 cells subcutaneously into athymic nude mice and immune-competent human MUC1 transgenic (MUC1.Tg) mice and measure tumor growth over time. If we observe progressive tumor growth, then we will be able to use this model to study potential MUC1-targeted immunotherapies for ovarian cancer.

CE - Community Engaged
NC - North Carolina

G - Global
S - Sustainability

H - Honors
U - Charlotte

Abstract #871; Science, Technology, and Engineering

Title: Silver Complexes with Saturated Five-Membered Chalcogenones

Student Author(s): Leyna Pence and Rachel Nguyen **H**

Faculty Advisor: Dr. Daniel Rabinovich

Department: Chemistry

The synthesis and reactivity of N-heterocyclic thione (NHT) and selone (NHSe) ligands featuring a saturated backbone and sterically demanding aryl substituents on the nitrogen atoms is outlined in this work. Such compounds play a pivotal role in the quest for new coordination compounds that exhibit biological activity, including some that display potential antibacterial and anticancer properties. This presentation describes the synthesis and characterization of several new five-membered heterocyclic thione and selone ligands, which we abbreviate SIArE, and their reactivity towards closed-shell (d10) metal ions such as copper (I) and mercury (II). Moreover, our most recent work involves the preparation and characterization of new silver (I) complexes of general formula $[Ag(SIArE)_2]X$ (E = S, Se; Ar = Xy, Mes, Dipp; X = NO₃, BF₄, ClO₄). The presence in these complexes of rare two-coordinate cationic species $[Ag(SIArE)_2]^+$ has been verified by single-crystal X-ray crystallography. This presentation will also include a structural comparison with analogous silver complexes prepared with the closely-related unsaturated ligands IArE, which exhibit potent anticancer activity.

Abstract #872; Science, Technology, and Engineering

Title: Silver complexes with Saturated Five-Membered Chalcogenones

Student Author(s): Jessica Pennington **H**

Faculty Advisor: Dr. Daniel Rabinovich

Department: Chemistry

There are several metal-based drugs undergoing clinical trials or already on the market that utilize platinum (II) or ruthenium (II) coordination complexes to target cancer cells in the body. However, the many detrimental side effects these drugs exhibit continue to inspire the search for other compounds with anticancer activity. Silver (I) derivatives, known for their antibacterial properties and relatively low toxicity, shows great potential as an alternative source of metal-based drugs. The research project outlined in this presentation has two primary objectives: first, to synthesize heterocyclic thione and selenone ligands, and second, to bind these ligands to silver salts. Thus, described herein is the synthesis of ligands with general formula SpymArE, where Ar = 2,6-dimethylphenyl (Xy), 2,4,6-trimethylphenyl (Mes), or 2,6-diisopropylphenyl (Dipp) and E = S or Se. These ligands, in turn, are bound to various silver (I) salts to form complexes [Ag(SpymArE)₂]X, where X= NO₃, BF₄, or ClO₄. The project involves the synthesis and complete characterization of the target silver (I) compounds, including the use of nuclear magnetic resonance (NMR) spectroscopy and elemental analysis to assess the purity of the isolated products. Future work will be centered on testing the biological activity of these complexes, particularly against a variety of cancer cell lines.

Abstract #873; Science, Technology, and Engineering

Title: Synthesis and Characterization of Diaryl-thiazolothiazole Compounds

Student Author(s): Cynthia Quan and Zac Taylor

Faculty Advisor: Dr. Michael Walter

Department: Chemistry

The synthesis and characterization of diarylthiazolothiazole compounds were carried out, such as di(2-thiophenyl)thiazolothiazole, di(2-benzothiophenyl)thiazolothiazole, di(2-furyl)thiazolothiazole, di(9-anthracenyl)thiazolothiazole, di(2-fluorenyl)thiazolothiazole, dibenzylthiazolothiazole, and diphenylthiazolothiazole. The crystallization into long single crystals were attempted in hopes of obtaining electron mobility and other photoelectrical physical properties by probing light through with metal contacts. Purity of products were examined using a variety of characterization methods such as TLC, ¹H NMR spectroscopy, and MALDI spectroscopy.

Abstract #874; Science, Technology, and Engineering

Title: Characterization of Fluorescent Nucleic Acid - Silver Nanoclusters

Student Author(s): Lewis Rolband, Maya Hunter, Alanna Hutchinson-Lundy, Morgan Chandler, Kirill Afonin, and Caryn Striplin

Faculty Advisor: Dr. Joanna Krueger

Department: Chemistry

Silver nanoclusters (AgNCs) are small silver aggregates comprised of 3-25 silver atoms. Single-stranded nucleic acid (DNA or RNA) can act as a scaffold for AgNCs, which allows uniform aggregation of the elemental silver. DNA-bound AgNCs display highly sequence dependent optical properties, and this property allows them to be excellent sensors, ideal for biological imaging and single molecule studies. Very little structural characterization of DNA-AgNCs is available, however. Our goal is to analyze a DNA-AgNC through size exclusion chromatography, followed by initial characterization with multi-angle light scattering (MALS). We will also develop a purification scheme for DNA-AgNCs. Lastly, small-angle x-ray scattering (SAXS) will be used to explore the nucleic acid structure and to use wide-angle x-ray scattering data to obtain silver-silver distances within the nanoclusters. The MALS and SAXS data of the RNA-bound AgNCs will provide a deeper understanding of their structural characterization and will, in turn, expedite their use in various fields as biosensors, cancer therapeutics, and other applications within the developing field of DNA nanotechnology.

Abstract #875; Science, Technology, and Engineering

Title: Bacterial Distribution during Sea Anemone Development

Student Author(s): Jason Samaroo and Tyler J. Carrier **H**

Faculty Advisor: Dr. Adam Reitzel

Department: Chemistry

Symbiosis is a growing field of research owing to widely recognized relationships between animals and microbes (e.g., bacteria, archaea, viruses, and fungi). Over the last few decades, it has been shown that these microbial communities are established during early development and exhibit taxonomic shifts in response to changes in the environment over the span of an animal's life. Where microbial symbionts are located on the animal host may provide functional information about these symbioses and how they may, for example, impact growth and development. Considering whether biological and ecological factors, such as exposure to toxic metals, affect spatial colonization dynamics may, thus, lend insight into the plasticity of animal-microbe symbioses. Using the widely-studied sea anemone *Nematostella vectensis* as our study organism, I propose to investigate how the spatial location of bacteria changes during development and when exposed to toxins. Through fluorescent identification of bacteria and microscopy, we can spatially locate the bacteria associated with *N. vectensis* during developmental stages. This leads me to hypothesize that exposure to copper, a common metal pollutant, will impact the spatial distribution of bacterial symbionts associated with *N. vectensis*, making the patterns of bacterial colonization more scattered throughout key developmental landmarks.

Abstract #876; Science, Technology, and Engineering

Title: The Synthesis, Characterization, and Electrochromic Properties of Highly fluorescent N,N'-Dibenzylated Thiazolothiazole Viologens

Student Author(s): Kristin Sandor, Alexis N. Woodward, and Joshua I.Chabeda

Faculty Advisor: Dr. Michael Walter

Department: Chemistry

The electrochromic, and photochemical characterization of a group of highly fluorescent, N,N'-dibenzylated dipyrindinium thiazolo[5,4-d] thiazole derivatives are reported. Benzylation was completed through the heating of the parent dipyridial TTz compound in the pertinent substituted benzyl bromide. Counter ion exchange with ammonium hexafluorophosphate provided the appropriate derivative for electrochemical analyses. Two closely spaced, reductions were observed at potentials sensitive to the benzyl group substituent. Significant electrochemical variations were seen with the proximity of the fluorinated benzyl groups to the TTz core. During two-electron reductions, solutions of the TTz derivatives exhibited strong and reversible electrochromism changing from clear to dark blue. The dibenzylated derivatives also display intense fluorescence and exhibit quantum yields as high as $\Phi_F = 0.96$. The unique electrochromic and optical properties displayed by these compounds make them good candidates for a wide range of electrochemical and photochemical applications.

Abstract #877; Science, Technology, and Engineering

Title: OAP-POSS-Porphyrin System as a Novel Candidate for Photodynamic Therapy

Student Author(s): Paolo Siano

Faculty Advisor: Dr. Juan Vivero-Escoto

Department: Chemistry

Photodynamic therapy (PDT) is a non-invasive therapy used for cancer treatment involving the activation of a photosensitizer by a specific wavelength of light. The activation of the photosensitizer results in a transition from a triplet oxygen state to a singlet oxygen state, which leads to apoptosis or necrosis of the cancerous cells. Porphyrins are widely used among the common photosensitizers. However, porphyrins are hydrophobic in solution, causing the molecules to aggregate inducing fluorescence quenching before reaching the targeted cells, and decreasing their efficiency in producing singlet oxygen species, decreasing its bioavailability. Polyhedral oligomeric silsesquioxanes (POSS) are a group of biocompatible and biodegradable silica cages, which are employed to deliver photosensitizers to carry cancerous cells without inducing premature quenching. The silica cage is small in size, approximately 1 nm, and can readily penetrate the cells, making them highly applicable for therapeutic delivery. In my research project, I have synthesized 5-(4-carboxyphenyl) 10,15,20-triphenylporphyrin and octa-aminopropyl-POSS. I have then reacted them to test how the quenching efficiency, of the POSS-porphyrin molecule, compared to the quenching efficiency of the porphyrin molecule alone.

Abstract #878; Science, Technology, and Engineering

Title: Benefits of E-Textbooks on College Campuses

Student Author(s): Annie Sung **H, NC, CE**

Faculty Advisor: Dr. Albert Wray

Department: Honors College- University Writing

The purpose of my research project was to investigate the reasons behind the lack of e-textbooks on college campuses and better educate the general public about student views of the topic. In the past decade, there has been a significant increase in research conducted on the effects of e-textbooks on student learning and overall student success. Throughout higher education, student and faculty utilization of technology have become much more prevalent, but, according to my research and multiple other studies conducted, there are still major hesitations and uncertainties when it comes to the use of e-textbooks. For this research, surveys were conducted through the Google Forms platform in which random students throughout ten different college campuses throughout the United States were asked a series of questions related to their understanding, attitudes, and personal experiences surrounding e-textbooks. There were a number of conclusions that were found from the research including data suggesting that while a majority of students prefer e-textbooks over their physical counterparts, they are not being provided enough access to use these expanding resources due to a number of factors including a lack of faculty partnership in e-textbook usage.

CE - Community Engaged
NC - North Carolina

G - Global
S - Sustainability

H - Honors
U - Charlotte

Abstract #879; Science, Technology, and Engineering

Title: Understanding the Role of Hsp70 Rimerization in Proteostasis

Student Author(s): Jade Takakuwa and Nitika

Faculty Advisor: Dr. Andrew Truman

Department: Biological Sciences

Heat Shock Protein 70 (Hsp70) is an evolutionarily well-conserved molecular chaperone that is critical in all organisms for the folding and activation of cellular proteins (proteostasis). While several studies have indicated that Hsp70 molecules can bind together in pairs (dimerization), the majority of these studies have been performed on purified Hsp70 protein in non-biologically relevant conditions. Recent mass spectrometry data from our lab has shown that yeast Hsp70 (Ssa1) forms dimers in cells, but the conditions in which this occurs remains to be determined. In this study, we evaluated the interaction between two tagged versions of Ssa1 (GFP and HIS6- tagged) by co-immunoprecipitation under a variety of stress conditions that included heat shock, nutrient deprivation, UV exposure and the DNA damaging agents MMS and hydroxyurea. In understanding the conditions that promote Hsp70 dimerization, we hope to decipher the role of Hsp70 in its biological function.

Abstract #880; Science, Technology, and Engineering

Title: Using a Native Pollinator Garden to Increase Ecological Literacy in College Students at the University of North Carolina at Charlotte

Student Author(s): Angela Duong, Thomas Ferry, Melissa Hatley, Jack Morin, Aikhahn Nguyen, Roya Tawkaliyar, Kevin Coffey, and Summer Bond **CE, NC, U, S**

Faculty Advisor: Dr. Carrie Wells

Department: Biological Sciences

Scientific illiteracy can often be attributed to the lack of intellectual curiosity brought on by the absence of engagement opportunities. Botanical illiteracy, or “plant blindness” result from the interaction of many factors, including disinterest in plants species and insufficient exposure to plant science before students reach college. For the purposes of this study, we were interested in measuring how student participation in hands-on, gardening activities on UNCC campus impacts their botanical literacy and their perspective of the ecological importance of native plants and pollinators. To analyze these variables, pre- and post-test were administered to participants following a guided gardening experience. These tests consist of 10 questions that range from conceptual to the participant’s personal beliefs on the status of native pollinators and plants. We predicted that the participants who take part in the garden planting will show increased rates in their general knowledge and appreciation of local plants and pollinators compared to the group who will not participate. In addition, we expected that the students who are Biology majors would have higher rates of prior knowledge reflected in their pre-test, but should still demonstrate improvement in their post-test.

CE - Community Engaged
NC - North Carolina

G - Global
S - Sustainability

H - Honors
U - Charlotte

Social Sciences

CE-Community Engaged
NC-North Carolina

G-Global
S-Sustainability

H-Honors
U-Charlotte

Abstract #881; Social Sciences

Title: Repression, Stress and Nightmares: Is Freud's Theory of Dreams Making a Comeback?

Student Author(s): Sydney Barngrover

Faculty Advisor: Dr. Hannah Peach

Department: Psychological Sciences

College students are arguably under more stress than the average individual. This stress can interact with the subconscious state and coping skills in a variety of unpredictable ways. A sample of 103 college students at the University of North Carolina at Charlotte reported very unusual and distinct findings; surprisingly, higher amounts of stress are significantly negatively associated with post-traumatic stress disorder symptoms; the more stress that is experienced, the less an individual reports PTSD symptoms, $r(103) = -.348$, $p = .000$. Subsequently, frequent nightmares are significantly associated with more stress, $r(103) = .268$, $p = .006$, but less PTSD symptoms, $r(103) = -.198$, $p = .046$. Based on these correlational analyses that go against the trends, it is plausible that college students are more open about their stress, but at the same time repress significant traumatic events. It is speculated that nightmares could be the subconscious "coping skill" of repressed trauma, where this PTSD could come forth in ones sleep and subconscious state that the conscious mind is not working through. This would then lead to lower amounts of reported PTSD but create higher levels of nightmares and current stress (not claiming causality). Was Freud's theory of dreams right all along?

Abstract #882; Social Sciences

Title: Similarity and Entitativity

Student Author(s): Jessica Corn

Faculty Advisor: Dr. Anita Blanchard

Department: Psychological Sciences

This study examines the relationships between employee similarities, perceived entitativity, and the organizational outcome of satisfaction. Entitativity is defined as a feeling of “groupy-ness” for social units (Blanchard, 2018; Campbell, 1958; Lickel et al, 2000). Previous research suggests a positive relationship between similarity and perceived entitativity (Campbell, 1958; Lickel et al. 2000). How, then, will employee work group diversity--which suggests less similarity--be related to entitativity? I suggest that there are two forms of similarity: similarity of attitudes and similarity of goals. The similarity of characteristics is sometimes called homogeneity or surface level similarity. Surface level diversity may not be as important as deep level similarity in workgroups (Robbins, S. P., & Judge, T. A. (2018). I hypothesize a positive relationship between similarity of attitudes and perceived entitativity and a positive relationship between the similarity of goals and entitativity in workgroups. Furthermore, I hypothesize there will be a positive relationship between entitativity and satisfaction. Participants will complete measures of similarity, perceived entitativity, and satisfaction through an online survey. Responses will be analyzed through a linear regression analysis. The results of my hypotheses should help managers understand that similarity in work goals and attitudes is more important than demographic similarity. This may help reduce discrimination at work by managers who think the demographic similarity is important to work group success. Similarities of employees’ goals should be considered when encouraging group processes and positive group atmospheres in the workplace.

Abstract #883; Social Sciences

Title: Investigating and Comparing Aspects of Sustainable Development Goal 5

Student Author(s): JD Dawson and Carolina Campos **G**

Faculty Advisor: Dr. Erik Byker

Department: Reading and Elementary Education

The purpose of our research poster is to investigate and compare aspects of the Sustainable Development Goal (SDG) 5 - Gender Equality. In particular, we examined the following aspects of SDG 5: religious influence on gender equality in Saudi Arabia and the social rights of transgender individuals in China. The main research question for our comparative study is: What are the similarities and differences among G20 countries related to the aspects of our Sustainable Development Goal? For this research presentation, we focus on comparisons among the United States, Saudi Arabia, and China. To conduct this research, we used a literature review research design methodology. We searched for resources on the Atkins Library databases using keywords like gender inequality, gender equity, and human rights. Our data is comprised of three country reports, one journal articles, and thirteen other reliable sources. The findings of our research include a discussion of the challenges and possibilities in meeting SDG 5 - Gender Equality.

CE - Community Engaged
NC - North Carolina

G - Global
S - Sustainability

H - Honors
U - Charlotte

Abstract #884; Social Sciences

Title: Investigating and Comparing Aspects of Sustainable Development Goal #15

Student Author(s): Ivaned De Leon, Marco Busselli, and Luke Rikard **G**

Faculty Advisor: Dr. Erik Byker

Department: Reading and Elementary Education

The purpose of our research poster is to investigate and compare aspects of the Sustainable Development Goal (SDG) #15 Life on Land. In particular, we examined the following aspects of SDG #15: Air pollution in China. The main research question for our comparative study is: What are the similarities and differences among G20 countries related to the aspects of our Sustainable Development Goal? For this research presentation, we focus on comparisons among the United States and China. To conduct this research, we used a literature review research design methodology. We searched for resources on the Atkins Library databases using keywords like air pollution, China, causes, health. Our data is comprised of 2 country reports, one journal articles, and five other reliable sources. The findings of our research include a discussion of the challenges and possibilities in meeting SDG #15 Life on Land.

CE-Community Engaged
NC-North Carolina

G-Global
S-Sustainability

H-Honors
U-Charlotte

Abstract #885; Social Sciences

Title: Land Degradation and Policy Implications in Morocco

Student Author(s): Allison Doyle, Breanna Sorrell, and Danielle Lucido **G, H, S**

Faculty Advisor: Dr. Vaughn Schmutz

Department: Sociology

Land degradation has become a major issue in many African countries including Morocco. More specifically, Morocco's land has degraded due to salinization, drought, desertification, and soil erosion. This has led to many instances of land abandonment and threatens issues with food production. We will be focusing on both the causes and effects of land degradation as well as the policy implications associated with those effects. In order to examine this, we will be using sources from a Moroccan government initiative as well as peer-reviewed scientific studies from various universities.

CE-Community Engaged
NC-North Carolina

G-Global
S-Sustainability

H-Honors
U-Charlotte

Abstract #886; Social Sciences

Title: Investigating and Comparing Aspects of Sustainable Development Goal #16

Student Author(s): Daniel Engman, Erin Gibson, and Matek Wiggins **G**

Faculty Advisor: Dr. Erik Byker

Department: Reading and Elementary Education

The purpose of our research poster is to investigate and compare aspects of the Sustainable Development Goal (SDG) # 16: Peace, Justice, and Strong Institutions. In particular, we examined the following aspects of SDG # 16: Gun Violence, Terrorism, and Organized Crime. The main research question for our comparative study is: What are the similarities and differences among G20 countries related to the aspects of our Sustainable Development Goal? For this research presentation, we focus on comparisons among the United States, Brazil, Germany, and France. To conduct this research, we used a literature review research design methodology. We searched for resources on the Atkins Library databases using keywords like “gun violence,” “terrorism” and “organized crime.” Our data is comprised of three country reports, 11 journal articles, and two other reliable sources. The findings of our research include a discussion of the challenges and possibilities in meeting SDG 16: Peace, Justice, and Strong Institutions.

CE-Community Engaged
NC-North Carolina

G-Global
S-Sustainability

H-Honors
U-Charlotte

Abstract #887; Social Sciences

Title: Investigating and Comparing Aspects of Sustainable Development Goal #16: Peace, Justice and Strong Institutions

Student Author(s): Justin Finn, Sara Lawless, and Imani Gill **G**

Faculty Advisor: Dr. Erik Byker

Department: Reading and Elementary Education

The purpose of our research poster is to investigate and compare aspects of the Sustainable Development Goal (SDG) # 16 Peace, justice, and strong institutions. In particular, we examined the following aspects of SDG # 16: Violence in Brazil, Police Brutality in India, and Sexual Violence in Mexico. The main research question for our comparative study is: What are the similarities and differences among G20 countries related to the aspects of our Sustainable Development Goal? For this research presentation, we focus on comparisons among the United States, Brazil, India, and Mexico. To conduct this research, we used a literature review research design methodology. We searched for resources on the Atkins Library databases using keywords like violence, brutality, and sexual abuse. Our data is comprised of three country reports, 11 journal articles, and eight other reliable sources. The findings of our research include a discussion of the challenges and possibilities in meeting SDG 16 Peace, justice and strong institutions.

CE - Community Engaged
NC - North Carolina

G - Global
S - Sustainability

H - Honors
U - Charlotte

Abstract #888; Social Sciences

Title: Investigating and Comparing Aspects of Sustainable Development Goal #6

Student Author(s): Riley Forbes and Lia Harris **G**

Faculty Advisor: Dr. Erik Byker

Department: Reading and Elementary Education

The purpose of our research poster is to investigate and compare aspects of the Sustainable Development Goal #6: Clean water and sanitation. In particular, we examined the following aspects of SDG #6: Clean water and sanitation: Water Conservation in Saudi Arabia and Water Crisis in South Africa. The main research question for our comparative study is: What are the similarities and differences among G20 countries related to the aspects of our Sustainable Development Goal? For this research presentation, we focus on comparisons among the United States, Saudi Arabia, and South Africa. To conduct this research, we used a literature review research design methodology. We searched for resources on the Atkins Library databases using keywords like water conservation, water crisis, day zero, and water scarcity). Our data is comprised of two country reports, three journal articles, and two other reliable sources. The findings of our research include a discussion of the challenges and possibilities in meeting SDG #6: Clean water and sanitation.

CE - Community Engaged
NC - North Carolina

G - Global
S - Sustainability

H - Honors
U - Charlotte

Abstract #889; Social Sciences

Title: Iceland's Response to Climate Change

Student Author(s): Sophia Gucciardi and Mara Stumpf Richard Vaca **G, H, S**

Faculty Advisor: Dr. Vaughn Schmutz

Department: Sociology

As climate change becomes more of a concern around the world, Iceland is taking an active role in fighting back. The country has engineered and implemented green technologies and regulations to reduce their impact on the environment and protect itself from climate change. In this project, we are examining the various ways in which Iceland has responded to climate change. We are going to look at how Iceland has responded to climate change through governmental policy, NGOs and the Icelandic population.

CE-Community Engaged
NC-North Carolina

G-Global
S-Sustainability

H-Honors
U-Charlotte

Abstract #890; Social Sciences

Title: Perceptions Regarding Consumption of Animal Products and Correlation with Behavior amongst NC Undergraduate Students

Student Author(s): Madison Harris **H, NC S**

Faculty Advisor: Dr. Vaughn Schmutz

Department: Sociology

BACKGROUND: Over the past 75 years, the vegan diet has been adopted by a variety of people differing in age, gender, race, socioeconomic status, etc. According to a recent study, stretching across the US and UK, up to 52% of vegans fall within the age range of 16-24. While the vegan diet can be applicable and beneficial for people of all ages, the diet is most commonly adopted by a younger demographic.

OBJECTIVE: The goal of this study is to provide insight regarding the perceptions of veganism among undergraduate students in North Carolina between the ages of 18 and 24. Furthermore, this study encompasses the assumptions made by the target population concerning health benefits, health risks, ethical beliefs, and stereotypes associated with a vegan diet.

METHODS: To gather my data, I will distribute an online survey across North Carolina undergraduate students. This survey will address environmental attitudes, attitudes toward vegan/vegetarian diets, attitudes regarding meat consumption, ideas about health/nutritional misconception, and dietary behaviors of the participants.

CONCLUSION: From the data, I will conclude how the perceptions of individuals regarding animal product consumption correlate with their choices and behaviors.

CE - Community Engaged
NC - North Carolina

G - Global
S - Sustainability

H - Honors
U - Charlotte

Abstract #891; Social Sciences

Title: The Economic Impacts and Effects of the Housing First Initiative on Arrest Rates in the Charlotte Mecklenburg Area

Student Author(s): Lena Ilagan **CE, H, NC, U**

Faculty Advisor: Dr. Justin Lane

Department: Urban Research Institute

This study seeks to examine the effect of the Housing First Charlotte Mecklenburg program on arrest and incarceration rates in the homeless population as well as its economic impact in turn. Data were collected on 340 chronically homeless individuals in the Charlotte-Mecklenburg concerning their arrest and incarceration history from June 1, 2015, to December 31, 2018. This study seeks to assess how changes in arrest and incarceration rates specifically impact the Charlotte Mecklenburg community both socially and economically. Any decrease in arrests and incarceration point to beneficial economic effects on the Charlotte Mecklenburg community as the city as criminal justice involvement is costly to taxpayers. The findings of this study sought to shed light on the outcomes associated with the Housing First initiative and provide policy-makers a better picture of the program's benefits.

CE - Community Engaged
NC - North Carolina

G - Global
S - Sustainability

H - Honors
U - Charlotte

Abstract #892; Social Sciences

Title: A Goal-Oriented Approach to Finding the Source of Meaning in Life

Student Author(s): Seena Koohestani **H**

Faculty Advisor: Dr. Amy Canevello

Department: Psychological Sciences

People who feel that their lives are meaningful also experience healthy psychological functioning, but less is known about what contributes to meaning in life. Most literature on meaning assumes that meaning is derived from what people do, yet this literature largely ignores the potential role of motives. This study takes a goal-oriented approach to meaning through the lens of interpersonal motivation orientations; specifically, compassionate goals to support others and not harm them and self-image goals to construct, maintain, and defend desired images of the self. We hypothesized that compassionate goals predict greater meaning in life through support given to others, whereas self-image goals predict greater meaning in life through support received from others. We are currently conducting a study in which undergraduates' complete measures of compassionate and self-image goals, social support given and received, and meaning in life. Preliminary analyses (N = 155) do not support our hypothesized model but instead support a model in which compassionate goals lead to greater support given, which leads to greater support received, which in turn predicts greater meaning in life. These data provide preliminary evidence that the reasons why people engage in behavior, specifically their interpersonal orientations, may contribute to meaning in life.

CE - Community Engaged
NC - North Carolina

G - Global
S - Sustainability

H - Honors
U - Charlotte

Abstract #893, Social Sciences

Title: Sorority Involvement and Depressive Symptoms

Student Author(s): Aurora Krec **NC, U**

Faculty Advisor: Dr. Hannah Peach

Department: Psychology

Depression is a medical illness that negatively affects the way one processes information and behaves. The present study hypothesizes that college women involved in sororities will have worse depressive symptoms than women that both used to be and have never been in a sorority. For the study, the researcher surveyed English-speaking college females between the ages of 18 to 26 (N=86, 89.5% White, 44 = in a sorority, 39 = never in a sorority). The survey consisted of 18 questions about demographics, sorority involvement, and depressive symptoms. The total score for depression was 60, and the mean was 43.71. The results showed that there was no significant difference between depressive symptoms of sorority women and non-sorority women, although the difference between ex-sorority women and the others independently was nearing significant. The lack of significant results was most likely due to the small number of participants in the ex-sorority group (N=3). Though the present study did not provide significant results, it does provide a background for future studies to build upon and sheds light on the possible association between mental health and sorority status.

Abstract #894; Social Sciences

Title: Closing the Gap between College Students' Professional Attire Needs and Career Readiness

Student Author(s): Jenna Lane, Ashley Rankin, and Conner Clarken **CE, NC, U**

Faculty Advisor: Dr. Kim Buch

Department: Psychology

With the rising cost of college, many students face a range of economic challenges, including the professional attire required for job and internship interviews. In response to this problem, the University of North Carolina at Charlotte offers a career-readiness program that allows students to “shop” for free professional clothing at its on-campus Food Pantry. The program is called Attire for Hire (AFH), and the purpose of this study was to examine its impact on participants in need of professional interview clothing. Participants were asked to complete a survey regarding their satisfaction, confidence, and knowledge of career development after the implementation of the AFH event. Based on preliminary findings, all participants reported having acquired career branding skills, professional skills and at least one item of interview-ready clothing. Due to the lack of existing literature, the findings presented in this study provide introductory support for the value of on-campus programs like AFH. More research is needed on this topic as colleges and universities consider innovative ways to prepare all students for the successful transition into the workplace.

CE - Community Engaged
NC - North Carolina

G - Global
S - Sustainability

H - Honors
U - Charlotte

Abstract #895; Social Sciences

Title: Effect of Type of Color on One's Perception of Cartoon Characters

Student Author(s): Wing Yin Lee

Faculty Advisor: Dr. Cara Blevins

Department: Psychological Science

This study investigated the effect of type of colors (warm or cold) on one's perception. Color vision is one's subjective perception of visible light. However, it is unclear how colors affect one's perceptions of different objects. Few studies were done on the topic of color perception since more were inquired into how color assist the human visual search. For instance, one study was purposed to find the best four-color combination for 2-D maps. Another research was conducted to examine the most effective color for road signs. For this study, participants were given an online survey with pictures of cartoon characters and asked to rate the likelihood of each character being a hero/ heroine in an animated movie. The experimental characters had the same facial features, except one was in warm colors (red, orange, yellow, etc.) and the other was in cold colors (green, purple, blue, etc.). Distractors with mixed color were placed in between the experimental characters. Two independent t-tests were used to analyze the data. The result showed that colors significantly affect one's perception of the characters. The result also suggested that people tend to associate warm colors with positivity, and cold colors with negativity.

Abstract #896; Social Sciences

Title: Investigating and Comparing Aspects of Sustainable Development Goal 1

Student Author(s): Mackenzie Lee and Siraj Sabha **G**

Faculty Advisor: Dr. Erik Byker

Department: Reading and Elementary Education

The purpose of our research poster is to investigate and compare aspects of the Sustainable Development Goal (SDG) #1 No Poverty. In particular, we examined the following aspects of SDG #1: Malnourishment, hunger, and inflation. The main research question for our comparative study is: What are the similarities and differences among G20 countries related to the aspects of our Sustainable Development Goal? For this research presentation, we focus on comparisons among the United States, South Africa, and Egypt. To conduct this research, we used a literature review research design methodology. We searched for resources on the Atkins Library databases using keywords like malnutrition, hunger, and poverty. Our data is comprised of three country reports, three journal articles, and eight other reliable sources. The findings of our research include a discussion of the challenges and possibilities in meeting SDG 1: No Poverty.

CE-Community Engaged
NC-North Carolina

G-Global
S-Sustainability

H-Honors
U-Charlotte

Abstract #897; Social Sciences

Title: You Being New is Hard on Me Too

Student Author(s): Stephanie Leonard, Alex Dunn, Allison Toth, Kathryn Kavanagh,
and Amanda Sargent

Faculty Advisor: Dr. Linda Shanock

Department: Psychological Science

The literature on occupational socialization focuses on newcomer adjustment during the onboarding process, but few studies have examined outcomes of demands placed on trainers as a socialization agent. This study explores the trainer's perspective during new employee onboarding. According to the job demands-resources model, employees with high psychological demands (e.g., onboarding a newcomer) and low resources (e.g., poor assimilation) experience negative well-being. The current study contributes to the socialization literature by examining relationships between a trainer's increased job demands when socializing newcomers and degree of trainer assimilation in their organization. Outcomes include trainer emotional exhaustion, intent to quit, and perceived newcomer task performance. We surveyed 116 workplace trainers to measure their job demands, assimilation, intent to quit, emotional exhaustion, and newcomer performance. Using multiple regression analysis, we found trainer assimilation had a significant positive relationship with newcomer task performance and a significant negative relationship with trainer emotional exhaustion and intent to quit. Trainer job demands during the onboarding process had a significant positive relationship with emotional exhaustion only. Results suggest assimilation is more important in predicting trainer outcomes and newcomer performance than the additional job demands required during onboarding.

Abstract #898; Social Sciences

Title: Permanent Supportive Housing Contract

Student Author(s): Taelor Malcolm **CE, H, U**

Faculty Advisor: Dr. Jenny Hutchinson

Department: Public Health

The Housing First approach aims to give those living on streets or in shelters access to permanent supportive housing (PSH) that does not have the same preconditions - such as sobriety, treatment compliance, or a clean criminal record - as other homeless housing options. Research suggests that housing first PSH leads to less emergency health care and criminal justice utilization, but limited research examines the more specific costs of providing PSH. This research focused on assessing the costs of PSH in Mecklenburg County and comparing the average cost of these programs to others around the country. A review of relevant literature, conducting interviews with agencies that provide PSH in Mecklenburg County, and analyzing the financial records of programs in the area allowed for completion of cost analysis and comparison. Results of the study and the key factors related to the cost of PSH in Mecklenburg County will be detailed on this poster.

CE - Community Engaged
NC - North Carolina

G - Global
S - Sustainability

H - Honors
U - Charlotte

Abstract #899; Social Sciences

Title: Does Pepe Make You Racist? Investigating the Effects of Irony Poisoning on Racist Attitudes

Student Author(s): Nikolai Mather **H**

Faculty Advisor: Dr. Frederico Batista

Department: Political Science

Memes have become a primary means of communication on the Internet. Members of the alt-right's often attempt to propagate their views by creating racist memes. Sometimes, users who are not ostensibly far-right will repost these racist memes, claiming to do so "ironically" (i.e., without racist intent). But long-term exposure to certain ideas may influence opinions on those ideas, whether it was initially sincere or not. This paper explores the concept of irony poisoning and seeks to establish a causal link between "ironic" racist memes and racist attitudes. In this survey experiment, subjects first respond to a series of social desirability questions about expressing controversial beliefs. They are then randomly assigned to view one of three groups of memes (humorously ironic and non-racist, non-humorously ironic and racist, or humorously ironic and racist) and are instructed to rate them. Finally, they are subjected to questions about symbolic racism. We hypothesize that those shown humorously ironic racist memes will display higher levels of racial prejudice because the ironic tone should alleviate concerns about social desirability. While results will not be obtained and analyzed until after the conference, this research paper lays out the literature and theory behind these expectations.

Abstract #900; Social Sciences

Title: Investigating and Comparing Aspects of Sustainable Development Goal #16: Peace, Justice and Strong Institutions

Student Author(s): Austin Melakayil and Cemere Petty **G**

Faculty Advisor: Dr. Erik Byker

Department: Reading and Elementary Education

The purpose of our research poster is to investigate and compare aspects of the Sustainable Development Goal (SDG) # 16 peace, justice, strong institutions. In particular, we examined the following aspects of SDG # 16: Unemployment after prison, incarceration rates, and prison conditions. The main research question for our comparative study is: What are the similarities and differences among G20 countries related to the aspects of our Sustainable Development Goal? For this research presentation, we focus on comparisons among the United States, Canada, and Norway. To conduct this research, we used a literature review research design methodology. We searched for resources on the Atkins Library databases using keywords like incarceration, prison, unemployment. Our data is comprised of three country reports, four journal articles, and four other reliable sources. The findings of our research include a discussion of the challenges and possibilities in meeting SDG 16 Peace, justice, and Strong institutions.

CE-Community Engaged
NC-North Carolina

G-Global
S-Sustainability

H-Honors
U-Charlotte

Abstract #901; Social Sciences

Title: Investigating and Comparing Aspects of Sustainable Development Goal 8

Student Author(s): Drew Pescaro, Khara Moise, and Kamryn Vincent **G**

Faculty Advisor: Dr. Erik Byker

Department: Reading and Elementary Education

The purpose of our research poster is to investigate and compare aspects of the Sustainable Development Goal (SDG) #8 - Decent Work / Economic Growth. In particular, we examined the following aspects of SDG #8 Decent Work and Economic Growth: Asylum Rights/Immigration Reform in Italy, Haitian Immigration in Canada. The main research question for our comparative study is: What are the similarities and differences among G20 countries related to the aspects of our Sustainable Development Goal? For this research presentation, we focus on comparisons among the United States, Italy, and Canada. To conduct this research, we used a literature review research design methodology. We searched for resources on the Atkins Library databases using keywords like immigration, asylum rights, Canada, Italy, policies. Our data is comprised of two country reports, 0 journal articles, and five other reliable sources. The findings of our research include a discussion of the challenges and possibilities in meeting SDG #8 - Decent Work / Economic Growth.

CE-Community Engaged
NC-North Carolina

G-Global
S-Sustainability

H-Honors
U-Charlotte

Abstract #902; Social Sciences

Title: How Yoga and Meditation Positively Affect Stress Levels in College Students

Student Author(s): Delanie Postma

Faculty Advisor: Dr. Hannah Peach

Department: Psychological Sciences

For most, college is one of the most stressful times in an individual's life, adjusting to new people and a new environment. There is ample evidence to support an association between lowering stress levels by performing yoga and practicing meditation in many age groups from young adults to old. Since these are still somewhat new practices, little research has been conducted on the relationship between these variables specifically in college students. The present study attempted to assist in reducing this disparity and predicted yoga and meditation would lower stress levels or common stressors in college students. The sample included undergraduate students (N=139) from the University of North Carolina at Charlotte who were between the ages of 18 and 22 (M=19.12). Participants completed a survey through an online research system, SONA, in which they reported the times per week they felt stressed and how many times per week they performed yoga and meditation. They were also prompted to respond to a short answer question asking them what different stressors were present in their life. (i.e., grades, jobs, and relationships) Then the participants were asked a series of questions from three different surveys, the Outcome Expectations for Yoga Scale (OEY), Perceived Stress Scale (PSS), and the Feeling Consciousness Scale (FCS). The experimental hypotheses were rejected as the results did not indicate a significant correlation between performing yoga and meditation and reduction of stressors. Although these findings did not support the hypotheses, the results can be used to guide future research and have the potential to broaden further the idea of performing yoga and meditation.

Abstract #903; Social Sciences

Title: Closing the Gap between College Students' Professional Attire Needs and Career Readiness

Student Author(s): Ashley Rankin, Conner Clarken, and Jenna Lane **CE, NC, U**

Faculty Advisor: Dr. Kim Buch

Department: Psychology

With the rising cost of college, many students face a range of economic challenges, including the professional attire required for job and internship interviews. In response to this problem, the University of North Carolina at Charlotte offers a career-readiness program that allows students to “shop” for free professional clothing at its on-campus Food Pantry. The program is called Attire for Hire (AFH), and the purpose of this study was to examine its impact on participants in need of professional interview clothing. Participants were asked to complete a survey regarding their satisfaction, confidence, and knowledge of career development after the implementation of the AFH event. Based on preliminary findings, all participants reported having acquired career branding skills, professionalism skills and at least one item of interview-ready clothing. Due to the lack of existing literature, the findings presented in this study provide introductory support for the value of on-campus programs like AFH. More research is needed on this topic as colleges and universities consider innovative ways to prepare all students for the successful transition into the workplace.

CE - Community Engaged
NC - North Carolina

G - Global
S - Sustainability

H - Honors
U - Charlotte

Abstract #904; Social Sciences

Title: Racial Disparity: The Impact of Race on State Incarceration Rates

Student Author(s): Autumn Robertson **NC, U**

Faculty Advisor: Dr. Carol Stivender

Department: Economics

A comprehensive research paper on the effect of race (as a percent of state population that are people of color) on state incarceration rates. This research considers other variables such as median state income, state education rates, gender (as a percent of the state population that is male), state unemployment rates, and other possible factors. Research shows a correlation between an increase in the percent of state populations that are people of color and an increase in state incarceration rates.

CE-Community Engaged
NC-North Carolina

G-Global
S-Sustainability

H-Honors
U-Charlotte

Abstract #905; Social Sciences

Title: Impact of Climate Change on Brazil

Student Author(s): Lindsey Sanders, Hebatallah Ibrahim, Corey Fields **G, H, S**

Faculty Advisor: Dr. Vaughn Schmutz

Department: Sociology

Brazil is one of the major food-production countries, and climate change is not only having a negative impact on the environment, but it is also harming the Brazilian economy in a major way. Throughout our presentation, our focus will be on how the Brazilian government is responding and taking action to stop the impacts of global warming. We will be reviewing what the Brazilian government is doing to combat the impacts of climate change on their coastal, forest, and agricultural ecosystems, and even what they can do more. We will be researching and examining the arguments and databases of the Brazilian government, including the arguments from the Brazilian environmental minister and how he sees climate change as a secondary issue. We will also examine the Brazilian government's official statements and policies in order to find out what are they doing to minimize the damages caused by climate change.

Abstract #906; Social Sciences

Title: Anthropology in Action: Summer Programming for At-Risk Youth in West Charlotte

Student Author(s): Kim Savage **CE, U**

Faculty Advisor: Dr. Catherine Fuentes

Department: Anthropology

"In the summer of 2018, I had the privilege to serve the Renaissance West Community as a Community Engagement Intern. I spent my time working hands-on with the youth and executive staff at the Renaissance West Community Initiative. After realizing that there were gaps in summer programming, I spearheaded special projects to supply swim diapers and obtain target gift cards to use for current and future community programming needs. When I was not working on this project, I was assisting executive staff by helping them prepare for community programming events they planned. I completed this internship for credit towards my Applied Anthropology major, and at the time I did not realize it would teach me valuable ethnography skills. In my research, I plan to discuss the intended result and the actual results of internship and the opportunities I provided to the community I served, what influences resulted in the outcomes I experienced, the amazing ethnographic method skills I learned first hand, and how my experience compared to a study completed by the University of South Florida entitled Engaging Ethnography: Student Engagement as a Mean for Creating Change, which also examines summer youth programming by anthropology interns completed in 2007. "

CE - Community Engaged
NC - North Carolina

G - Global
S - Sustainability

H - Honors
U - Charlotte

Abstract #907; Social Sciences

Title: つなみはわるいですよ - Fighting against the Inevitable (Tsunamis in Japan)

Student Author(s): Sydney Scott, Hope Callahan, and Courtney Fuller **G, S**

Faculty Advisor: Dr. Vaughn Schmutz

Department: Sociology

Japan has a history of tsunamis that have devastated the island country for centuries. Throughout the years, there have been numerous studies conducted to determine preventative solutions. However, the solutions implemented are not effective because they do not cover all the areas devastated by tsunamis due to the unpredictability of natural disasters. Tsunamis also create an enormous amount of pollution after the waves hit when the waves recede. This natural disaster not only destroys lives, homes, businesses, and other pieces of civilization, it also pulls the debris into the ocean where it can harm marine life. We plan to research the most effective preventative measures that can be implemented to prevent mass destruction and ocean pollution due to tsunamis.

Abstract #908; Social Sciences

Title: Investigating and Comparing Aspects of Sustainable Development Goal #3

Student Author(s): Katherine Stroud, Savannah Ball, and Ryan Murphy **G**

Faculty Advisor: Dr. Erik Byker

Department: Reading and Elementary Education

The purpose of our research poster is to investigate and compare aspects of the Sustainable Development Goal (SDG) #3: Good Health and Well-Being. In particular, we examined the following aspects of SDG #3: drugs and alcohol, focusing overall on substance abuse. The main research question for our comparative study is: What are the similarities and differences among G20 countries related to the aspects of our Sustainable Development Goal? For this research presentation, we focus on comparisons among the United States, Australia, India, and Afghanistan. To conduct this research, we used a literature review research design methodology. We searched for resources on the Atkins Library databases using keywords like, "drugs," "alcohol," and "mental illness." Our data is comprised of five country reports, four journal articles, and eleven other reliable sources. The findings of our research include a discussion of the challenges and possibilities in meeting SDG #3: Good Health and Well-Being.

CE - Community Engaged
NC - North Carolina

G - Global
S - Sustainability

H - Honors
U - Charlotte

Abstract #909; Social Sciences

Title: Investigating and Comparing Aspects of Sustainable Development Goal 6

Student Author(s): Joshua Vazquez and William Huntley **G**

Faculty Advisor: Dr. Erik Byker

Department: Reading and Elementary Education

The purpose of our research poster is to investigate and compare aspects of the Sustainable Development Goal (SDG) # 6 Clean Water and Sanitation. In particular, we examined the following aspects of SDG # 6: Water Safety and Pollution. The main research question for our comparative study is: What are the similarities and differences among G20 countries related to the aspects of our Sustainable Development Goal? For this research presentation, we focus on comparisons among the United States, Turkey, and India. To conduct this research, we used a literature review research design methodology. We searched for resources on the Atkins Library databases using keywords like water, pollution, safety, and sanitation. Our data is comprised of four country reports, three journal articles, and three other reliable sources. The findings of our research include a discussion of the challenges and possibilities in meeting SDG # 6 Clean Water and Sanitation.

CE-Community Engaged
NC-North Carolina

G-Global
S-Sustainability

H-Honors
U-Charlotte

Abstract #910; Social Sciences

Title: Investigating and Comparing the Sustainable Development Goal #8

Student Author(s): Brandon Wagner and Ryan Barber **G**

Faculty Advisor: Dr. Erik Byker

Department: Reading and Elementary Education

The purpose of our research poster is to investigate and compare aspects of the Sustainable Development Goal (SDG) #8 decent work and Economic growth. In particular, we examined the following aspects of SDG #8: Unemployment in “G22” countries. The main research question for our comparative study is: What are the similarities and differences among G20 countries related to the aspects of our Sustainable Development Goal? For this research presentation, we focus on comparisons among the United States, Egypt, and Germany. To conduct this research, we used a literature review research design methodology. We searched for resources on the Atkins Library databases using keywords like Unemployment; Our data is comprised of 2 country reports, three journal articles, and seven other reliable sources. The findings of our research include a discussion of the challenges and possibilities in meeting SDG 8: Decent Work and Economic Growth.

CE-Community Engaged
NC-North Carolina

G-Global
S-Sustainability

H-Honors
U-Charlotte

Abstract #911; Social Sciences

Title: Investigating and Comparing Global Climate Change & Sustainability in Denmark and Brazil

Author(s): Abdul Yates and Zach Otto **G**

Faculty Advisor: Dr. Erik Byker

Department: Reading and Elementary Education

The purpose of our research poster is to investigate and compare aspects of the Sustainable Development Goal (SDG) #13/ Climate Change. In particular, we examined the following aspects of SDG # 13: Global Climate Change Policy. The main research question for our comparative study is: What are the similarities and differences among G20 countries related to the aspects of our Sustainable Development Goal? For this research presentation, we focus on comparisons among the United States, Denmark, and Brazil). To conduct this research, we used a literature review research design methodology. We searched for resources on the Atkins Library databases using keywords like (global climate change, policies, Denmark, and Brazil). Our data is comprised of 3 country reports, six journal articles, and one other reliable sources. The findings of our research include a discussion of the challenges and possibilities in meeting SDG 13, climate sustainability.

Abstract #912; Social Sciences

Title: Decision-Making and Cognitive Biases in Virtual Reality

Student Author(s): Margaret Reichard

Faculty Advisor: Dr. Issac Cho

Department: Computer Science

Cognitive biases greatly affect human decision-making in the real world. However, very little research has attempted to address how cognitive biases affect decision-making in immersive virtual reality environments. This research focuses on one well-known cognitive bias, the fundamental attribution error, to explore how it influences interactions between a virtual human and a human in a head-mounted VR display system. We have conducted a series of formal user studies to evaluate how a participant infers the personal attitude of the virtual human based on gender and race. Participants are asked to do attitude attribution tasks (essay and silent interview) with controversial topics e.g. capital punishment, genetically modified foods) in a virtual environment. In addition, we are conducting an online study with Amazon Mechanical Turk in order to replicate the original fundamental attribution error study. For this iteration, each participant views a text description, human stock photo, or virtual image of the author of an essay on a controversial topic. The results of the online study will be compared with the VR one, in order to better understand how the effects of cognitive biases in online and virtual realms differ from those in human environments.

Abstract #913; Social Sciences

Title: Studying the Relationship between Transit systems and Economic Segregation in Three Major MSA

Student Author(s): Vani Singh, Todd Doane, and Luis Martinez **U**

Faculty Advisor: Dr. Isabelle Nilsson

Department: Geography and Earth Sciences

This project examines geographic patterns of income segregation in relation to the opening of transit systems. We analyzed the spatial distribution of income classes across the Metropolitan Statistical Areas of Washington DC, Minneapolis, and St. Louis, using decennial median household income data at the census tract level and coordinate data for transit stations opened between 1970 to 2010. We conducted hot-spot (Getis-Ord G_i^*) analysis of each MSA for each decennial census year and compared them with opening dates of each station. Through the hotspot analysis, we are able to visualize and quantify the changes in income segregation through time. Our results demonstrate similar patterns of economic segregation in each MSAs. In general, patterns did not change much. However, after the opening of stations, some neighborhoods saw higher-income residents moving away from station neighborhoods, creating areas lower-income. Therefore, the new stations seem to be a factor in the change. However, it is important to note that spatial correlation does not necessarily imply causation, and that other factors may be playing a role in causing the change.

CE - Community Engaged
NC - North Carolina

G - Global
S - Sustainability

H - Honors
U - Charlotte

