

2023

2023 Annual Undergraduate Research Conference Program

USF Office of High Impact Practices and Undergraduate Studies

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2023 ANNUAL UNDERGRADUATE RESEARCH CONFERENCE



UNIVERSITY of
SOUTH FLORIDA

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ACKNOWLEDGMENTS

The Undergraduate Research Conference Organizing Committee would like to acknowledge the contributions and scholarship of USF faculty and instructors who are committed to mentoring undergraduate students. Because of you, those students are transformed into scholars! Thanks to colleagues in Undergraduate Studies, USF Libraries, and across USF who have supported us in making this conference a successful event.

A very special thanks to the OneUSF Undergraduate Research Conference Platinum Sponsors and our valued partners:

Elizabeth Nelson, MBA Program Director, Florida High Tech Corridor, University of South Florida
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Sylvia Wilson Thomas, Ph.D. Interim Vice President for Research & Innovation



Dear USF Students, Colleagues, and Guests,

What an exciting time for undergraduate research at the University of South Florida! We are thrilled to host over 200 research presentations, including our first time featuring creative performance at the Tampa Showcase. As part of our USF Strategic Plan, undergraduate research events like these are integral to our institutional mission and fuel the success of our students. Whether you are visiting one of the three in-person showcases or enjoying exhibits online at the OneUSF Virtual conference, I know you will be impressed with the inquiry, critical thinking, and communication skills demonstrated by our students. GO BULLS!



Allison H. Crume, Ph.D.
Dean of Undergraduate Studies



Dear Students and Colleagues,

On behalf of the University of South Florida, I welcome you to USF's annual Undergraduate Research Conference. Our student researchers are central to our work to build a better tomorrow. This conference promotes and showcases educational opportunities that help students build the skills they need to succeed in the workplace and as engaged global citizens.

I am impressed by our students and faculty mentors, who have a passion for high-level scholarship and a commitment to collaboration and discovery. Congratulations to our student presenters, their teams, and our faculty mentors. Your collaboration and guidance are a testament to the USF mission – providing access to student success and an unwavering pursuit of excellence for the betterment of our students, research, and the communities we serve.

I also offer my thanks to the Office of High Impact Practices and Undergraduate Research for organizing and facilitating this meaningful opportunity for students to present their research projects and to the faculty and staff volunteers moderating these sessions. Your service contributes to the university's accomplishments related to research and scholarship, to which students are essential contributors, focusing on addressing pervasive problems and generating and disseminating knowledge.

Thank you to our students and faculty for bringing out the best our university has to offer.



Dr. Prasant Mohapatra
Provost and Executive Vice President

Access all conference materials online here:
https://digitalcommons.usf.edu/usf_ourconference/2023/

Maternal Disparities Regarding Physician Visitation Rates during Pregnancy

Wid Alhassani, Hanan Ibrahim, Jhanavi Sabharwal

Faculty Mentor: Irene Hurst (Muma College of Business)

Carepath is defined as personalized and comprehensive support for patients and their families for their healthcare needs. Its main goal is to optimize resource usage by integrating the different facets of healthcare to ensure the best care. Carepath can be applied to maternal health to reduce disparities. Maternal healthcare disparities exist for women in low socioeconomic conditions. There is a lack of healthcare equity and that is reflected in the amount of physician visitations during pregnancy. The low physician visitation rates may contribute to the higher mortality rates in poor and underserved communities. Even in countries where there is universal healthcare coverage, the highest rates of inadequate prenatal visitations were in areas in inner cities which are characterized by lower incomes than suburban areas. There are a variety of factors that contribute to lower physician visits in lower socioeconomic conditions. This includes lack of transportation to the clinic, physician neglect and burnout, lack of education or compliance by the patient, expensive healthcare costs, and lack of insurance coverage. Since maternal disparities are a multifaceted problem AI machine learning can provide women with personalized healthcare that considers their unique personal factors when deciding which plan of care best supports them and their unique situation. It can optimize available resources and increase physician visitation rates which could lead to decreased maternal mortality.

Beyond the Bedside: Navigating Concerns Within a Nursing Department

Mary Carmen Cayangho Andruskiewicz, Reena Maria Howard, Maysee Huynh, Bryant Anthony Yau, Nicole Nagib, Kelly Nicole Drago

Faculty Mentor: Donna Lee Ettl-Gambino (Judy Genshaft Honors College)

Hospital nursing departments are paramount to the organization's ability to deliver quality patient care. Employee burnout and retention continue to be an ongoing challenge. The manner in which nursing leadership addresses nurse team members' concerns often falls short of staff expectations. The clinical environment has the potential to enhance staff performance, job satisfaction, and quality of care. The purpose of this study was to better understand concerns expressed by nursing department employees within a multi-hospital system in the Midwestern United States.

A MANOVA was conducted to examine significant trends across groups. The independent variable was the nurse employee role. The dependent variables were the following categorized concerns: 1) compensation and benefits; 2) staffing; 3) workplace conflicts; 4) policies and procedures; 5) management and 6) performance. One criterion was found to be statistically significant: 1) Overall, nursing staff members (23%) reported having issues with "performance concerns" ($p < 0.05$). Means by role indicated that nursing assistants (28%) and staff nurses (20%) were more likely to have concerns than managers (12%). These findings suggest that nursing personnel are the ones who make the most contributions to patient care and may provide insight on systems and processes that are lacking. These data provide essential information that may give insight into which nursing roles may observe issues in performance at the highest rate. Hospital work environments may have implications in staff performance, job satisfaction, and quality of care. Efforts toward addressing the concerns in a nursing department may aid in the increase of positive healthcare outcomes and patient wellness.

Consumer Perceptions of the Representation of Asian Indians in United States Advertising

Tejasvini Calambakkam

Faculty Mentor: Kelly Cowart (Muma College of Business)

This thesis examines the representation and portrayal of Asian Indians in United States advertising throughout history and its impact on consumer perceptions. Through a review of academic studies, this thesis explores the evolution of Asian Indian representation in advertising. Using a Qualtrics survey, this thesis additionally investigates the effect of current advertising representations on consumer attitudes toward Asian Indians and their portrayals in advertising. It highlights the positive strides made in recent years to promote a more diverse and authentic image. The thesis emphasizes that there is still much work to be done to ensure that Asian Indians are represented accurately and free from stereotypes in advertising to positively impact consumer perceptions. This thesis contributes to the larger conversation around diversity and representation in media and provides insights for advertisers, marketers, and content creators to create more inclusive and authentic representations of Asian Indians and other marginalized groups that positively affect consumer attitudes and behaviors.

Cadmium Toxicity Induces Pyroptosis In Macrophages

Samuel Camilli

Faculty Mentor: Narasaiah Kolliputi (Morsani College of Medicine)

Cadmium (Cd) toxicity contributes to chronic obstructive pulmonary disease (COPD) and other smoking-related lung disease. Caspase-1, gasdermin D (GSDMD), and gasdermin E (GSDME) are key proteins responsible for the initiation of pyroptosis. We hypothesize Cd induces host immune and inflammatory cell death in a macrophage model (RAW 264.7). RAW 264.7 macrophages (derived from Abelson leukemia virus) were cultured and plated in 4 groups of triplicates. Each triplicate received 0, 5, 10, or 15 μM of CdCl_2 . After 24h cells were collected and lysed. Western blot analysis was then run for gasdermin D (GSDMD) and gasdermin E (GSDME). A Caspase-1 Activity Kit (ImmunoChemistry Technologies) was used with fluorescent inhibitor of caspase (FLICA) staining to assess caspase-1 activity in live cells. A dose curve shows increasing cytotoxicity as Cd concentration increases with 0% cell viability at 100 μM Cd. The doses that hover around 50% cell viability were the experimental 5, 10, and 15 μM . Western Blot data show significant cleavage of GSDMD at 5 μM Cd and significant cleavage of GSDME at 15 μM Cd. Fluorescence microscopy revealed increased caspase-1 activity in treated macrophages. Cd toxicity induces pyroptosis in macrophages via upregulation of canonical inflammasomes and caspase-1, suggesting mechanistic targets to reduce the adverse effects of Cd toxicity on the immune system. Future studies will aim to characterize the mechanisms of Cd toxicity in other programmed cell death pathways.

Trauma Incarcerated: Investigating the Link Between Adverse Childhood Experiences and Adult Criminal Offending Behaviors

Presley Camp

Faculty Mentor: Alora McCarthy (College of Arts and Sciences)

Different forms of childhood trauma have often been associated with a variety of psychological difficulties and problematic behaviors that continue into and throughout adulthood. Many studies have also found childhood trauma to be highly prevalent in

incarcerated populations. However, literature varies widely on the definition of childhood trauma, and the connections to criminal behavior tend to remain very broad. Therefore, the current study seeks to investigate a more refined objective by examining the relationship between childhood trauma—using a more defined, inclusive spectrum—and frequency of adult criminal offending behaviors through self-reported data. Among a sample of 1,000 incarcerated individuals at a local county jail, having more traumatic experiences as a child was significantly correlated with having a higher frequency of violent, and total offenses in the 12 months prior to interview, as well as a higher frequency of lifetime arrests. Further research in childhood trauma and criminal behavior is needed to better implement trauma-informed prevention and intervention strategies.

The Peculiar Beverage: Women’s Agency through the Alcohol Trade and its Loss Following the American Revolutionary War

Aaron Carbone

Faculty Mentor: Richard Byington (College of Arts and Sciences)

A Woman in a role of economic stewardship, within eighteenth to early nineteenth-century America, is often seen as unrealistic. Yet, women were at the top of an industry in the early 1700s, and more specifically until the American Revolution. This business was the rum industry, and the masculinization of brewing after the Revolutionary war was one of the greatest assaults on agency in early American history. This loss of agency devolved into the absoluteness of the patriarchy, and the transfer of all responsibilities associated with brewing. Additionally, the historiography of this topic is vast, and well-founded through the tireless efforts of many historians. My goal is to place this paper in the historiography by asserting that women had a huge amount of agency in early America through the substance of alcohol, George Washington was instrumental in taking away this progress, and the birth of the new nation-state further robbed women of freedom.

Globalization, Radicalization, and Islamic Feminism

Samantha Carrera

Faculty Mentor: Nazek Jawad (Undergraduate Studies)

Urban terrorism has been a predominantly male phenomenon throughout history. As a result, women involved in such movements are often overlooked under the common notion of female pacifism. However, as women start to receive the same acculturation of men in countries embracing new industry due to globalization, they are also becoming more and more radicalized. While an increased political engagement can be an opportunity for a positive change, many women are seeking violent methods to address political issues. Research bridging globalization processes and the radicalization of women needs to be further explored in order to properly address the political and social implications. This project explores the impact of technology, which is one of the driving forces of globalization, on foreign recruitment, and the methods in which extremist groups recruit and continually radicalize women in the region and abroad, including dating apps and websites. On the other front of the issue, are also Islamic feminists contributing to peaceful solutions. Thus, this project aims to highlight both radicalized and progressive women’s response to political struggles.

Identification and Analysis of Functional Genes in the Phage Azira

Maria Cavasini, Naleena Gaskin, Tyler Serrano, Corissa Quarterman

Faculty Mentor: Richard Pollenz (College of Arts and Sciences)

Bacteriophages are the most common organisms on Earth and are used for fighting infections to antibiotic resistant bacteria. Azira infects the Gram positive *Gordonia rubripertincta* NRRL B-16540 strain. The goal of this project is to annotate the Azira genome and define the genes with known functions. Genes were annotated using HHpred, NCBI Blast, PECAAN, DNA Master, Starterator, Phamerator, TOPCONS, SOUSI, TMHMM and lipoprotein detector. Gibbous and Survivors are the phages with the highest similarity to Azira. It was possible to assign functions to 54% of the Azira's genes. The genome of this phage is similar to other siphoviridae actinobacteriophages as it has multiple structural genes towards the 5' end of the genome upstream of the tape measure protein (gene 20). This includes: the terminase small subunit and large subunit (genes 2 and 7), the portal protein, scaffolding protein, major capsid protein, tail assembly chaperones and the tape measure protein (genes 8, 10, 12, 18, 19 and 20 respectively). In the 3' end of the genome there are many diverse gene calls including: a unique lysis cassette (genes 24-28), a metabolic operon between genes 41-50, DNA primase/helicase (gene 56) and HNH endonuclease (gene 70). Azira is one of 20 CT cluster phages. Understanding these phages will provide insight into phage evolution and the way they interact with each other and the environment. This innovative genome may allow Azira to overcome bacteria adaptations. Future research should focus on how Azira infects and lyses Gram-positive bacteria.

An Analysis of Pedestrian Focused Transportation Systems on the USF Tampa Campus

Sarah Davis

Faculty Mentor: Seth Cavello (College of Arts and Sciences)

Pedestrian-focused transportation policies and infrastructure on college campuses is dependent on usability, safety, and the connection to surrounding areas. To do this, I asked two questions: 1) how the multimodal transportation network on University of South Florida's (USF) Tampa campus functions in regards to usability and safety, 2) how do the policies for pedestrian-focused transportation and infrastructure at USF's Tampa campus compare to the immediate surrounding area? I used document analysis, observations, and a survey to examine the pattern between usability, safety, and policies in regards to the multimodal transportation network. I found that the relationship between usability and safety in the transportation network largely depended on the policies in place and the influence from the surrounding area. In conclusion, the pedestrian focused transportation system on the USF Tampa campus is inadequate based on usability and safety due to the influence of the surrounding car centric transportation systems.

Assessing the Wastewater Treatment Potential of *Chlorella* Species Through a Benchtop Photobioreactor

Celia DeVito

Faculty Mentor: Daniel Yeh (College of Engineering)

Currently, a major percentage [1] of wastewater finds its way to our water bodies, which causes an increase of nutrients, at times creating harmful algal blooms. Urine is a difficult aspect of wastewater to treat, because of its high nitrogen and phosphorus

concentrations [2]. Non-harmful algae, specifically *Chlorella* species, have been researched in wastewater treatment to assimilate nutrients in a closed-system, such as a photobioreactor (PBR)[3]. In an effort to investigate *Chlorella sorokiniana* potential at assimilating these high levels of nutrients found in urine, a bench-sized PBR was started. For this research, a 4L culture of *C. sorokiniana* was initially grown on a synthetic dilute urine feedstock using an Agrobrite fluorescent full spectrum light, receiving $150 \mu\text{mol m}^{-2} \text{s}^{-1}$ continuously (24 hours). To begin acclimating the algae culture to real urine, a second PBR was made. This “daughter culture” (DC) started receiving a 5% diluted actual urine feed and increased weekly up to a 40% dilution. Total nitrogen, ammonia, and nitrate were tracked throughout the eighty-day trial, acclimating DC from 169.58mg/L of ammonium to around 3,200mg/L. To monitor the health of the algae, pH, dissolved oxygen, and optical density were recorded throughout the trial. The overall health of the algae was well maintained throughout the trial, up to the 40% dilution. The concentrations of total nitrogen, ammonia, and nitrate increased steadily as the urine dilution was increased throughout the trial, a possible indicator of *C. sorokiniana* assimilating to urine.

Simulation of Pembrolizumab production using Mammalian Cell Bioreactor

Isaac Diaz Becdach, Bao Khanh, Rylan Taylor, Alex Tang

Faculty Mentor: Dr. John Kuhn (College of Engineering)

This project presents the design and analysis of a fed-batch mammalian cell bioreactor to produce Pembrolizumab, also known as Keytruda, a monoclonal antibody used in the treatment of various types of cancer. Relevant reactions and side products were modeled using MATLAB. Material balances were conducted to analyze the concentration of glucose, residual cell biomass, dissolved oxygen, lactic acid, and antibody throughout the bioreactor volume. The results indicated that glucose, residual cell biomass, and dissolved oxygen concentrations did not change significantly, while the reactor medium volume increased linearly, and the concentrations of lactic acid and antibody increased continuously. Energy balances were also performed, and it was found that the bioreactor required positive heat duty, which decreased over time. The optimal feed flowrate for the cell medium was determined to be 0.1 L/h, and the optimal glucose concentration in the feed was suggested to be 4 g/L, resulting in a mass of 0.6657 mg of antibody produced. The inlet temperature was identified as the key factor in controlling the heat duty of the reaction, requiring a minimum of 1.24 watts and a maximum of 1.33 watts after 24 hours. The production of carbon dioxide led to an increase in the reactor volume, which required additional steps to reduce the volume to its initial level. Overall, this study provides valuable insights into the design and operation of a fed-batch mammalian cell bioreactor for the production of Pembrolizumab, offering a small contribution towards the development of more cost-effective processes for this important cancer treatment.

Natural Killer Cell Receptors (NKR) Expression Modulates T Cell Effector Function in Vitro

Isaac Diaz Becdach

Faculty Mentor: Dr. Daniel Abate-Daga (College of Arts and Sciences)

Natural killer cell receptors (NKR) expression and effects on T cell effector function remains elusive. Our work aims to elucidate the influence of NKR expression in the effector function of T cells bearing a transgenic T cell receptor (TCR) that recognizes the SSX2 antigen. Two mechanisms for T cell inhibition were hypothesized: i) a steric hindrance of the T cell receptor (TCR)/peptide-HLA-C1 (pHLA-C1) complex, or ii) a direct inhibition of TCR signaling. Lentiviral transduction was used for SSX2 expression in a U266 cell line. SSX2 protein expression was validated using western blot. We generated HLA-C1-deficient (HLA-C1^{-/-}) U266

cells by using CRISPR/Cas9. HLA-C1-/- U266 cell line were validated by flow cytometry analysis of HLA-C expression. T cells expressing a SSX2-specific TCR, with or without NKR overexpression, were generated using retroviral vectors. TCR-T effector function was assessed in vitro using bioluminescence-based cytotoxic assays. In vitro, in absence of NKRs, (SSX2)-TCR-T cells cocultured with their SSX2-expressing U266 targets efficiently exerts a fully competent cytolytic response regardless of HLA-C1 expression. On the contrary, NKRs overexpression inhibited (SSX2)-TCR-T cell effector function in presence of the HLA-C1 ligand. NKRs expression impairs TCR-T cell effector function, in vitro, in an HLA-C1-dependent manner. Further experiments are needed to understand the influence of NKRs expression in the cytokine production function of TCR-T cells. These results provide valuable insights into NKR-mediated inhibition of T cell cytotoxicity and we propose blocking the function of NKRs as novel targets for the enhancement of cancer immunotherapies.

Lost Crop to Superfood: The Impacts of *Lepidium Meyenii*'s Growth and Popularity

Shayna Dimmer

Faculty Mentor: Anna Dixon (College of Arts and Sciences)

Lepidium meyenii Walp. (maca), once considered a “lost crop” of the Inca, has had tremendous growth in popularity since the 1980s. This growth is due to its claimed health benefits, including increased fertility in both men and women, and has led to maca being labeled as a “superfood”. Numerous studies have attempted to determine whether maca has any bioactive compounds that support the health claims associated with it. However, little research has focused on the negative cultural impacts that maca’s popularity has caused, especially on the farming practice and economy of the Andean people. This research outlines the effects of maca’s popularity in the West and analyzes the equity of the continued use of products containing maca.

Residual Symptoms of Posttraumatic Stress Symptoms in Children after Treatment

Jessica Doiron

Faculty Mentor: Alison Salloum (College of Behavioral and Community Sciences)

There are effective trauma-focused treatments for children, but like adults, many children complete treatment and still have posttraumatic stress symptoms (PTSS, i.e., PTSS residual symptoms). Objective: The purpose of the study was to identify the most common PTSS residual symptoms among children ages 4-12 who have completed trauma-focused cognitive behavioral therapy (TF-CBT) and Stepped care CBT for children after trauma. Method: Secondary data was used for this study from a randomized clinical trial with 183 children (ages 4-12) and their caregivers who participated in TF-CBT and Stepped care CBT for children after trauma. The Diagnostic Infant and Preschool Assessment was used to assess PTSS for children ages 4-6 and the Kiddie Schedule for Affective Disorders and Schizophrenia was used to assess PTSS for children for ages 7-12. Descriptive statistics were used to identify common PTSS at baseline, post-treatment, and 6 and 12 months. Results indicated that there were four residual symptoms that remained high (i.e., over 14%) at post-treatment, and at the 6 and 12-month follow-up: psychological distress at reminders, hypervigilance, sleep disturbances and exaggerated startle response. Limitations: Using different interview schedules for young children and older children may have influenced the findings, as well as the inclusion of including only those children who completed treatment. Clinicians ought to monitor and tailor trauma-focused treatment to address children’s PTSS for arousal symptoms (i.e., hypervigilance, sleep disturbances and exaggerated startle response) and psychological distress at reminders. Treatment methods should include ways to help children cope with future trauma reminders.

The Front Line: Impact of COVID-19 on Beliefs and Behaviors Among University Students

Kelly Nicole Drago, Ariel Gomez Garcia, Nicole Nagib

Faculty Mentor: Donna Lee Ettl-Gambino (Judy Genshaft Honors College)

Despite the national push, it is unknown to what extent university students have adopted CDC guidelines to mitigate the spread of COVID-19. Frontline workers are a crucial element society's stability and employers need to provide the necessary tools/ education for the safety of their employees. The purpose of this study was to improve our understanding of how university students aligned with CDC recommendations. A MANOVA was conducted to identify differences among groups. The independent variable was the university students' employment status (frontline worker or not). The dependent variables were the students' agreement with the following CDC guidelines: 1) Wear a mask indoors; 2) Wear a mask outdoors; 3) Dined at restaurants; 4) Believed in CDC information; and 5) Believed vaccines protected patients from COVID-19/variance. There were statistically significant findings as evidenced by Wilks' $\Lambda(6, 587)=3.93, p<0.05$. Three criteria were found to be statistically significant: 1) Over half (57%) of university frontline worker/students reported they wore a mask outdoors ($p<0.003$). 2) Numerous (85%) of university frontline worker/students reported they often dined out at restaurants ($p<0.023$) Most (82%) of university frontline worker/students reported they believed that the vaccines would protect them from COVID-19 and variants ($p<0.005$). CDC guideline adherence is imperative for frontline worker safety/protection. COVID-19 policies are not being followed by frontline workers within the workplace. This information may assist policymakers and other key stakeholders in Florida and nationally in identifying, designing, and implementing strategies to provide frontline workers with the appropriate tools that will assist them in maximizing their safety.

Filamin A Dysregulates the Structural Integrity of Macrophages Exposed to Cadmium

Ritaj El Ghissassi

Faculty Mentor: Narasaiah Kolliputi (Morsani College of Medicine)

Cadmium is a highly toxic metal that can enter cells through various environmental interactions, namely cigarette smoke. It induces toxicity in the lungs, among other major organs, which prompts apoptotic cell death. Filamin A (FLNA), a scaffold protein that cross links actin filaments and links actin filaments to membrane glycoproteins, mediates the cytoskeleton in accordance with changes in shape and migration. A better understanding of this caspase-dependent cell death can be achieved by examining the role of FLNA in regulating this process. RAW cells were exposed to varying concentrations of CdCl₂ (5uM, 10uM, 15uM) for 24 hours, as determined by an assessment of the cytotoxicity. Through Western Blot analysis, protein expressions of FLNA, Caspase-3, and Caspase-1 were determined. When compared to controls, Cd-treated cells showed greater expression of FLNA, Caspase-1, and Caspase-3. The data suggests that Cd activates FLNA and thus Caspase-1 and Caspase-3 in RAW cell macrophages, leading to apoptosis and consequent inflammatory symptoms.

Does Storage Method Influence DNA Recovery from Anoa Fecal Samples?

Nadine Elzeidy

Faculty Mentor: Michelle Green (College of Arts and Sciences)

The lowland anoa (*Bubalus depressicornis*) are dwarf buffalo mainly found in Sulawesi, Indonesia. This charismatic fauna is named for their habitat in lower grounded areas. There are also mountain anoa who live in higher altitudinal areas. The lowland anoa's habitat consists of moist forests and green lands. The anoa hold cultural significance to native Indonesians who honor them in rituals or come together and have the anoa as a familial meal. The anoa population used to be widespread within Sulawesi. Their population density has decreased significantly and there is no subpopulation greater than 250 individuals. Their population is primarily decreasing because of human involvement. This includes deforestation to their natural habitat for building farms, housing, and the urbanization of their domain. Only 11.9% of their island is protected and though there are some laws, they are not enforced. The lowland anoa are experiencing declines of more than 20% of their population each generation. Therefore, not only is conservation research needed to be done on the lowland anoa, but noninvasive molecular research. Genetic diversity is key to species recovery and noninvasive samples are a source of genetic material. In order to better inform conservationists in Indonesia, we will test two storage methods for fecal samples. We expect no difference in DNA recovery between the two storage methods. With noninvasive methods, we can study the lowland anoa without endangering them further or causing trauma to these already small subpopulations. This is necessary to the conservation and the preservation of lowland anoa.

Humor: A Practical Teaching Tool to Enhance Student's Learning

Elliot Hermann, Olukemi Akintewe

Faculty Mentor: Olukemi Akintewe (College of Engineering and Morsani College of Medicine)

Instructional humor is vital in students' learning, knowledge retention, active participation, motivation, and stress reduction. Integrated humor in the classroom aids the retention of information, student engagement, and performance while decreasing stress-induced anxiety [1-2]. Humor indirectly promotes a conducive learning environment that helps keep students interested and motivated in various subjects. When humor is combined with laughter, a relaxed learning atmosphere is fostered. This study reviews the impact of humor on learning in the college classroom. It is hypothesized that humor is an effective pedagogical tool to promote student engagement and learning. A literature review was conducted across various databases (Pubmed, EBSCO, APA PsychInfo, Scopus, Web of Science) primarily through keyword searches like humor, pedagogy, teaching, laughter, and learning. Four hundred and six (406) scholarly articles were compiled and reviewed using Rayyan. Different exclusion [not specific to a hypothesis, wrong study design, or outcome] and inclusion criteria were applied. The reviewed research articles (n=144) indicate an improvement in the learning environment for students exposed to humor compared to control groups. When exposed to integrated humor, a significant increase in student success was achieved in multiple dependent variables (mathematics, memory, linguistic aptitude). Specifically, the studies defined humor through jokes, laughter, anecdotes, and other forms of interaction that create a more comfortable environment for students. The strategic implementation of humor in the classroom is a highly effective pedagogy tool that aids comprehension of different subject matter. Students can understand concepts and retain information better when humor is integrated, thus enhancing students' learning.

The Impact of Artificial Intelligence on Information Systems that are Integrated into University Databases

Sophia Hower

Faculty Mentor:

Artificial Intelligence (AI) is taking over our world every day. Technology has become so advanced that as a society we are having to learn to work and coexist with AI, rather than fight against it. The opinions on AI can be quite conflicting. Some people believe that the development of AI is helpful and creates efficiency and productivity, while others believe that AI leads to more errors, system failures, and the replacement of human jobs. Universities are one of the many institutions that use AI to better serve its population. This is accomplished through the integration of AI chatbots in university websites to increase student satisfaction and support. While this new addition to student assistance can be extremely helpful, they have limitations, such as the lack of extensiveness of the query list. This limitation is a main reason why students struggle to receive the help and support they need. This study investigates the use of AI chatbots by universities and evaluates its effectiveness through usability analysis, surveys, and interviews. The paper provides a blueprint to improve the student chatbot experience.

The Implications of Violent Conflicts on Women's Access to Healthcare: The Case of Iranian Women after the Iran-Iraq War

Antara Islam

Faculty Mentor: Nazek Jawad (Undergraduate Studies)

The implications of violent conflicts on women's access to healthcare is a very critical issue, due to the far-reaching consequences on women's health. This paper examines how the Iran-Iraq War has affected women's access to healthcare in Iran, and how this government-controlled sector has been affected in general. Due to the very broad nature of 'healthcare' in regards to women, this research specifically seeks to address the ways in which access to mental health, access to vaccinations, and access to reproductive healthcare has been affected by conducting a comparative analysis and examining women's access to the beforementioned healthcare services before and after the Iran-Iraq War. The research will mainly be carried out through research articles found online, data from government websites, as well as important first-person voices of Iranian women on social media platforms. This paper highlights the political implications of violent conflict, including the lack of protection of human rights, and more specifically women's rights, and the lack of women's access to the political process that is needed to influence the laws the policies, which directly affects women's access to healthcare.

Confronting Offensive Behavior: Effects of Power, Gender, & Personality

Kyra Kalodimos

Faculty Mentor: Mark Pezzo (College of Arts and Sciences)

Little research has been collected on why people get offended, even if we are prone to overestimating how much other people are offended by a behavior (Pezzo et al., 2023). We set out to test 116 participants from USF to see if another person's annoying, non-normative behavior creates a predicament where telling this individual to stop is a norm violation in itself, possibly causing participant frustration and offense. After presenting a scenario in which the participant was told they would be trapped in a

car with their male or female boss or coworker, we examined levels of offense and discomfort. We found that behavior is more offensive when the target is male no matter their occupation, $F_{\text{Target Gender}}(1, 112) = 5.50, p = .021, d = .43$, but that the female boss garnered the most discomfort from participants. Discomfort at asking the person to stop did not predict offense ($r = -.11, ns$). It is evident that both gender and power have effects upon discomfort and offense, but that further study is warranted, along with deeper consideration into what the term “offense” operationally entails.

Evaluation of the Sensitivity and Specificity of Human-Associated Escherichia Coli Accessory Genes as Potential Markers for Microbial Source Tracking

Ruchi Korde

Faculty Mentor: Valerie Harwood (College of Arts and Sciences)

The human-associated H8 accessory gene in *Escherichia coli* is one of the potential microbial source tracking (MST) markers used for source identification of human fecal contamination, including sewage, in environmental waters. However, this gene has also been found in *Klebsiella*, a species ubiquitous to aquatic environments. A second accessory gene, H12, has been proposed as an alternative human marker to H8. In this study, culture and quantitative PCR (qPCR) methods were used to determine the specificity and sensitivity of H8 and H12 genes. Five fecal samples from eight different animals and influent samples from two wastewater treatment plants were tested for presence of these marker genes. Two animal fecal samples (one deer and one chicken) tested positive for the H8 gene, and nine tested positive for the H12 gene (two deer, two chickens, one duck, three horses, and one shore bird). Concentration of the H8 gene was an order of magnitude higher than the H12 gene in sewage. A BLAST search for H12 gene sequence on the NCBI database revealed that it is also found within *Salmonella enterica*, which is present in human and animal intestinal tracts, and *Raoultella planticola*, a bacterium ubiquitous in aqueous environments. The H12 gene has lower specificity (76.9%) compared to the H8 gene (94.9%). H8 and H12 genes demonstrated similar sensitivity values (both 100%). Prevalence of the H12 gene (1.67%) in sewage was lower than the H8 gene (15.56%). Based on these results the H12 gene is not a viable marker for source tracking purposes.

An Examination of Altruistic Marketing Intent Across Profit, Planet, and People

Caleb Krassner

Faculty Mentor: Carol Osborne (Muma College of Business)

Companies may use altruistic marketing as a mechanism to enhance brand values alongside strengthening the consumer-brand relationship. The positive relationship-building discoveries, as well as negative brand reputation discoveries, throughout altruistic marketing’s history of trial and error show how this field is constantly changing with new experimentation on the horizon. As society shifts with millennials becoming the largest group of purchasing power, their keen interest in companies that participate in corporate social responsibility will shape how brands are built or rebuilt. This paper will examine how companies can leverage altruistic marketing while taking into consideration a tripartite focus on profit (including philanthropy), planet (environmental protection), and people (e.g., workers, communities, and general welfare) to (1) improve society and the environment, (2) build stronger consumer-brand relationships, and (3) repair consumer-brand relationships when problems arise, where specific relationship-repair methods will be proposed.

We Stand for Ourselves: The Non-Cisnormative Origins of the Stonewall Riots

Christy-Lynne Lapine

Faculty Mentor: Adrian O'Connor (College of Arts and Sciences)

The Stonewall Uprising was a pivotal moment in the LGBTQ civil rights movement, but the catalyst for the first night's violence has been elusive. In trying to fit the night squarely into a timeline of 'gay' rights or the overall civil rights movements of the decade, the struggles of an important group have been overlooked and key evidence left out of the overall narrative. Only by noting the long history of drag, transvestite, and transsexual people leading up to that momentous event in June, 1969 and how they were the focus of police actions that night can we understand what set off everything that came after.

Tots, Tweens, Teens & Technology: Transforming Wait Time Experience

Chloe Maeve Lemstrom, Elizabeth Nicole Miehl, Sean Landreth Smith, Nicole Nagib, Kelly Nicole Drago

Faculty Mentor: Donna Lee Ettl-Gambino (Judy Genshaft Honors College)

Long waiting times in health care remain a challenge, especially in pediatrics. Wait time is considered one of the most important indicators of healthcare quality. Long waits may delay diagnosis and treatment which may lead to increased morbidity and escalated patient dissatisfaction. Evidence suggests that the patient's perception of wait time may be a more accurate indicator of their visit satisfaction rather than their actual wait time. The purpose of this study was to better understand if providing pediatric patients with age-appropriate video games or single user electronic gaming devices would positively influence their experience in the outpatient clinic setting. A MANOVA was conducted to identify differences across groups. The independent variable was the patients' grade level. The dependent variables were the patients' agreement with the following survey statements: 1) preferred playing with others; 2) would utilize single use electronic devices if provided; 3) has access to a personal computer; 4) has access to a phone; 5) enjoys playing outside; and 6) playing video games. The following one criterion was found to be statistically significant: 1) Over half (55%) of the pediatric patients reported they "play with video games" ($p < 0.01$). Means by grade level showed that high school (80%) and middle school (78%) were more likely than elementary (59%) or preschool (28%) students. It would be especially beneficial if pediatric clinics offered a video game/single user electronic device to pediatric patients of middle and high school age in their waiting rooms. The clinical setting is rarely enjoyable for pediatric patients; therefore, healthcare administrations should attempt to make the existing environment appealing and interesting for today's younger generation—which includes implementing modern technologies.

SNOW CRASH: How the upcoming METAVERSE changes the nature of ADVERTISING for both CONSUMERS and BUSINESSES

Noah J. Levin

Faculty Mentor: Carol Osborne (Muma College of Business)

Over the past few years, we've seen a meteoric rise in Web3, metaverse, and decentralized technology. This paper delves into commentary and interviews sourced from industry leading experts to understand how the metaverse will affect consumers in business and advertising.

Commercial Kit Comparison for DNA Recovery in Ethanol-Stored Fecal Sample

Adriana I. Lopez

Faculty Mentor: Michelle Green (College of Arts and Sciences)

Anoa are a species of mammal under the Bovidae family endemic to Indonesia; specifically the Sulawesi region. The species is subdivided into the lowland anoa and the mountain anoa. Classified as endangered, there are a reported 2,500 Anoa total in existence. Observations of Anoa in the wild have been scarce because of their solitary nature; a majority of data has been collected on captive groups. The biggest threats Anoa face are hunting and habitat destruction. Unregulated hunting for collection of trophies or hunting for cultural rituals combined with gradual habitat destruction has contributed to dwindling numbers over the years. Conservation efforts have led to regulatory hunting legislation and environmental conservation as well as attempts to garner support for the Anoa by the surrounding and outside communities. Sanctuaries and zoo facilities have also been vital to learning more about the species and initiating breeding programs. Part of the conservation effort includes determining the genetic diversity of the remaining populations. Genetic sampling of the anoa is particularly challenging given their small population sizes, solitary lifestyle, and relatively small body size. Fecal samples provide a noninvasive alternative for genetic sampling. Ethanol is a common storage method for genetic samples. However, if ethanol is carried over into isolated DNA, it reduces the quality. There are many commercial DNA isolation kits to choose from, but it is unknown whether kit type will influence DNA recovered from ethanol-stored fecal samples. The results of this study will provide information to better inform conservation strategies in Indonesia.

Exploring Relationships of Political Affiliation and Interest in the News

Lacorya Lynn, Heleana Bentley, Reilly Orman, Marcus Cumberbatch

Faculty Mentor: Sandra Schneider-Wright (College of Arts and Sciences)

What gets people to read the news? We explored whether political affiliation predicts the kind of news headlines that captures people's interest. We showed participants multiple different headlines about current topics. These headlines were designed to be neutral in tone. For each headline, we measured their interest in and likelihood to read the article. We also measured how realistic they thought that the headline was, and whether they thought the article would be fact-based. At the end of the study, we also asked for their political outlook and how often they read news articles. A correlation analysis examined whether political outlook or tendency to read the news can predict the topics deemed interesting. Many headlines tended to be more popular among liberals, with almost no headlines being more popular among conservatives. Few relationships were observed between headlines and tendency to watch the news. We summarize the patterns we observed.

Microplastics Reduce Symbiosis Re-Establishment in a Coral Model (Aiptasia)

Anna Beatriz Machado

Faculty Mentor: John E. Parkinson (College of Arts and Sciences)

Microplastics are a growing concern to society: over 19 tons of plastic enter the ocean every hour. Microplastics impact marine life, but little is known about how they affect cnidarian-algal symbioses. These associations are foundational to coral reef ecosystems and are increasingly threatened by human drivers, including pollution and climate change. Using a model sea

anemone system, we monitored symbiosis establishment between host polyps (H) and microalgal symbionts (S) that had been cultured (+) or not (-) in artificial seawater with a 0.3mg/mL concentration of PVC microplastics for 7 weeks prior to inoculation. Aposymbiotic sea anemone polyps (n = 8 per treatment) were individually exposed for 48 hours to 5×10^5 symbiont cells per [mL]⁻³ in a full factorial design (H+S+; H+S-; H-S+; H-S-) and sampled at 48 hours, 1 and 2 weeks post-inoculation to track the progress of symbiosis establishment. Symbiont abundance in each polyp was quantified via two methods: fluorescence microscopy and automated cell counts on a Countess II instrument. Symbiont density was normalized to host protein content via Bradford assays. Our results indicate that exposure to microplastics reduces symbiont colonization rates. Thus, microplastics negatively impact a key ecological process, with implications for coral recovery after heat-induced coral bleaching events.

Cadmium Induces Phosphorylation of MAPK Cell Death Pathways in RAW 264.7 Murine Macrophages

Tanush Madavarapu

Faculty Mentor: Narasaiah Kolliputi (Morsani College of Medicine)

Cadmium induces phosphorylation of MAPK to induce cell death in RAW 264.7 macrophage cells

Tanush Madavarapu, Samuel Camilli¹, Carli Busler, Apoorva Desaraju, Ritaj El Ghissassi¹, Narasaiah Kolliputi

Introduction: Cadmium (Cd) is a toxic metal that humans are constantly exposed to, typically through the smoking of cigarettes. The effects of Cd on MAPK phosphorylation in Raw 264.7 macrophage cells is not fully determined. Methods: RAW cells were exposed to varying concentrations of CdCl₂ (5uM, 10uM, 15uM) for 24 hours. Protein expression of ERK, JNK, and p38 MAPK was determined using Western Blot analysis. The concentration of TNF- α was determined using ELISA kit. Results: Expression of ERK, JNK, and p38 MAPK was higher in Cd-treated cells when compared to controls. Likewise, increased concentrations of TNF- α correlated with higher concentrations of Cd treatment. Conclusion: The data suggests that Cadmium activates phosphorylation of MAPK cell death pathways which causes an increase in inflammatory factors.

Calculation of Levels of Current-Use Pesticides and Potential Exposure via Indoor Dust in Daycare Centers

Brian Madriz

Faculty Mentor: Henry Alegria (College of Arts and Sciences)

Indoor dust was collected from seven sites in the Tampa Bay area. Levels of selected current-use pesticides were measured. Potential exposure to these pesticides among toddlers was calculated. This poster presents the results of this study.

The Power Within: Clarifying the Wooing Tales of Celtic Women

Tia Moriarty

Faculty Mentor: Jennifer Knight (College of Arts and Sciences)

Ancient Celtic wooing tales are stories that encapsulate love, greed, motivation, and the toils that come with proving one is worthy of another's affection and dedication. This project delves into Celtic wooing tales as a singular entity and discusses how women hold power within those tales. The wooing tales that are used for research include The Wooing of Emer, Wooing of Etain, and Wooing of Becfhola. These wooing tales show women using their emotional and physical power in a society that limited their upward mobility and political influence. Analyzing the women's actions within the social spheres of love and wooing practices will increase understanding of how women expressed power in a limited system. By summarizing how the women are portrayed by the authors of their stories, accepted by historians, and what their appearance suggests of ancient Celtic culture and the perception of the act of wooing women, the understanding of wooing tales and, consequently, the social structures within them will be further clarified. This research seeks to answer what power women held, if any, in these wooing tales and how they acted on that power. Many wooing tales focus on labors men finish in order to prove they are worthy of a woman's love. By reading the wooing tales as a singular entity together, the deeper themes will become clarified and understood.

Caffeine Effects on EEG Waves

Gabriela Mwelwa, Darlin Guerra Diaz

Faculty Mentor: Christian Brown (College of Arts and Sciences)

Many studies have proven that caffeine has biological effects. Different procedures measure the effects of caffeine; one being via electroencephalogram. Electroencephalograms record the electrical activity of organs such. Studies have shown that under the influence of caffeine, EEG waves are manipulated; therefore this study seeks to evaluate the effects of caffeine consumption on EEG waves. The focus waves are alpha and beta waves which are more pronounced during a relaxed and non-aroused state and a waking, high alert state respectively. Because caffeine is a stimulant, we expect to see a decrease in alpha brain wave activity and an increase in beta waves. The experiment consisted of four trials. An EEG test was taken before as well as 20 minutes after caffeine consumption. Participants were not allowed to consume caffeine the morning of the experiment. During testing, participants closed their eyes for alpha testing and completed mental arithmetic with their eyes opened for beta testing. Our data was analyzed under the t-test method. The statistical significance is set to $p < 0.05$. Alpha data includes $p = 0.0932946$, mean without caffeine: $2.01 \mu\text{V}$ and mean with caffeine: $4.045 \mu\text{V}$. Beta data includes $p = 0.03130103$, mean without caffeine: $1.525 \mu\text{V}$, and mean with caffeine: $3.02 \mu\text{V}$. Our expected outcome proposed that alpha waves would decrease, and beta waves would be reinforced. Our data analysis revealed no effect of caffeine consumption on alpha waves ($t = -2.430$, $d.f. = 3$, $p = 0.093$). However, we did find statistical significance for beta wave data as caffeine did produce an effect ($t = -3.833$, $d.f. = 3$, $p = 0.031$).

The Unequal Impacts of Particular Matter and the Prevalence of Chronic Obstructive Pulmonary Disease(COPD) in the Native American and Alaskan Native Community

Ebu Ojogwu

Faculty Mentor: Narasaiah Kolliputi (Morsani College of Medicine)

The effects of climate change will not be experienced equally across the U.S and many racial groups are still clustered in certain regions of the United States. This can suggest how the effects of climate change might widen the gap in health inequality. Specifically, certain ethnic groups like the American Indian and Alaskan Native populations predominantly live in one region in the United States. This can cause them to be more vulnerable to the effects of climate change in comparison to other ethnic groups who are evenly dispersed throughout the United States. Current studies have examined air pollution from particular matter (PM10 and PM2.5) and its implications on pulmonary health; however, the health disparities resulting from long-term exposure need to be further examined. This study will have three objectives: (1) the concentration of PM differs throughout the United States, (2) the AI/AN population is disproportionately exposed to PM, and (3) the effects of PM on the incidence and mortality of COPD in the AI/AN population. Data sets from the EPA, U.S Census, CDC, and other government health agencies were used alongside articles from PubMed to run statistical tests so trends in the data can be identified. States in the western United States, thus the AI/AN community had greater long-term exposure to particular matter. The greater exposure to PM can be correlated to the increased mortality from COPD in the AI/AN community. These associations can further implicate the disparity between COPD and the effects of climate change in the AI/AN community.

Decisional Capacity to Consent among Youth Living with HIV: Preliminary Findings from a Pilot Study

Coleman O'Toole, Serena Wasilewski, Eric Sumpter, Kaitlyn Ligman

Faculty Mentor: Tiffany Chenneville (College of Arts and Sciences)

The ethical, legal, and policy issues associated with research among youth are well documented. Among these include issues related to consent/assent and how best to balance autonomy and protection when conducting research with vulnerable youth including youth living with HIV (YLWH). This ongoing randomized controlled pilot study explores the feasibility and acceptability of an intervention designed to improve the decisional capacity of YLWH to consent/assent to HIV research. Using a between- and within-subjects design, adolescents and young adults (13-24) living with HIV are randomly assigned to either a control (standard operating procedure [SOP]) or an intervention (multimedia process) consent/assent condition. Following exposure to condition, participants complete the University of California Brief Assessment of Consent Capacity (UBACC) and then subsequently complete the alternate condition. Finally, participants complete an acceptability questionnaire to assess perceptions of each condition. Although data collection is ongoing, preliminary data from 17 participants (8 control, 9 intervention) enrolled to date suggest that, overall, participants prefer the multimedia process over the SOP; are more satisfied with the length of the multimedia process, even though the SOP takes slightly less time to complete; and encounter no difficulties with the multimedia consent process. However, UBACC scores reveal little difference in decisional capacity between groups. Participants in both conditions failed to meet a predetermined cutoff score even though participants expressed more confidence in their understanding of the research study following the multimedia consent process. The potential implications of this research for improving research integrity will be discussed.

MFP-MFI

Isabella Pekar

Faculty Mentor: Adam Carmer (Muma College of Business)

Food insecurity, the lack of access to enough nutritionally adequate food for healthy living, is associated with increased likelihood of chronic disease and has been found to be a better predictor of chronic disease than income. However, there is a current lack of literature and research that engages with how food insecurity impacts the gut microbiome, which plays an important role in maintaining metabolic and brain health. Abnormalities in the gut microbiome can also lead to chronic inflammation, a driver of chronic disease including diabetes, obesity, and cardiovascular cancer. This study, which involves an interdisciplinary group of researchers from multiple departments at the University of South Florida, seeks to determine whether markers in the gut microbiome (e.g., leakiness and inflammation), are distinct in people with higher rates of food insecurity compared to food secure individuals. Therefore, our hypothesis is that microbiome diversity is decreased in food insecure individuals and linked with increased inflammation and leakiness in the gut. Through the administration of multiple surveys and questionnaires amongst adults aged 18-65, we explore food insecurity (USDA Food Security Survey), dietary intake (e.g., ASA24), biometrics (e.g., saliva and stool samples), and cognition (e.g., MoCA). The research team is currently in the recruitment and data collection stage of this research, and will be conducting analysis as soon as our recruitment goals are met. Understanding these potential connections will aid in future microbiome-based interventions and, as a result, help improve the health of people experiencing food insecurity by combining applied research and clinical practice.

BRCA 1 and 2 Mutations and their Relation to Breast Cancer: An Epidemiological Overview

Simone Perciballi, Prachi Misra, Sophia Avila, Taeler Bell, Lisa Dawood, Sarah Murphy, Christian Kaplan

Faculty Mentor: Olukemi Akintewe (College of Engineering and Morsani College of Medicine)

BrCa 1 and 2 are genes that help repair damaged DNA via proteins. Mutations within these genes are responsible for a higher risk of breast cancer. While BrCa positive cancer only accounts for a small percentage of breast cancer, it is the main cause of breast cancer for those who are BrCa positive. Inheriting the BrCa1/2 gene mutation increases the incidence and mortality, and compounds with a familial history of BrCa mutations and cancer. There are many articles describing the susceptibility of populations to certain cancers due to BrCa 1/2 mutations, but they do not show a link between geographical data and other global factors. This systematic review intends to provide a complete overview of the global prevalence and possible factors influencing frequency within varying populations. Beginning with 1500 peer reviewed articles spanning over the past 20 years, we ultimately settled on 99 articles focusing on breast cancer prevalence throughout 7 populations, (Ashkenazi Jews, MENA, Europe, USA, South America, Asia, and Africa), as well as current health disparities and causing factors. A second review process limited the amount of articles to only include specific groups and size of sample in the studies. Compiling this data into charts, we are able to see occurrence and ratio on population to incidence. We focused primarily on diet, genetics, and location as factors that affect susceptibility. By organizing the data into population subsets, we can more accurately see the occurrence of breast cancer in BrCa positive groups globally. We noted an increased breast cancer incidence in the Ashkenazi Jewish population, most likely explained due to being ostracized from Eastern European cities and inbreeding. The majority of the 99 articles were focused on this subgroup. There is a notable increase in prevalence within the Chinese population as opposed to MENA or the United States, most likely due to the same localized nutritional/environmental factors and genetic susceptibilities.

CRISPR Cas9 in Cancer Therapy

Trisha Pitchala, Ashley Carreras, Cecilia Calabi, Gianna Cruz, Gabrielle Johnson, Jimena Rivera, Tanveer Sandu, Christian Kaplan

Faculty Mentor: Olukemi Akintewe (College of Engineering and Morsani College of Medicine)

CRISPR-Cas9 is a gene editing technology that has revolutionized genetic research and medical intervention. A systematic review was conducted on the implications of CRISPR CAS9 on the results of various cancer treatments. The review focuses on the advancements of editing therapies on integrative medicine as well as their ethical and legal conversations. CRISPR is an enzyme that clips segments of DNA, enabling precise changes to the genomic sequence. It has the potential to alter the way cancer is treated by utilizing target-based cancer therapy and amending genetic abnormalities that fuel cancer growth. Research in this area has given geneticists a new perspective on the cancerous genetic mechanisms, further helping them develop treatments that target specific genes. However, this technology brings up moral and legal concerns. Matters such as hereditary modification-based prejudice, challenges with informed consent, and unexpected outcomes due to its technological nascence are a few to mention. Moreover, this has resulted in the extensive use of animal models to test the safety and effectiveness of CRISPR-Cas9 technology, both in basic research and preclinical trials. These in-vivo analyses have advanced our knowledge of the potential uses of CRISPR-Cas9 gene editing in cancer therapy. While ethics undoubtedly play a role in animal testing, this method remains the front-runner in understanding the efficacy of this technology. It was concluded that the intriguing promise of CRISPR-Cas9 gene editing requires further investigation to holistically understand the advantages and hazards associated with cancer therapy to solidify its prominence as a lead therapeutic in the future.

Quantification and Categorization of Microplastics within Soft Tissue of *Crassostrea Virginica* in Bayboro Harbor

Reni Poston-Hymel, Nicole Andersen

Faculty Mentor: Dr. James Ivey (College of Arts and Sciences)

Microplastics are a form of pollution that are a concern for oysters, as the particles can be ingested when oysters filter-feed. This study examined the abundance of microplastics ingested by *Crassostrea virginica* oysters sampled from Bayboro Harbor. The soft tissue of sampled oysters was lyophilized, dissolved, and filtered. The lyophilization of the oysters was a new method intended to account for differences in water content between the samples. The filters were then examined under ultraviolet light using microscopes, where the microplastics were categorized and counted. A mean of 115.8 microplastics/g dry flesh was found from the samples. Fibers made up the majority of microplastics found, with a mean proportion of 0.653616. These results indicate that microplastics are of concern to oysters within Bayboro Harbor, but more research is needed to examine oysters in other areas of Tampa Bay. More research in the prevention of microplastic release into the environment and removal of microplastics from the environment is also needed.

A Historiographical Analysis of Holocaust Accountability with a Focus on the Work of Christopher Browning and Daniel Goldhagen

Megan Proctor

Faculty Mentor: Brian Connolly (College of Arts and Sciences)

Mainstream popular explanations of the Holocaust tend to assign sole accountability for the mass murder to Adolf Hitler and his close advisers, largely ignoring that the genocidal actions were carried out by “ordinary” men. This research evaluates the controversy around the academic theories of Christopher Browning and Daniel Goldhagen and their competing explanation of the genocidal actions of the “common” man who perpetrated the murderous orders of the Third Reich. Browning provides a multifaceted approach in his work “Ordinary Men: Reserve Police Battalion 101 and the Final Solution”, arguing that social military comradery, careerism, and the facilitation of alcohol contributed to the genocidal actions of those in Reserve Police Battalion 101. Browning focuses on the specific genocidal actions the policemen chose to undertake while detailing the opportunities they had to be reassigned. In “Hitler’s Willing Executioners: Ordinary Germans and the Holocaust”, Goldhagen argues that outside forces did not impact the actions of men in Reserve Police Battalion 101; rather, they willingly chose to commit mass genocide out of their own free will. Goldhagen relies on a linear explanation of antisemitism that stretches as far back as Christendom. The specific conclusions reached within this research reframes our historical understanding of how atrocities were and continued to be perpetrated by “ordinary men”.

Maternal Health Information Database

Megan Reddy

Faculty Mentor: Balaji Padmanabhan (Muma College of Business)

The advent of Artificial Intelligence (AI) tools can aid in the early detection and diagnosis of chronic and deadly diseases, reducing maternal and neonatal mortality rates. By using algorithms to sort and organize data, AI can help healthcare professionals identify at-risk pregnancies in the first trimester, allowing for early intervention efforts. The goal of this research involves creating an AI maternal healthcare database to organize, monitor, and predict risks based on pregnancy patterns. To do so, it was necessary to establish a systemic method to target this multifaceted research dilemma. Step one included performing a historical analysis on current maternal health research, and identifying the factors that produce the largest risk to morbidity. A literature review of current healthcare AI platforms include the monitoring of symptoms that may disrupt the normal development of a fetus or mother. However, very few information systems have been able to utilize AI to predict the risk of preterm deliveries, postpartum depression, or other factors. Step two required identifying a comprehensive, yet diverse data set. With the aid of Florida Blue Insurance, a data set was obtained and analyzed for the aforementioned factors. Step three involves the physical coding of the AI platform itself. By inputting age, blood pressure, platelet count, and several other indexes, the AI system can establish an output for the detection of these risks. Future considerations for this project include developing an advisory platform that informs the pregnant individual of the next steps they should take depending on the specific system.

Helpful or Hindrance?: The Relationship Between Helicopter Parenting and Emerging Adults' Guilt- and Shame-proneness

Norma M. Reyes, Amy T. Texter, Wendy M. Rote, Gabriella Ulloa

Faculty Mentor: Wendy M. Rote (College of Arts and Sciences)

Helicopter Parenting (HP) is characterized by developmentally/contextually inappropriate levels of control, protection, or involvement toward a child (LeMoyne & Buchanan, 2011). It is often associated with negative outcomes for emerging adults, including greater depression levels (Schiffirin et al., 2014), in part due to poorer emotion regulation (Wenze et al., 2019). Lower regulation is also associated with greater shame-proneness and less guilt-proneness (Szentágotai-Táatar & Miu, 2017); however, the relationship between HP and guilt- and shame-proneness remains unknown. We investigated whether multiple forms of HP were associated with differences in types of guilt- and shame-proneness and whether the relationship differed between maternal and paternal HP. Approximately 388 college-aged participants (Mage =19.6, 75.5% female) reported on their mother's and father's HP (Luebbe et al., 2018) and their own guilt- and shame-proneness (GASP; Cohen et al., 2011) in SONA. Bootstrapped hierarchical regressions were run separately for mothers' and fathers' parenting, predicting guilt- and shame-proneness from gender and four forms of HP. Controlling for gender, only mother's HP behaviors were predictive of guilt- and shame-proneness. Maternal Information Seeking was uniquely associated with more guilt- and shame-proneness, Academic and Personal Management was uniquely associated with less guilt- and shame-proneness, and Autonomy Limiting was associated with less shame-proneness. Direct Intervention showed no significant associations. As guilt and shame are relatively adaptive or maladaptive respectively, our findings provide evidence that HP may have benefits and downsides for the development of emerging adult's moral emotions and adjustment. Future studies should establish a longitudinal relationship in a gender-balanced sample.

Analysis of Waste Management in Germany and the United States

Elisabeth Reyes-Rivera, Aditi Kanchibhatta, Jenna Koller

Faculty Mentor: Peter N. Funke (College of Arts and Sciences)

This research project will focus on comparing methods of recycling and composting as waste management in the United States and Germany. Currently, the U.S. primarily practices a linear economy wherein products are developed, used, and discarded as waste. This ideology is a major contributing factor to one-third of landfill materials consisting of food and yard scraps. However, this material has the potential to be repurposed into renewable energy or composted to benefit further production of food. This circular food system would then continue to sustainably provide food, food access, and waste management to surrounding communities.

Another waste management system that we will examine is recycling. In contrast to the United States, Germany has one of the most comprehensive recycling programs in Europe. A large part of their success comes from strict government policies that place the responsibility of a product's recyclability on the manufacturers, in addition to high public awareness. We will examine Germany's recycling and composting system by comparing its efficiency to the American system. While both of these practices separately have the power to offset negative environmental, economic, and social impacts, the combined implementation of recycling and compost regulations in a nation can more comprehensively address and remedy these issues.

Evaluating Phenotypic Activities of Genes 5, 32, 39, and 77 from F2 Cluster Bacteriophage Avani

Kira M. Ruiz-Houston, Nader M. Abdalla

Faculty Mentor: Richard Pollenz (College of Arts and Sciences)

Bacteriophages are viruses that infect and kill bacteria. The function of approximately 70% of phage genes cannot be determined bioinformatically. Therefore, one approach to examine gene function is to express the genes in bacterial hosts, and assess whether they confer a cytotoxic or immunity phenotype. The goal of this project is to clone genes from the F2 cluster bacteriophage Avani, and assess phenotypic outcomes in *M. smegmatis*. Genes were cloned into pExTra using PCR and isothermal assembly. pExTra is an inducible expression vector. pExTra was transfected into *M. smegmatis*, and selected colonies evaluated for cytotoxicity and defense after inducing expression of the target gene. Genes 5, 32, 39 and 77 express proteins that do not have an assigned function based on analysis of all proteins in the NCBI protein database. Gene 5 expresses a 214 amino acid protein, and did not show a phenotype in either of the phenotypic assays. Gene 32 expresses a 45 amino acid protein, and did not show a phenotype in either of the phenotypic assays. However, Gene 32 may have interest because it contains a transmembrane domain. Gene 39 expresses a 78 amino acid protein and did not show a phenotype in either of the phenotypic assays. Gene 77 expresses a 48 amino acid protein and may show a partially toxic phenotype. Although these genes did not show significant phenotypes in this experiment, this data provides a framework for understanding the rest of Avani's genes, allowing an exploration of the secret lives of phages.

Hurdles in Using Bacteriophages Against Antibiotic Resistant Infections

Aksa Merin Santhosh, Quinn Pullara, Daija Robertson, Nuona Li, Gabriela Valentina Aguilar Escajadillo, Michelle Jayaraj

Faculty Mentor: Olukemi Akintewe (College of Engineering and Morsani College of Medicine)

Phage therapy is an innovative approach to combat bacterial infections using bacteriophages or viruses to integrate bacteria as therapeutic agents. The use of bacteriophages is limited in modern medicine due to the effectiveness of traditional antibiotics. Recently, the application of bacteriophages in medicine has resurged due to the rise of antibiotic resistance. Despite the promising effects of bacteriophages, the in-vivo administration can have drawbacks such as possibility of unexpected immune responses triggered by the phage. This study aimed to assess the safety and efficacy of different phage therapy trials administered in-vivo in a variety of hosts such as mice, cattle, pigs, etc. The variables analyzed in this study included the frequency and time period of administration, as well as the cure-rate or infection survival rate. Our analysis found that trials utilizing a cocktail therapy were most effective against most bacterial strains. The frequency and time length of administration of phages was dependent on the type of host and the target site. The risks associated with phage therapy were assessed to be very low and the effectiveness varied across studies. The results of this study indicate that large scale studies are needed before phage therapy can permanently be adopted as a treatment option. Overall, our findings suggest that phage therapy has the potential to be a safe and effective alternative to traditional antibiotics. Further investigation is necessary to determine the optimal treatment strategies and to establish guidelines for the use of phage therapy in clinical settings.

A Systematic Review of the Effects of the Two Major Types of Progeroid Syndromes (Hutchinson-Gilford and Werner) on the Factors of Aging Within DNA Replication

Jennifer Pam Schenk, Camren Sturgill, Praval Ghanta, Gabriel Gomez Ramirez, Hasnain Kasli, Brooke Turpin, Christian Kaplan

Faculty Mentor: Olukemi Akintewe (College of Engineering and Morsani College of Medicine)

DNA replication, broadly defined, is the process by which a cell duplicates, occurring in three primary phases. Several errors occur within this process. Various stressors can damage the cell's genome during the S-phase, a by-product of the aging process. In progeroid syndromes, however, this process varies significantly. For example, in Hutchinson-Gilford Syndrome (HGS), a mutation in the LMNA gene, which produces Lamina-A, produces effects of accelerated aging resulting in the mislocation of a protein involved in the elongation step of DNA replication. Similarly, in Werner Syndrome (WS), a mutation in the Werner (WRN) gene produces protein nullification. It negatively impacts the progression of the DNA replication fork and subsequential recovery through double-strand break (DSB) repair. Both of these progeroid syndromes, while rare, produce accelerated signs of aging on the cellular level as well as a significantly reduced life expectancy. This paper seeks to show how mutations in proteins can cause the nullification of their function or aberrant functionality, leading to further damage of the genome in progeroid syndromes (aging disorders), including HGS and WS. The method of this systematic review was done using an online database search. N=556 articles; removed duplicates, N=23 were used for qualitative synthesis. Our findings suggest that mutations in the genes that code for replisomes can code for dysfunctional proteins, which could alter the replisomes' ability to replicate the genome successfully; this causes further genomic damage. Vitamin C and D/DVR were proven to help minimize adverse symptoms of accelerated aging in HGS and WS, respectively.

Wander: A Collection of Walks in the Southwest of England

Sierra Shellabarger

Faculty Mentor: Benjamin Young (Judy Genshaft Honors College)

'Wander' is a book I wrote during my time studying abroad through the USF Honors College at the University of Exeter in Exeter, England. It is a travel guidebook composed of 19 walks and day excursions across the southwest of England, all of which are low-budget and accessible by public transportation. The book's motto is "wandering is about creating one's own paths; it is about taking the road less traveled." The goal of this research project is to encourage future USF students studying abroad in Exeter to make the most of their experience by inspiring them to explore the outdoors, get out of their comfort zone, and hopefully to engage in their own cultural research. With 'Wander,' I hope to answer the question of: "what is the essence of research, and what are some of its diverse expressions?" 'Wander' serves as an inquiry into the act of wandering as a phenomenological inquiry (aka the study of first person conscious experience), and ultimately of walking as a philosophical endeavor. This book started as a class project for Dr. Benjamin Young's Honors class also titled 'Wander,' but has evolved into a passion project of mine, providing a culminating experience to the six months I spent studying abroad.

Employee Concerns in a Multi-Campus Hospital System

Kendall Jo Ann Shirk Shirk, Amber Marie Northrup, Julianna Xochiltpill Mangum, Nicole Nagib, Kelly Nicole Drago

Faculty Mentor: Donna Lee Ettel-Gambino (Judy Genshaft Honors College)

Employee satisfaction is multifactorial in the workplace, ranging from issues with compensation to professionalism and performance. Sexual identity may play an evident role in these factors and overall job satisfaction. This study aims to examine differences among employees' sexual identity and their overall job satisfaction and concerns. The purpose was to better understand the key drivers of employee concerns within a multi-hospital system in the Midwestern United States. A causal-comparative approach was utilized. A MANOVA was conducted using SAS 9.4 (Cary, NC). The independent variable was the employee's reported sexual identity. The dependent variables included employee's reported concerns as it relates to issues with 1) Family Medical Leave Act (FMLA) and/or Leave of Absence (LOA); 2) Paid Time Off (PTO); 3) unemployment benefits; 4) attendance; 5) compensation; 6) professionalism; 7) COVID-19 and 8) performance. This study identified two statistically significant findings: (1) employees (13%) who reported having issues with 'unemployment benefits' ($p < 0.01$); and (2) employees (22%) who reported having concerns regarding 'performance' ($p < 0.01$). The findings showed that employees who identified themselves as female (19%) were more likely than male employees (6%) to report issues regarding 'unemployment benefits'. In contrast, male employees (29%) were more likely to voice concerns surrounding the 'performance' criterion as opposed to female employees (14%). This study highlights the importance of healthcare sector employers considering employee sexual identity in reported job-related issues. This may provide an insight into where improvements should be directed in order to maximize collaboration between staff and leadership and improve quality of care.

Characterizing Emergency Department Use and Misuse at the James A. Haley Veterans' Hospital

Shahid Siddique, Sricharan Pusala

Faculty Mentor: Fabio Leonelli (Morsani College of Medicine)

Emergency department (ED) misuse at Veterans' Affairs (VA) hospitals is a subject that is not well understood. Characterizing ED use and misuse in the veteran population can reveal systems-level successes/shortcomings that can inform future health policies regarding patient management. This study aimed to characterize the patient profiles of veterans seeking care at the James A. Haley Veterans' Hospital (JAHVH) ED and their respective spatiotemporal relationships to primary care centers during the 2022 fiscal year. The Emergency Severity Index (ESI)—an algorithm used to quantify the acuity and resources needed by a patient—helped define the term "misuse" as an ED visit ranked as ESI 4 or 5 with no record of a performed procedure during the encounter. Visits that did not include any procedure conducted by the ED are likely concerns that could be manageable by the patient's primary care provider (PCP). Mapping the complex spatiotemporal relationships between PCP and patient via ArcGIS Pro can identify barriers to the ideal flow of care. Encounters at the JAHVH ED were collected using the VA's Data Access Service. The visits were then classified as "appropriate use", or "misuse" based on the previous definition. Analysis of the two cohorts identified the clinical and demographic characteristics of both groups including the age, gender, the time of the visit, the patient's address, ICD-10 code associated with the visit, mode of arrival, Differential cost at ED/PCP, and spatiotemporal PCP-Patient relationships. This characterization can inform future policies that further investigate and remedy ED misuse at VA hospitals.

Relationships of Monetary and Affective Valuations of Experiences

Clayton Spencer, Tatyana Butler, Zoe Ritchotte, Brittnee Hampton

Faculty Mentor: Sandra L. Schneider (College of Arts and Sciences)

We explored how affective feelings are related to willingness to pay to experience positive or avoid negative events (e.g., going to the beach, getting arrested). Participants were randomly assigned to positive or negative conditions in this online experiment involving 8 scenarios presented once at shorter and once at longer time durations. Participants reported their willingness to pay to engage in or avoid the experience, and they rated how happy or upset they would feel about spending time in that experience. Results show how levels of affective responses to experiences are related to monetary valuations of those experiences, as well as how values for shorter experiences are related to values for longer experiences. The results call attention to how evaluations of experiences differ depending on the measures used.

Does the Freshness at the Time of Collection Affect the DNA Recovery from Anoa Fecal Samples?

Jasmine Tabares

Faculty Mentor: Michelle Green (College of Arts and Sciences)

The *Bubalus depressicornis*, otherwise known as the lowland anoa, are an endemic mammal to Sulawesi, Indonesia and are listed by the IUCN as an endangered species. There are many threats that are contributing to the future extinction of the anoa, the main one being human impact. Conservation efforts have been taking place in order to attempt possible restoration of the species. Investigation of genetic diversity using molecular approaches such as microsatellites markers have been used to determine the low genetic diversity in the lowland anoa. Genetic diversity is important in populations as it encourages the survival of a species, however, it can be lost as the population decreases. Traditional sampling includes blood or tissue which could negatively impact this vulnerable species. Therefore, noninvasive genetic assessment through fecal analysis is a viable option. Non-invasive genetic assessments provide highly effective results without the need to capture or harm the species. DNA quality can be affected by several things including the freshness of the sample when collected. This study compares the recovery of DNA from fecal samples of varying freshness at time of collection. We hope to provide information to conservationists in Indonesia to apply in the wild and save the lowland anoa with these findings.

Eye Tracking of Fixations Towards Parenting Behaviors

Amy R Texter, Norma R. Reyes, Wendy M. Rote, Max Owens

Faculty Mentor: Wendy M. Rote (College of Arts and Sciences)

Research has consistently shown a link between internalizing symptoms and negative attention biases (Platt et al., 2015). For instance, eye-tracking studies have revealed that individuals with depression tend to display a gaze pattern in which they overlook positive stimuli while fixating longer on negative stimuli (Armstrong and Olatunji, 2012). Additionally, negative attention biases may affect how adolescents perceive parenting behaviors. Controlling for parents' and observers' perceptions of parenting behaviors, youth with greater internalizing symptoms report more parental shame- and guilt-induction during parent-child interaction tasks (Rote et al., 2021). Despite these findings, little research has investigated whether depressed youth

specifically attend more to shame- and guilt-inductive aspects of parenting statements. Therefore, we employed eye-tracking technology to investigate associations between depressive symptoms and visual fixations towards written phrases containing negative affect, attacks on the self, or highlighting one's self-efficacy. Eighty college students ($M_{age} = 25.32$, $SD = 6.39$, 76.3% female), completed an eye-tracking task in which they read vignettes involving parental shame- or guilt-induction, followed by a survey measuring their depressive symptoms (BDI; Beck et al., 1996). Our results reveal a negative correlation between levels of depression and fixation on phrases attacking the self. Other correlations did not achieve statistical significance. This finding contrasts with the initial hypothesis and can provide insights for future research. Specifically, further investigation is needed to understand why parental behaviors do not become a fixation for those with internalizing issues as the negative attention bias would predict.

A Tale of Two Age Groups: Patient Satisfaction Across Age Cohorts

Anish Reddy Thalakola, Adnan Rahman, Bilal Nadeem, Nicole Nagib, Kelly Nicole Drago

Faculty Mentor: Donna Lee Ettl-Gambino (Judy Genshaft Honors College)

Effective patient-centered care requires efficient practices, strong communication, and proper systems. Age is a major factor that can impact patient satisfaction. Healthcare providers should be aware of this factor and adapt care accordingly. The purpose of this study was to explore how patient age influences their satisfaction within a multi-hospital system in the midwestern United States. A MANOVA was conducted to identify significant trends. After rejecting the null hypothesis, one way ANOVA contrasts were conducted for each criterion. The independent variable was the patients' age group (over 65 and between 18 and 65). The dependent variables were the patient's reported overall agreement with the following criteria: 1) timeliness; 2) communication; 3) care-team; 4) provider; 5) systems; and 6) facility. There were statistically significant findings as evidenced by Wilks' Λ ($F(6, 143) = 0.91$, $p < 0.05$). There were six statistically significant findings: 1) patients (87%) who reported satisfaction with timeliness ($p < 0.01$); 2) patients (85%) who reported satisfaction with communication ($p < 0.01$); 3) patients (84%) who reported satisfaction with the care team ($p < 0.05$); 4) patients (89%) who reported satisfaction with their provider ($p < 0.05$); 5) patients (79%) who reported satisfaction with the system ($p < 0.05$); and 6) patients (84%) who reported satisfaction with the facility ($p < 0.05$). For every criterion, patients over the age of 65 reported higher satisfaction. These data imply that older patients are more likely to be satisfied with general determinants of hospital function. The recommendations of the findings are for greater research on the working class and the determinants they care about most.

Transportation for Veterans

Nathan Tout-Puissant, Nevaeh Coleman, Steven Brown, Andrew Allen

Faculty Judithanne Scourfield-McLauchlan (College of Arts and Sciences)

We want to give veterans free transportation to the VA to provide them with the rights they deserve.

The Search for Health: College Students and their Internet Use

Delaney Erin Turner, Carolina Andrea Arce Castro, Manuela Jaramillo, Nicole Nagib, Kelly Nicole Drago

Faculty Mentor: Donna Lee Ettl-Gambino (Judy Genshaft Honors College)

Prior research suggests that online health searches may affect medical decision making and health-seeking behaviors. Internet searches may then serve as tools to identify health-seeking behavior and potentially identify risk factors. Therefore, it is imperative that biological and social determinants of health-seeking behavior are understood. Our objective was to improve the understanding on how college students utilize electronic tools to obtain health information and what topics searched were prioritized. A MANOVA was conducted to identify significant trends amongst a sample size of 292 Eckerd College students. The independent variable was the biological sex of the student. The dependent variables examined were students' responses to survey questions about if they use the internet to access health information, specifically if they inquired about weight control, skin conditions, sexual health, or potential medicinal side effects. The result of this study shows that females were significantly more likely to frequent the internet than their male counterparts. Female students were also more likely to query information on weight control and about skin conditions than male students. Evidence shows that the internet serves as a primary source of information for health-related issues among college students. It provides gateways to a plethora of information about effective and preventative services and healthcare. Finding online information does not ensure college students will practice healthy habits. Considering women are more likely to conduct internet searches, student health services leaders may want to tailor educational programs towards male and female students on their campus to ensure their healthcare needs are met.

Resolved or Unsolved: Health Care Worker Concerns Across Hospital Campuses

Catherine Elizabeth Susanna Wall, Alexis Marie Gordillo, Veronica Ibrahim Ramzy Daoud, Nicole Nagib, Kelly Nicole Drago

Faculty Mentor: Donna Lee Ettl-Gambino (Judy Genshaft Honors College)

It is imperative that hospital administrators maintain a positive environment for their health care professionals, as how they respond to their concerns is often unsatisfactory and can make it difficult for health care employees to maximize the patient care experience. The purpose of this study was to identify health care workers' reported concerns within a multi-hospital system in the Midwestern United States. A MANOVA was conducted to identify significant trends across groups. The independent variable was employees assigned hospital location. The dependent variables were the employee's categorized concerns: 1) issues with attendance; 2) compensation; 3) issues with unemployment benefits; 4) issues with professionalism; 5) Leave of absence (LOA); 6) resolution of issue; 7) agreement that concerns were investigated; and 8) issues with termination. Descriptive statistics including visual displays and summary statistics to include the means, standard deviations, skewness, and kurtosis were calculated. There were statistically significant findings as evidenced by Wilks' $\Lambda(64, 537.13) = 0.29, p < 0.05$. After rejecting the null hypothesis univariate analysis of variance (ANOVA) contrasts were conducted on each of the eight criterion. The significant findings were: 1) employees (12%) who reported having issues with unemployment benefits ($p < 0.0005$); 2) employees (88%) who reported that management resolved their concerns ($p < 0.0001$); and 3) employees (12%) who reported that their concerns were not resolved to their satisfaction ($p < 0.00006$). This information may assist health care workers and campus department heads in the Midwest—and nationally—in identifying, designing, and implementing strategies to improve health care workers' experiences in the workplace and to handle concerns effectively to avoid the effect of unemployment in the United States. The concerns are becoming less of a priority and have a dramatic impact on healthcare workers' satisfaction.

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