Undergraduate Research Conference

USF 2022 Undergraduate Research Conference

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Conference Award Ceremony*

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2022 ANNUAL UNDERGRADUATE RESEARCH CONFERENCE

UNIVERSITY OF SOUTH FLORIDA
Dear USF Students, Colleagues, and Guests,

Welcome to the 2022 OneUSF Undergraduate Research Conference! We are delighted to see continued interest from undergraduate students and their faculty mentors in engaging in research. Known to be a high-impact practice, undergraduate research affords students the chance to create new knowledge in fields they hope to work in someday, generating not only an exciting learning opportunity, but indeed making a real difference in people’s lives and the health of our planet. We hope you are as impressed with these 132 projects as we are!

GO BULLS!

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

CONFERENCE ORGANIZING COMMITTEE

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ACKNOWLEDGMENTS

The Undergraduate Research Conference Organizing Committee would like to acknowledge all the individuals who contributed to mentoring our USF undergraduate scholars. We recognize the desire students have for participating in research and, thanks to you, more students are making unique contributions to their disciplines. We would also like to thank Undergraduate Studies and all of the USF Departments that have collaborated with the office of High Impact Practices and Undergraduate Research to make the 2022 OneUSF Undergraduate Research Conference a huge success! The Office of High-Impact Practices & Undergraduate Research would like to give a very special “thank you” to Nicholas Barnes, Lan Renee Amboy Biller, Mark Hines-Cobb, and Dr. Chantae Still for their many contributions to the 2022 Undergraduate Research Conference. This event would not have happened without their efforts.
Dear Students and Colleagues,

On behalf of the University of South Florida, it is my pleasure to welcome you to USF’s annual Undergraduate Research Conference. Each year the University of South Florida forward in both international and national rankings, including top 50 positions in U.S. News & World Report National University Rankings, Times Higher Education World University Rankings, and Academic Ranking of World Universities (ARWU). These university accomplishments are a result of the research and scholarship, to which students are essential contributors, focusing on addressing pervasive problems, and generating and disseminating knowledge.

Our student researchers are at the center of our work to build a better tomorrow. This conference promotes and showcases educational opportunities that help students build the skills they need to be successful, both in the workplace, and as engaged global citizens.

I could not be more impressed by our students and their faculty mentors, who have risen to the occasion of performing and presenting their work throughout these extraordinary times. For their passion for high-level scholarly work, their problem-solving expertise, and their determination to engage in the spirit of collaboration and discovery, I extend my congratulations to our talented students and their teams.

I’d like to offer my gratitude to the Office of Undergraduate Research for organizing and facilitating this meaningful opportunity for students to present their research projects. I also want to take a moment to recognize our faculty mentors. Your collaboration and guidance are a testament to the USF mission — providing access for student success and unwavering pursuit of excellence for the betterment of our students, research, and the communities we serve.

Finally, I wish to thank our many faculty volunteers and staff who moderate these conference sessions. Your service reinforces both the rigorous, knowledge-making drive of our world-class institution, as well as our commitment to the spirit of collaboration and collegiality. Thank you to our students and faculty for bringing out the best our university has to offer.

Dr. Ralph C. Wilcox
Provost and Executive Vice President

Access all conference materials online here: digitalcommons.usf.edu/usf_ourconference/2022
An Anatomy of Victim Blaming Women
Mohammad Zareef Akhand
Faculty Mentor: Ulluminair Salim (Judy Genshaft Honors College)

It is common to find objectionable phrases run rampant in the wake of sexual assault. From the uncharitable ‘It’s not really rape’ to the graceless ‘She asked for it,’ these egregious justifications represent an omnipresent epidemic: victim-blaming. This paper looks at the underlying factors that trigger this mentality. Contrary to superficial notions, sexual assault encompasses intricate attributes that elicit varying sentiments from people. This ranges from the victim’s disposition and the Just World Belief to substance abuse and Rape Myth Acceptance (RMA). In the context of sexual assault, women victims are methodically parted into two types: submissive and feminist (Capezza and Arriaga). The latter category is often career-oriented and independent, which does not conform to stereotypical gender roles. By virtue of this, they evoke less empathy, often castigated for ‘asking for it.’ In this regard, people follow the Just World Belief, a pernicious principle that leads bystanders to hold victims accountable because they are not observing ‘ethical conduct’. These intertwine into the extenuating RMA. From negating victims’ claims to acquitting perpetrators, RMA occurs as men are traditionally expected to initiate, which disregards a ‘no.’ Moreover, substance abuse could incite ambiguous signals. These are stretched and twisted into willingness that is cited to hold victims culpable (Grubb and Turner). This paper will expound each of these concepts with invocations of experiments that legitimize and buttress them. In doing so, I hope to amplify the distortedness of this practice by exploring its foundation, thereby motivating society to examine and revamp our culture.

Fostering Emotional Intelligence in Early Childhood Education
Isabella Alicea
Faculty Mentor: Jolyn Blank (College of Education, Curriculum, Instruction and Learning)

Emotional intelligence refers to a set of skills related to monitoring one’s own emotions. Previous research has shown that children with higher emotional intelligence are more engaged in school, better able to pay attention, and have more positive relationships with peers and teachers. Studies show that when teachers intentionally support students’ social and emotional learning, it can help improve students’ well-being; however, not every teacher implements strategies that can help to regulate students’ emotions. The purpose of this study is to describe how explicit instruction helps students explain their emotions and increase positive interactions. This study was conducted in a first-grade classroom. Data sources include anecdotal records developed from observation of students during the reading block, behavior calendars, weekly progress reports, and recordings of students practicing these strategies to illustrate how they evolve over time. I expect to find that the students will be able to engage more successfully in learning. Explicitly fostering students’ emotional intelligence benefits students not only in first grade but in the rest of their lives while they continue to grow and are exposed to different types of social situations.
The Hidden Stars of Palestine: How Disabled Women are Obscured from Middle Eastern Culture
Sophia Alonso, Maura Lynch, Kaelyn Mills, Amber Northrup
Faculty Mentor: Lindy Davidson (Judy Genshaft Honors College)

The disparity between disabled men and women in the Middle East has become increasingly prevalent. The religious and cultural practices of this region influence the classification of disability. Governmental and cultural frameworks work to enable discrimination towards women with disabilities. This study examines how the Stars of Palestine organization contributes to providing assistance to women with disabilities. We have conducted a literature review of current studies, documentaries, and texts that pertain to disability in the Middle East, with a focus on the Gaza Strip and West Bank Region. While Palestinian law forbids discrimination based on disability, it is unclear how much this pertains to women and their role in society. For the purpose of this review, disability will be examined through the lens of gender and culture. We investigated the extent to which Stars of Palestine succeeds in empowering and promoting the visibility and inclusion of disabled people. Findings suggest that women with disabilities in Palestine are not accounted for in their governments’ emergency plans and aid packages. These women experience loss of bodily autonomy through marriage and the cultural prevention of religious freedom. Through a lack of support from their country and their culture, women are subject to a limited social status and feelings of insufficiency. Prominent gender inequalities and the evident lack of aid for disabled women in these regions supports the notion that further action should be taken to ensure equity for the women of this region.

The Major Problem: The Impact of College Major on COVID Precautions
Seara Anderson, Bryan Cao, Natalie Nagib, Juliana Catherina Rendle
Faculty Mentor: Donna Lee Ettel-Gambino (Judy Genshaft Honors College)

Recent literature indicates that certain demographical traits including major may impact a person’s willingness to comply with COVID-19 safety protocols. The purpose of this study is to examine if there are differences among COVID-19 related behaviors between STEM (Science, Technology, Engineering and Math) majors and non-STEM majors. In conducting this study, a causal comparative approach was utilized. A MANOVA was conducted utilizing SAS 9.4 (Cary, NC). The independent variable was STEM Major status. The dependent variables were: 1) student vaccination status; 2) concern with omicron variant; 3) trust in CDC guidelines and information on the platform; 4) compliance with indoor mask wearing; and 5) compliance with social distancing. This study resulted in two statistically significant findings: 1) the proportion of students (88%), who report being vaccinated (p < 0.009); 2) the proportion of students (93%) who comply with indoor mask wearing (p < 0.001). These results suggest that major may influence a person’s behavior regarding COVID-19. One’s status as a STEM major may influence their likelihood to wear a mask and their compliance with immunization. One application of this information could be encouraging institutions to provide students with more information about the benefits of taking precautions against COVID-19. Additional information about the virus may motivate more students to take the necessary precautions against COVID-19. Being a STEM major implies that one would have a wider array of knowledge concerning scientific topics, and it is possible that this affected the way in which they reacted and continue to behave regarding COVID-19.
Exploring Carbon Quantum Dots (CQD) Nanoparticles in Treating Ocular Diseases
Kirollos Armosh, Manas R. Biswal
Faculty Mentor: Manas Biswal (Taneja College of Pharmacy, Pharmaceutical Sciences)

As global projections of individuals who will suffer from vision impairments accumulate to approximately 1.76 billion by 2050, a pressing need to expand therapy for ocular diseases is evident. Ocular diseases alter the proper function of the eye, deteriorating both the vision and quality of life of affected individuals. Drug delivery via nanotechnology has provided promising outcomes through innovative engineering and rapid technological advancements. Our goal is to investigate the current use of carbon quantum dot nanoparticles for treating retinal diseases. Upon researching published research articles, we found that nanoparticles are meticulously engineered particles ranging from 1 - 100 nm that function as drug delivery vehicles. Organic Nanoparticles, such as those used to deliver acyclovir (ACV), are designed with lipids, carbohydrates, and proteins to regulate drug release. The ability of organic nanoparticles to limit toxicity allows it to be a potential therapeutic for age-related macular degeneration (AMD). Inorganic nanoparticles are composed of metals and quantum dots to alter a drug’s adverse side effects with stability, promoting the drug’s biodistribution within the retinal layers. However, the metallic composition of inorganic nanoparticles raises toxicity concerns. Thus, there is a need for an organic alternative to ensure safe administration. One fascinating nanoparticle design is the carbon quantum dot nanoparticle (CQD), with outstanding biocompatibility and fluorescence to allow ocular imaging, low-cost synthesis, and eco-friendly properties. Although the FDA has approved some intravitreal injections of nanoparticles, CQDs face many challenges, such as their relatively new introduction to clinical use compared to conventional drug delivery mechanisms. Therefore, our research aims to investigate the potential use of CQDs to treat retinal degenerative diseases through cell viability and pre-clinical animal trials.

Gender Differences in COVID-19 Comprehension and Compliance in Students at the University of South Florida
Sana Saeedah Baban, Alyssa Mae Perez Ulgasan, Juliana Catherina, Natalie Nagib
Faculty Mentor: Donna Lee Ettel-Gambino (Judy Genshaft Honors College)

Literature suggests that females present higher perceptions of danger to COVID-19, while males present higher values of extraversion. No significance was detected in differences of how the pandemic has affected personal life within the context of gender. In this study, attitudes and behaviors of university students towards the latest wave of the COVID-19 Omicron variant were analyzed according to gender. A casual comparative approach was utilized. A multi-variance analysis of variance was conducted using SAS 9.4 (Cary, NC). The independent variable was identified gender. The dependent variables include (1) changes in mental health (2) agreement with CDC guidelines (3) knowledge of someone who died from COVID-19 (4) willingness to share symptoms (5) willingness to isolate if COVID-positive (6) worry about the Omicron variant (7) belief of vaccine effectiveness against the Omicron variant (8) change in behavior according to online information regarding COVID-19. There were four statistically significant findings: proportion of (1) students (26%) who experienced changes in their mental health (p<0.0002) (2) students (13%) who would share if they were experiencing COVID symptoms (p<0.0405) (3) students (68%) who would isolate if COVID-positive (p<0.0001) (4) students (72%) worry about the Omicron variant (p<0.0035). The evidence implies that females are more likely to report a more negative change in mental health, share positive testing status, are more willing to isolate after a positive COVID-19 test and endorse higher rates of concern regarding the Omicron variant. These results suggest a correlation between gender identification and COVID-19 behavior compliance, risk perception, and mental health.
Meta-analysis Investigating the Correlations Between Gut Microbiota Characteristics and Mental Health Illnesses and the Potential Of Dietary Modifications to Modulate.

Shrinit Babel
Faculty Mentor: Alene Wright (Morsani College of Medicine, Family Medicine)

The prevalence of any mental illness (AMI) among younger populations has substantially increased, with most studies pointing to psychosocial factors. Yet, less research has been done in uncovering the relationships between diet, gut microbiome health, and mental health disorders. Recently, reports of gut dysbiosis and microbiome perturbations are more frequent in patients with mood disorders, neurodevelopmental disorders, psychotic disorders, and anxiety disorders when compared with the general population. Here, this meta-analysis aimed to identify biomarkers of the gut microbiome attributed to the above mentioned classes of mental health illnesses and evaluate the potential of dietary modifications to modulate. Human case-control studies with participants between ages 5-39 investigating human microbial characteristics associated with various psychiatric disorders mentioned in the Diagnostic Statistical Manual of Mental Disorders V (DSM-V) were searched using PubMed, Web of Science, PsychINFO, ProQuest, Disbiome, and gutMDisorder databases. Statistically significant changes in the relative abundances, species diversity, species richness, short-chain fatty acid (SCFA) markers, and other relevant parameters were tabulated per phenotype. For the second part, studies were identified and selected using the above databases that correlate dietary aspects to the immunonutrition of the gut flora. The information obtained can help improve our understanding of connecting dietary modifications to serve as a potential preventative or therapeutic measure to mental health disorders.

Novel L-Ergothioneine Treatments with Antioxidant/Anti Inflammatory Effects Improve Hearing in Geriatric Male Mice in CBA/CaJ Mice

Nidhi Bangalore, Lina Elessawey, Mark A. Bauer, Alejandro A. Acosta, Mark Thivierge, Moksheta Chellani, Robert D. Frisina
Faculty Mentor: Robert Frisina (College of Engineering and Morsani College of Medicine, Medical Engineering)

Presbycusis, also known as age-related hearing loss, is gradual hearing loss that occurs as people grow older. There are many causes of age-related hearing loss, but one cause includes cochlear oxidative stress. Free radicals of oxygen or reactive oxygen species accumulate in the ear as a byproduct of many biochemical pathways. The buildup of byproducts causes oxidative stress on the cochlea, resulting in damages. Antioxidants are substances that neutralize the free radicals that cause oxidative stress. L-Ergothioneine is a naturally derived antioxidant and shows therapeutic potential in many health issues regarding oxidative stress, including Alzheimer's disease, liver damage, and heart disease. A study was designed to determine if the naturally derived anti-inflammatory antioxidant L-ergothioneine can be used to prevent presbycusis. The male and female CBA/Caj mice were divided into three groups for testing: control, low-dose (35mg/kg), and high-dose (70mg/kg). Hearing tests using ABRs were performed on a monthly basis over six months after the initial baseline measurement. The data was then analyzed by determining the threshold at each frequency and the intensity of wave I that reflects the response of the cochlear nerve. After baseline testing, males’ hearing improved in ways that varied by dosage, whereas females’ hearing did not improve and may have worsened. This suggests that EGT may have a future as an ARHL progression treatment derived from nature.
Supporting English-Language Learners During Language Arts Instruction
Q’Ristien Berrian
Faculty Mentor: Jolyn Blank (College of Education, Curriculum, Instruction and Learning)

Nearly half of the students in my first-grade classroom are dual-language learners in various stages of English language acquisition. Previous research recommended that teachers of young children cultivate bilingualism; however, many early childhood educators find it challenging to provide effective instruction for English language learners (ELLs) while also meeting grade level English Language Arts (ELA) standards. The purpose of this study is to gain understanding of ways teachers support dual-language learners in the ELA domain. I employed research-based strategies to support language learning in small group instruction in order to describe the students’ responses to instruction. Data sources were audio/video recordings of small group instruction, student assessments, and student work samples. I expect to find variance in the student’s responses to my teaching strategies, and to demonstrate how I modified instruction in relation to students’ responses. Understanding this variance is important in terms of increasing the quality of instruction for dual-language learners in early childhood education classrooms.

Exploring Multiple Ways to Assess Young Children’s Learning
Autumn Brooke Bluhm
Faculty Mentor: Jolyn Blank (College of Education, Curriculum, Instruction and Learning)

Observing, documenting, and assessing children’s learning are essential processes teachers employ to plan effective instruction. According to the National Association for the Education of Young Children, teachers should utilize multiple forms of assessments strategically, in ongoing reflective and purposeful ways. The purpose of this study is to explore the multiple ways various assessments provide insights into what students know and can do. This study was conducted in a second-grade classroom that utilizes iReady, a tool that helps teachers plan instruction, set goals, and assess student progress based on results from individualized instruction assessments along with supports that learners need. In addition to examining iReady assessment, I utilized authentic assessments such as performance assessment and observation in the context of classroom activities. Data sources included students’ work samples, anecdotal records developed from classroom observations, and audio/video recordings. I expect to illustrate the ways using multiple forms of assessment tools provides a clearer picture of student’s capabilities. Better understanding of how to use a variety of assessment tools is critical for effective teaching.

Developing a Digital Library of Geologic Samples to Improve Accessibility to Learning Experience
Jacob Booe, John Clarke, Matthew Eisenson, Erica Francher, Aulias Horton, Ivan Nava Hurtado, Maraley Santos, Charlie Smith
Faculty Mentor: Aurelie Germa (College of Arts and Sciences, Geosciences)

During the global impacts of COVID-19 pandemic, students were unable to participate to in-person labs and missed learning important hands-on skills. The USF-School of Geosciences Volcanology Lab proposes to acquire a large collection of high-resolution images from a variety of geologic samples (minerals and rocks) that will be used to generate 2D and 3D digital models for students to investigate remotely. To remedy the availability for all students the goals of this collection are as follows. First,
undergraduate students will use a 4K digital microscope (Keyence VHX-7000) to image mineral and rock samples in hand specimen and thin sections. Images will then be used to create 3D models (via Sketchfab.com) that will be part of an accessible digital sample library. Second, we plan to use a drone to also make 3D models of geologic outcrops. Third, a searchable database using Google Sheets will be developed, with URL links to the digital models, as well as detailed information on the sample (geographic location, type of material, size, chemical composition, and other geological data). Several types of data at different scales will be provided: megascopic (field, outcrop), macroscopic (rock, hand specimen), microscopic (grains, thin sections), plus geochemical and geochronological data. Models can be displayed on computers as well as smartphones. Finally, images can also be processed to analyze for number and size of components to better quantify geologic processes as part of educational and research projects.

How Qualitative Research Can Give People a Voice

Jayda Bostic & Luis Jimenez
Faculty Mentor: Ruby Joseph (College of Behavioral and Community Sciences, Child and Family Studies)

Qualitative research plays a crucial role in generating theory. Qualitative research can provide depth and validity, capture human nuance, and describe the state of social affairs. As research assistants on: A Strength-Based Approach to Addressing Racial Challenges Impacting Black Students, we have discovered how science can improve people's lives. This study utilizes focus groups to give people a voice, make them feel heard, and be a part of reform that would benefit them. We have conducted a preliminary analysis of demographic data to give a snapshot of the people behind the science. Finally, we reflect on our experience of being researchers and its importance, to us and society.

The Norm Activation Model (NAM) and Florida Residential Electricity Consumers’ Adoption or Rejection of Photovoltaic (PV) Rooftop Solar Power Technology

Jason Bowman
Faculty Mentor: Brian Turnbull (College of Arts and Sciences, Sociology)

This research project investigates the major factors motivating Florida residential electricity consumers to adopt or reject photovoltaic (PV) rooftop solar power technology using the norm activation model (NAM). In the context of sustainable electricity consumption, the NAM posits that an individual is more likely to adopt or implement renewable electricity technology when an individual has a strong personal norm to act in an environmentally sustainable fashion. The two major factors that affect personal norms are awareness of consequences and outcome efficacy beliefs. Data to test the NAM’s predictive power was collected by creating two survey questionnaires, one for PV rooftop solar power adopters and the other for PV rooftop solar power non-adopters. The two survey questionnaires were disseminated to approximately 27,000 Floridians contained in Solar United Neighbors of Florida’s email database. Descriptive statistics were generated for both populations of respondents and chi-squared analysis was performed on three key variables between the two populations in order to test the predictive power of the NAM. The three key variables examined were Florida residential electricity consumers' level of environmental awareness, outcome efficacy beliefs, and personal norms. No statistically significant differences were found between the two populations sampled regarding the level of environmental awareness, outcome efficacy beliefs, or personal norms. Further research is required to ascertain the predictive power of the NAM on whether Floridians are more likely to adopt or reject PV rooftop solar power based upon a strong personal norm to act in an environmentally sustainable fashion.
Copolymerization with Cationic Monomers Enhances Cell Adhesion on Patterned “Smart” Hydrogels
Alexandria Brady-Mine, Dr. Nathan Gallant
Faculty Mentor: Nathan Gallant (College of Engineering, Mechanical Engineering)

Controlling cell adhesion to smart materials is essential for advancements in medical devices and tissue engineering. The poly(N-isopropylacrylamide) (PNIPAAm) polymer is a “smart” thermoresponsive polymer with extensive applications in new medical technologies. Cells can survive the polymer’s 32°C volume phase transition. Our group is using this property to 3D print tissues and develop a cell culture dish using mechanical forces instead of chemicals to release cells, resulting in a higher cell yield. Cell adhesion to the PNIPAAm gels is poor due to minimal protein adsorption. Based on the observation that coating surfaces with polylysine enhanced cell adhesion on PNIPAAm gels, we tested the hypothesis that incorporating APMA (cationic lysine-like monomers) into the PNIPAAm polymer network would enhance cell adhesion on patterned and uniform polymer surfaces and that this enhancement is tunable based on the concentration of APMA. A series of cross-linkable PNIPAAm polymers incorporating 0-5% APMA was synthesized. NIH3T3 cells were adhered to glass coverslips coated with the crosslinked PNIPAAm polymer films. The adhesion strength of cells was quantified using a spinning disk device which provides a well-defined, radially varying range of hydrodynamic forces. The uniform 1% and 5% films showed 2.7-fold and 10-fold increases, respectively over the 0% uniform samples. The patterned 1% and 5% films showed 3.6-fold and 36-fold increases, respectively over the 0% patterned samples. The 0%, 1%, and 5% patterned polymer slips showed 3.7-, 4.8-, and 14-fold increases, respectively, in cell adhesion strength relative to their uniform counterparts.

Neural Correlates of Signal-in-Noise Processing Improve Following Treatment with a Targeted Augmented Acoustic Environment: A Behavioral and Physiological Approach
Dimitri Brunelle
Faculty Mentor: Joseph Walton (College of Behavioral and Community Sciences, Communication Sciences and Disorders)

A deficit in the ability to understand speech in noisy environments is a notable facet of age-related hearing loss (ARHL) and other auditory disorders stemming from declines in function of the auditory nervous systems. In addition, signal-in-noise (SiN) detection is a problem in acquired hearing loss and aging. We hypothesized that an augmented acoustic environment (AAE) comprised of tone bursts embedded in background noise of various levels will improve neural coding of sounds in noise via neural plasticity. To test the effect of this novel SiN-AAE, old mice were exposed over a 2-month period and then behavioral and physiological responses to a novel signal-in-noise stimuli were compared to those of an unexposed control group of similar ages. CBA/CaJ mice, aged 21-22 months, were exposed to SiN-AAE for 12 hours per day, for 2 months. Control mice were not exposed to SiN-AAE. The SiN-AAE simulated real-world listening in a noisy environment and consisted of a continuous Gaussian background noise at 50 and 65 dB SPL. 50 ms 16 kHz tone bursts were presented every 200 ms, at intensities of +3, +6, +9, and +12 dB SPL above the background. We assessed SiN detection behaviorally utilizing pre-pulse inhibition of the acoustic startle reflex, and physiologically utilizing extra-cellular electrophysiology recordings in the inferior colliculus. Exposure to SiN-AAE resulted in a frequency-generalizable behavioral SiN processing improvement. Additionally, SiN-AAE exposure resulted in improved SiN response characteristics in the inferior colliculus. Long-term exposure of this novel SiN-AAE improved encoding of tones-in-noise in aged mice.
Gen Zs in a Generation of COVID: Political Affiliation and Pandemic Attitudes Among University of South Florida Students
Bryan Cao, Seara Anderson, Juliana Rendle, Natalie Nagib
Faculty Mentor: Donna Lee Ettel-Gambino (Judy Genshaft Honors College)

Previous research found that individuals in the United States with a conservative political affiliation are more likely to distrust COVID-19 information and not comply with public health precautions. This study aims to investigate the relationship between political affiliations and attitudes across students at the University of South Florida. A causal comparative approach was utilized. A MANOVA was conducted utilizing SAS 9.4 (Cary, NC). The independent variable was political affiliation, which was separated into the following categories: conservative, moderate, liberal, or other. The dependent variables were as follows: 1) whether or not the student was vaccinated; 2) whether or not they believed omicron was a threat; 3) whether or not they trusted the CDC; 4) whether or not they masked indoors; 5) whether or not they practiced social distancing. This study resulted in significant findings across every dependent variable. 88% of students were vaccinated, 71% believed omicron to be a threat, 79% trusted the CDC, 93% wore a mask indoors, and 60% practiced social distancing. For all dependent variables, p<0.01, with variables 1-4 having p<0.001. Students that identified as liberal were more likely to be vaccinated, believe that omicron was a threat, trust the CDC, mask indoors, and practice social distancing than students that identified as conservative. Findings of this study suggest that the political affiliation of university students may affect their attitude towards the pandemic. For future work, this study may be combined with studies of other demographics to better plan public health policies specially catered to the student population.

Measurement of Skin-Suit Interaction During EVA
Valeria Carrasquillo, Niraliben Patel, Dr. Stephanie Carey
Faculty Mentor: Stephanie Carey (College of Engineering, Mechanical Engineering)

The extravehicular mobility unit (EMU) is used to create a breathable environment for astronauts to perform extravehicular activities (EVA). However, the suits used to protect the human body from the space environment interfere with mobility and cause increased discomfort to the point that they can result in injury to the astronaut. Information on the movement on the human body in an EMU is limited therefore the preventative measures to avoid injury in an EMU are also limited. The proposed solution is a sleeve that determines the amount of pressure applied at a certain point of the arm. The data are recorded in real time using Arduino Nano 33 BLE and arrays of force-sensing resistors and force-sensing linear potentiometers. The sensors attached to the suit can easily be moved around to have the sensors placed in the same places in varying size users. Placement of the sensors are based on a database of common areas of discomfort and injury. The sleeve is made with a Lycra fabric that is elastic allowing minimal restrictions and for people of different sizes to use the same sleeve.

A Tragedy of Errors: The United States and the 1964 Election in British Guiana
Kacy Cartmell
Faculty Mentor: Arturo Jimenez-Bacardi (College of Arts and Sciences, Interdisciplinary Global Studies)

There is a growing political science literature focusing on the use of covert action by great powers in order to intervene in the domestic affairs of other states (O’Rourke 2018; Levin 2020; Poznansky 2020). Most of this literature focuses on why states choose covert action over other foreign policy tools (Carson 2020; O’Rourke 2018; Poznansky 2020) and whether the overall
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Covert campaign met the goals of the intervening party (O'Rourke 2018; Levin 2020). Building on this literature and analyzing more than 300 recently declassified U.S. and British documents, this paper will focus on a little known joint U.S.-U.K. covert regime change operation: the British Guiana elections of 1964 that removed Cheddi Jagan from power. This paper will show U.S. and British motivations in this affair and illustrate the various covert tools utilized in this campaign. Furthermore, the paper will clarify some of the debates surrounding the most controversial parts of this covert regime change operation, including: did the U.S. support the use of terrorism and exacerbate racial divisions in British Guiana in order to make it more likely that Cheddi Jagan would lose his reelection bid in 1964? This paper is relevant for understanding what motivates states to use covert regime change but also to assess the lasting consequences of such actions on the targeted state, in this case British Guiana which is still struggling from the divisions that were created in 1964.

Sleeves Up and STICK IT: Vaccinations Among Undergraduate Students
Christina Rashel Coleman, Malak Nayeli Haifa, Natalie Nagib, Juliana Catherine Rendle
Faculty Mentor: Donna Lee Ettel-Gambino (Judy Genshaft Honors College)

Recent studies have shown that the level of vaccine knowledge is directly correlated with the willingness of individuals to receive a vaccine. The purpose of this study is to evaluate whether a student’s focus of study would influence their decision to receive one of the COVID-19 vaccines as they become available. A causal-comparative approach was utilized. A multivariate analysis of variance was conducted among undergraduate students (n=365) enrolled at the University of South Florida. The independent variable is the student’s field of study. The dependent variables included students’ reports of 1) worker status; 2) knowledge of persons who tested positive; 3) knowledge of a person who passed; 4) trusting the vaccine offered protection; 5) vaccination status; 6) booster compliance; and 7) COVID testing accessibility at USF. This study identified two statistically significant findings. (1) The proportion of students (83%) who report that the COVID-19 vaccine offered protection (p<0.02); and (2) the proportion of students (89%) who report receiving the COVID-19 vaccine (p<0.03). Findings identified differences among the fields of study within the university regarding willingness to receive the vaccine, as well as trust in the vaccine’s efficacy. Students who identified their major as public health and nursing were more likely to believe in the importance of vaccination for protection in contrast to students who reported other majors. Nursing students reported being vaccinated more frequently than other majors. Students who identified themselves as education majors were the least compliant with CDC recommendations about obtaining a vaccination.

Beyond “Sounding it Out:” Supporting Young Writers
Megan Conrad
Faculty Mentor: Jolyn Blank (College of Education, Curriculum, Instruction and Learning)

Writing with young children helps them acquire literacy skills they can use to make meaning and communicate their ideas. Previous research has shown that children develop as writers when teachers actively scaffold their writing and provide them with multiple strategies to write for meaning. In this teacher inquiry project, I explored ways to build my kindergarten students’ writing independence. I asked the question: Will providing students with strategies other than “sound it out” improve their writing independence? Data sources included anecdotal records developed from classroom observations, video recordings of writing instruction and students’ engagement in writing, and student writing samples. I expect to find that when children are explicitly taught multiple strategies “beyond sounding it out” they will gain more confidence in themselves which will enable them to build
their writing independence. Providing young children with scaffolded writing experiences and multiple writing strategies is critical to fostering their independence as writers, improving their writing in kindergarten and beyond.

Montaigne on Modern Education: How Teaching Philosophy Promotes Better Lives
Madison Cosby
Faculty Mentor: Roger Ariew (College of Arts and Sciences, Philosophy)

In my final research paper, I examine the ideas of the 16th-century philosopher, Michel de Montaigne, in his essay On the education of children; I argue how his suggestions for teaching children should be applied to modern-day education. He aims to solve a flawed education system, and though after 400 years improvements have been made, I argue Montaigne would ultimately say our education systems have not progressed. They still rely on outdated forms of learning like heavy memorization, strict teaching styles, and a lack of critical thinking development. He explains eight changes we should implement in our education: Make Education Enjoyable, Teach Students Holistically, Encourage Child Independence, Learn from Others, Critical Thinking Over Memorization, Make Content Applicable to Life, Prioritize Finding the Truth, and Clear Over Complex Writing. He believes philosophy should be the front runner for education since it helps students develop critical thinking skills, evaluate ideas, and find meaning in their lives. I prove his ideas on education are still relevant today, and if implemented, will improve students’ intelligence, well-being, sense of self, and more.

NAFLD Disease State Knowledge Base. How Far Must We Traverse to Update and Educate the Medical Community
Isabelle Crotley and Keianna Hawthorne
Faculty Mentor: Guy Neff (Covenant Research)

Recent alarming increase of medical concerns, such as non-alcoholic fatty liver disease (NAFLD), have been correlated to the medical condition of obesity. Primary care providers (PCP) play a role in not only identifying risk factors associated with medical conditions but also in being knowledgeable of these risk factors. A cross-sectional survey, still on going, is being used to evaluate PCPs along the west coast of Florida base knowledge of NAFLD that practice in the field of family practice, internal medicine, and mid-level providers. To pinpoint where discrepancies in knowledge exist and what future educational efforts regarding NAFLD may need to be considered. The questionnaire contains three categories: general NAFLD information, diagnostic acumen, and disease state outcomes. With an ongoing comparison graph of the PCPs years practicing to their raw score on the questionnaire. The results revealed a deficiency in general knowledge regarding NAFLD; with 11.1% of correctness for general NAFLD information section, 44.4% for Diagnostic Acumen, and 29.6% for disease state outcomes. Among the disparities in answered correct, each provider was able to acknowledge genetics predispose a patient to develop NAFLD. The results demonstrate a need for educational commitment towards NAFLD to reduce the discrepancies that exist when understanding the disease process of NAFLD.
Play-Based Mathematics in Early Childhood Education
Audrey Crotts
Faculty Mentor: Jolyn Blank (College of Education, Curriculum, Instruction and Learning)

According to the National Association for the Education of Young Children, play promotes joyful learning of content area knowledge. In play-based math instruction, children acquire math knowledge and skills while strengthening their dispositions to engage in mathematical thinking. The purpose of this study was to describe the implementation of play-based teaching strategies. I explored the question: How can teachers make math meaningful for young children through play or math games? This study was conducted in a state-funded pre-kindergarten classroom. Data sources included anecdotal records and transcripts created from video/audio-recordings of children’s engagement in play-based math instruction, photographs of children engaged in play-based math learning, and student work samples. I expect to find the integration of play-based math experiences engaged children and increased the complexity of their mathematical thinking. As early childhood educators, it is crucial that we make math learning meaningful and engaging for young learners.

Hydrotherapy: An Ayurvedic Healing
Casey Cubitt, Miguel De Vicente Marquez, Amelia Jefferson
Faculty Mentor: Holly Donahue Singh (Judy Genshaft Honors College)

South Asia is known for its wide variety of traditional and non-traditional medical practices. Throughout history, water has been seen and depicted as a source of life, health, and rejuvenation. In South Asia, water is even used as a treatment for certain ailments. Hydrotherapy can be defined as the use of water for the promotion of health. It was not only huge in Ancient Greece and Rome, but it was also heavily used in ancient India by Ayurvedic practitioners. Ayurvedic healing is a natural system of medicine that focuses on preventing illness as opposed to responding to the symptoms. Some of the benefits of practicing hydrotherapy include the reduction of acne, depression, arthritis, and other physical disorders. Bhutan uses hydrotherapy as a common treatment and has integrated it into the norm of medicine. In this project, we will be exploring the cultural context of hydrotherapy in Bhutan, along with its uses and benefits.

Nutrition and Premenstrual Syndrome: Should Nutritional Guidance be Implemented during OB/GYN Visits?
Nichole Cufino
Faculty Mentor: Cheryl Vamos (College of Public Health, Center of Excellence in Maternal and Child Health Education, Science and Practice)

A scoping review is being conducted following the PRISMA-ScR protocol to identify the extent of evidence regarding the impact that nutrition has on premenstrual syndrome (PMS). A set of search terms were translated across PubMed, CINAHL, Embase, and Scopus to collect academic journals published between 1996-2021 based on set inclusion and exclusion criteria. Data collection is currently underway and organized in categories including details on the population, intervention, comparison group, and outcomes found. The main results found will present what nutrients through diet and/or supplementation are currently presented in literature to directly impact PMS symptomology. The results section will discuss the characteristics of the sample groups and
different types of nutritional interventions and study designs used. The scales used to measure PMS and countries that these articles are conducted in will also be discussed to provide a global overview of the current state of the literature on PMS and nutrition.

**The Process of Designing a Chatbot to Link Youth to Mental Health Resources**

Kierra Cydrus, Shelton Gilyard Jr., Gabriella Sanabria, Dr. Kristin Kosyluk, Jerome T. Galea  
Faculty Mentor: Jerome T. Galea (College of Arts and Sciences, Social Work)

Conversation agents or “Chatbots” are used on various websites, such as banking and customer service portals, to help users navigate information and services. This study aims to create a chatbot to help link youth attending a sexual health clinic to mental health resources. We convened a Youth Advisory Board (YAB) comprised of 7 youth aged 16-24 years and, from June-September 2021, met three times to: 1. Identify the features and resources desirable in a mental health chatbot navigator; and 2. Interact with early versions of the chatbot, which was responsive to their preferences. After the second and third YAB meetings, the chatbot was further developed for a version ready for pilot testing among youth who were not part of the YAB. Next, beginning in December 2021-present, we began recruiting youth from the collaborating sexual health clinic to try the chatbot and provide feedback on their experience. To date, we have recruited 11/20 participants. The YAB provided an initial set of preferences for the chatbot, which included gender-neutral language, a personalized feel and self-help exercises (e.g., a breathing exercise to calm anxiety). Initial data indicate a preference for a chatbot that does not sound too robotic or clinical and free from excessive text. Additionally, there is a preference for the chatbot to be simple and efficient to use. A chatbot connecting youth with mental health resources appears feasible and acceptable; however, future development responsive to youth’s preferences tested in larger and more diverse samples is needed to assure acceptability.

**Pregnancy & Prenatal Apps**

Heba Daas  
Faculty Mentor: Marielle Machacek (College of Arts and Sciences, Psychology)

This presentation will describe a deep introspection and an evaluation of five prenatal and pregnancy-related apps that all serve the same purpose in assisting and educating women and soon to be caregivers about pregnancy as they experience the usual nine month wait in tracking a baby’s development or having a community of experienced/ non-experienced soon to be mothers and fathers. The five apps being investigated are the Ovia Pregnancy Tracker, Pregnancy Tracker BabyCenter, Pregnancy & Baby Tracker WTE, Pregnancy + Tracker App, and the Bump - Pregnancy Tracker. Questions are imposed upon these pregnancy-prenatal apps giving an insight to how these apps can internally and outwardly improve the well-being of the carrier during pregnancy.

**Is COVID Sexist?**

Lily Stowe Daum, Mel Valliari, May Marie, Natalie Nagib, and Juliana Catherine Rendle  
Faculty Mentor: Donna Lee Ettel-Gambino (Judy Genshaft Honors College)

 Millions of college students have been navigating life in a pandemic over the past two-years. Part of that discovery is the decision to vaccinate oneself for the better safety of our nation. Prior research suggests that higher vaccination coverage supports herd
immunity which would ultimately reduce the infection rates of COVID-19. The purpose of this study is to better understand undergraduates understanding of COVID-19 transmission by gender. A causal-comparative approach was used to conduct a multivariance analysis of variance (MANOVA) utilizing SAS-9.4 (Cary, NC). The independent variable was the student’s gender. The dependent variables include: 1) the agreement that face-to-face contact can spread COVID-19; 2) compliance to social distancing with infected individuals; 3) Internet usage for information on COVID-19; 4) compliance with CDC vaccination suggestions; and 5) Compliance with booster. The findings of the MANOVA identified one statistically significant criterion. Overall, students (88%) reported they agreed that the virus spread through face-to-face contact p<0.0001, Females (90%) were more likely agree to the statement then their male counterparts (88%). Evidence suggests female respondents are more likely to agree that COVID-19 spreads from face-to-face interactions than their male counterparts. These findings may assist university efforts to better inform and educate all students about the risks of contracting COVID-19 and incorporate policy to mitigate this virus. This information is first of its kind in discussion of gender and knowledge about COVID-19. Knowing this, educating college-level students about vaccination benefits and safe practices is crucial to gain national herd immunity and ensure student safety.

**Building Positive Student-Teacher Relationships in Early Childhood Education**

Brianna Davis  
Faculty Mentor: Jolyn Blank (College of Education, Curriculum, Instruction and Learning)

Positive student-teacher relationships facilitate children’s school adjustment, academic learning, and social-emotional development. According to research, the relationships students build with teachers help them develop a sense of security within themselves, so they are more comfortable to explore and engage in new learning in the classroom. However, building trusting relationships require more on the part of the teacher than just “being nice”. This study explored the question: How can I build positive student-teacher relationships to help students gain confidence in their learning and abilities? Data sources included anecdotal records developed from observations, an observation checklist, and student work samples. By describing specific strategies for building positive student-teacher relationships, I illustrate effective relationship-building techniques. I expect to identify strategies for building positive relationships that increase students’ motivation to finish and learn new things even if they get upset and frustrated in the beginning. This study’s findings are important in terms of helping teachers of young children intentionally develop trusting relationships with their students.

**Traditional Herbs Used in Modern Medicine**

Julianna DeGaetano  
Faculty Mentor: Holly Donahue Singh (Judy Genshaft Honors College)

Within global health it is important to look at how culture and religion plays a role in healthcare and how patients may be treated. Taking a closer look at Ayurveda medicine in India, helps to analyze how religion and culture influence the medication and treatment given. Ayurvedic medicine puts more emphasis on the treatment of the body and soul as a unit rather than treating a single body part. Followers of Ayurveda medicine prefer to use herbal medicines to treat illness. Many of these herbs are native to Southeast Asia and have been used in Indian culture for many years. Herbs such as Ajwain and Brahmi are very common in Ayurveda medicine and have many different properties that affect the body. Ajwain is commonly used to treat hypertension and high blood pressure, while Brahmi is a neuroprotector that has benefits to help the brain. Some of the more common herbs such as Brahmi and Ajwain have been used in clinical studies for modern medicine to test the affectivity of these herbs over
pharmaceutical drugs. There are still many other herbs that are used in ayurvedic medicine that have not be clinically tested but have been in use for centuries. This poses a problem as the side effects from these herbs may be unknown and scientists worry that they will not be able to regulate access to them.

Supporting Emerging Writers in a Kindergarten Classroom

Kyra Denington
Faculty Mentor: Jolyn Blank (College of Education, Curriculum, Instruction and Learning)

Teachers need to utilize a wide range of strategies to provide high quality writing instruction to diverse learners in early learning contexts. With limited time and resources for differentiation in a classroom, it can become natural for educators to rely on the same strategies for writing instruction, such as guided writing and “sounding out” words. However, these strategies are not always effective, especially with students who are still struggling to establish the foundational skills necessary for writing. The purpose of this study is to describe how the use of a combination of strategies for teaching writing supports struggling writers’ learning. Data, including work samples and anecdotal records developed from classroom observations, will be collected during a weekly small group time dedicated to writing instruction as well as during daily classroom life. I expect to find that focused writing instruction and the use of multiple strategies will have a positive impact on children’s writing abilities. These findings can be used to better support students who are struggling with writing by helping educators to become less dependent on a limited set of strategies.

U.S. Health Care Disparities Among Low-Income Populations

Samantha Deveaux
Faculty Mentor: Joe Bohn (College of Public Health)

The purpose of this study is to examine the correlation between lack of insurance and increased social needs regarding access and affordability of health care in the United States among lower-income populations. The national health interview survey of 2017-2020 was used to investigate the incidence of adverse health problems in relation to disadvantaged populations. As a result, these populations do not have regular access to preventative care or mental health resources which causes a definite distrust in care providers and the health care system. Research has shown that while one-fifth of disadvantaged adults reported their health as poor, higher-income adults reported an exceptionally low rate of five percent (5%). In regard to mental health, while those with limited income report a psychological distress rate of seven percent (7%), higher-income populaces face a distress rate of one percent (1%). The most glaring research depicts an extremely low insurance rate among low-income of twenty six percent (26%) while higher earning individuals have an uninsured rate of only four percent (4%). This study conclusively evaluates the correlation between low-income populations and adverse health problems as a result of increased social needs and lack of health insurance.
Case Study of Bilingualism and Linguistic Variation within an Individual with DID
Summer Devlin
Faculty Mentor: Brandon Tullock (College of Arts and Sciences, World Languages)

The study will investigate the effects of altered identity states on linguistic performance in a bilingual individual with dissociative identity disorder (DID). DID is a disorder typically caused by physical or sexual trauma during childhood (Kruft, 1996). While much is known about DID’s dramatic impact on the personality, little is known about its effects on individuals’ linguistic capabilities. This case-study will focus on a bilingual female with DID who has thirteen identities. The identities, known as “alters”, differ in age, gender, memories, speech patterns, and other traits. The language performance of the alters will be tested through a structured interview using picture composition tasks where each identity will tell a story based on the given images. This exam will be conducted in English and Spanish for each identity. The results will be audio recorded and transcribed, then analyzed based on accuracy, complexity, and fluency within each language.

Children and Drug Trafficking in Brazil: Can International Law Provide Protections for Children Involved in Drug Trafficking?
Veridiana Bessa Franciozo Diniz
Faculty Mentor: Jody McBrien (College of Arts and Sciences, Interdisciplinary Global Studies)

Brazil has seen a rise in children in narco-trafficking due to increased conflicts between factions and local law enforcement. Mainstream media and scholars tend to frame actions of these factions as organized crime, ignoring the generalized violence the communities and children experience. The aim of this study is to analyse whether or not Brazilian children involved in drug trafficking can be classified as child soldiers. Drawing from the international definition of Armed Conflict in Article 3 of the Geneva Convention of 1949 and Article 1 of the Additional Protocol II, and comparing situations of realities faced by Brazilian children involved in narco-trafficking, we argue that their reality is analogous to that of child soldiers, as defined by the Paris Principles on the Involvement of Children in Armed Conflict 2007; thus, going beyond the organized crime definition. In characterizing them as child soldiers, we argue for improving the children’s ability to be reintegrated into society, with the collective help of the international community.

Exploring the Impact of the COVID-19 Pandemic in India Through the Lens of Gender & Vulnerability Within the Domestic and Social Sphere
Khushi Doshi
Faculty Mentor: Holly Donahue Singh (Judy Genshaft Honors College)

The progression of COVID-19 led to a myriad of different disparities emerging globally. However, gender disparity remained behind the shadows during COVID-19. The shadow pandemic of sexual abuse heightened where social mobility was restricted in response to the pandemic. In India, where patriarchy remains deeply rooted within social dynamics, the lockdowns amplified the problem of domestic abuse. Thus, to highlight a highly neglected aspect of the pandemic, this project focuses on accentuating how the pertinent global health crisis has instigated sexual abuse directed towards the women of rural India, whilst exacerbating
the plight of women from lower economic backgrounds. The sources analyzed deal with Indian women’s role in the informal work sector, gendered impacts of lockdowns, and the burdening domestic responsibilities. The research enabled encountering sources that utilize external publications, sources, and telephone surveys, whilst others utilized surveys, interviews, and analyses of newspaper sources to understand the pandemic’s influence on women’s predicaments. The sources provide firsthand accounts of how social immobility, financial hardships, and loss of livelihoods instigated the prominence of gendered differences within the domestic sphere. The literature material obtained led to an overarching inference that the intertwining of lockdowns, unemployment, and financial hardships due to COVID-19, with the gendered dynamics of the domestic and social sphere, led to the exacerbated vulnerability of women in India.

Colleges on COVID-19: How College Choice Impacts COVID-19 Related Behaviors in University Students

Kelly Nicole Drago, Huichang Xu, Natalie Nagib, and Juliana Catherine Rendle
Faculty Mentor: Donna Lee Ettel-Gambino (Judy Genshaft Honors College)

Evidence suggests that university students are likely to change their behaviors because of COVID-19. This study was conducted to examine what colleges within the university students are a part of and their COVID-19 related behaviors. A multivariance analysis of variance was conducted utilizing SAS 9.4 (Cary, NC). The independent variable was the college to which the student was enrolled. The dependent variables were the students compliance with the following survey questions; 1) concern/worry about Omicron variant; 2) face touching; 3) frequent handwashing; 4) wearing a mask indoors; 5) wearing a mask outdoors; 6) vaccination status; and 7) current with booster. This study resulted in two statistically significant findings. (1) The proportion of students (93%) who report wearing a mask indoors (p<0.04); and (2) the proportion of students (83%) who report washing their hands frequently (p<0.0004). These data also suggest that there is a 27% difference between the proportion of students who wore a mask indoors and outdoors. These findings provide contextual evidence that the majority of undergraduate students are following health care policies at the university. Further research may be conducted to analyze how policy information is being shared on college campuses and what communication tactics are effective for understanding between the different colleges. Continuing discussions about health care policies may positively impact the likelihood of college students changing their behaviors in order to maximize healthcare outcomes and simultaneously mitigate spread of COVID-19. Successful communication and understanding of health care policies may allow for more effective implementation of policies.

Recognizing and Building Upon Diverse Communicative Competencies In Young Children

Magie Duckwitz
Faculty Mentor: Jolyn Blank (College of Education, Curriculum, Instruction and Learning)

Students enter the classroom with a diverse range of communication capabilities. Young learners with expressive language delays often struggle to communicate verbally. Research suggests Universal Design for Learning (UDL), an approach to teaching aimed at meeting the needs of all students, is an effective way to support language learning in inclusive classrooms. The purpose of this study is to better understand how to recognize and build upon young children’s diverse communicative competencies in an inclusive Pre-K classroom. I will focus on integrating targeted words, the UDL strategy, and documenting children’s responses. Data sources for this study include audio/video recordings documenting language use in a social setting. I expect to find
children’s communicative competencies are enhanced by introducing new words in response to their natural curiosity about an object or action. This is important because understanding the ways children communicate, verbally and non-verbally, can help teachers better support their language development and understanding of concepts.

**The Biological Significance of Imidazole-based Ionic Liquids in Protein Interactions**  
Nelly Edin, Dahlia Martinez, and Dr. Marlius Castillo  
Faculty Mentor: Marlius Castillo (College of Arts and Sciences, Chemistry)

The biological activity of ionic liquids (ILs) has been of great interest in the last few decades due to their application as catalysts, solvents for proteins, and drug delivery systems. ILs are molten salts, composed of organic-based small molecules with an extensive catalog of possible combinations. The effect of ILs on proteins has received special attention as proteins play a role in the structure, function, and regulation of cells, tissues, and organs by for example acting as catalysts and transporting material across biological membranes. This project focuses on imidazole-based ILs and their interaction with proteins. Understanding the effects of ILs on proteins is therefore paramount in evaluating their applicability to biological systems where ILs thus far have been observed to influence protein stability and catalytic action. Imidazole-based ILs have comparatively medium biosafety with low vapor pressure and thermal stability, accessibility, and are highly tunable in nature whereby physical; m.p, b.p, viscosity; and chemical properties can be readily altered making them an excellent choice for study. The goal of this research is to investigate how imidazole-based ILs affect a library of different proteins, discerning the success, failures, and opportunities in the field will offer us the direction for our studies and future contributions.

**Microplastic Identification in Soil Samples of Urbanized Depressional Wetlands**  
Kelli Elliott  
Faculty Mentor: David Lewis (College of Arts and Sciences, Integrative Biology)

Little is known about the effects of microplastics on human health, but they are suspected to be mutagenic, carcinogenic, and able to weaken the body’s immune system. Microplastics originate from fragmented pieces of larger plastics, which are released into aquatic environments from various sources including urban, residential, and commercial land-use types. There have been numerous studies focusing on the quantity and composition of microplastics within marine environments; however, there is still a paucity of research on the abundance of microplastics within freshwater systems, like depressional wetlands. Depressional wetlands are likely to act as reservoirs of microplastics due to their natural ability to filter and trap other pollutants like nutrients and heavy metals. The aim of this study is to assess whether there is a significant difference in microplastic type and abundance within the top 30cm of soils in wetlands throughout the Tampa Bay region. These wetlands have been selected along an urban-to-rural gradient to assess how quantity and identity may vary depending on surrounding land-use. It is predicted that wetlands surrounded by higher levels of urbanization will have a greater abundance of microplastics compared to wetlands located in rural areas. Elevated levels of microplastic abundance in these wetlands are likely to affect the ecosystem services these wetlands provide like biodiversity support, improved water quality, and floodwater storage. Thus, it is essential to conduct research studies assessing microplastic abundance and composition as a potential threat contributing to their degradation.
Analysis of Concurrency of Echosens FibroScan CAP Scores with Proton Density Fat Fraction for Hepatic Steatosis
Melisa S. Escobar, Alaina Rinaldi, Gabriella M. Hernandez and Guy W. Neff
Faculty Mentor: Guy Neff (Covenant Research)

Non-alcoholic fatty liver disease (NAFLD) has become the most common liver disease worldwide, and the healthcare system is burdened by the unmet need for a high throughput noninvasive method of diagnosis. Liver biopsy with ballooning confirmation is the gold-standard for NAFLD diagnosis. However, consistency with determining ballooning has been plagued in part due to interrater reliability issues amongst pathologists. The global Hepatology community is working towards possible Non-Invasive Testing (NIT) for NASH. The MRI-PDFF (proton density fat fraction) has shown promise for potentially quantifying steatosis in NAFLD patients. Our hypothesis is to compare MRI-PDFF values and Echosens FibroScan CAP scores for sensitivity to grade 1 steatosis amongst various morbidities and demographic groups.

Our History Need Not Be Our Demise: An Investigative Study on the Association Between Hispanic/Latinx Ethnicity and COVID-19 Vaccine Openness in College Students
Keven Espinet-Pizarro
Faculty Mentor: Marina Bornovalova (College of Arts and Sciences, Psychology)

Although there is preliminary support for an association between Hispanic race/ethnicity and decreased openness to receiving the COVID-19 vaccine in the general population, extant literature lacks research investigating whether this trend is observed in college students specifically. Prior discrimination, lower socioeconomic status, and distrust in governmental intentions have been described as potential moderators of this association. However, college students have been described as a population different than the general population; hence, understanding these key differences is essential to tailoring vaccination efforts in a more effective manner to help college students make better-informed decisions. The present study was among the first to address the link between Hispanic race/ethnicity and COVID-19 vaccine openness in college students specifically. Qualtrics surveys were administered to 304 college students in the southeastern United States. Chi-square analysis of the findings did not support a correlation between Hispanic race/ethnicity and COVID-19 vaccine openness in college students. These results suggest the link observed between Hispanic race/ethnicity and COVID-19 vaccine openness in the general population may be missing from college student populations. Future research might seek to replicate this study using students from various disciplines, while investigating factors that seem to decrease the prevalence or effect of prior discrimination, lower socioeconomic status, and distrust in governmental intentions in college students.

Basic Lunar Task Variations and Safety Analysis for NASA Lunar Surface Operations
Sandra Faragalla
Faculty Mentor: Stephanie Carey (College of Engineering, Mechanical Engineering)

Due to the challenges of being in a different gravitational environment such as on the moon as well as dealing with the confinements of performing tasks in an EMU suit, the likelihood of astronauts falling as well as fatigue increases. Astronaut safety may also be affected by differences in task performance and tool use. The purpose of this study was to assess the
safety of possible lunar tasks as well as subject task variations by collecting and analyzing motion capture data from subjects performing basic lunar tasks which will be used to create and enhance future biomechanical models. This information can also affect spacesuit design, lunar craft design, and many other mission factors. A Vicon Nexus Motion Capture system with 8 MX T20-S cameras, two AMTI OR6 force plates, and a Full Body Plug-in-Gait marker set (39 markers) was used to collect and analyze subject data for comparison of calculated joint angles and stability. Tasks such as walking, squatting, lifting, hopping, and climbing stairs to mimic egress were completed by subjects. Tasks were chosen based on researching past lunar missions and possible tasks for future missions. Tasks also included using tools such as a shovel, rake, tongs, hammer, and storage container. Some of this data was previously presented at the 2022 Human Research Program Investigators’ Workshop conference. Although no subjects fell during data collection, some were fatigued after performing certain tasks such as bending down on one knee or lifting weights, and variations of tool use between subjects were evident.

Home-made Detection of Nitrates in Drinking Water: A Modification of Colorimetric Detection Methods
Derrica Ferguson
Faculty Mentor: Katherine Alfredo (College of Engineering, Civil and Environmental Engineering)

Nitrates are common agricultural contaminants of drinking water. The ingestion of nitrates can cause a variety of issues, including methemoglobinemia and colorectal cancer. Those who have private sources of drinking water, such as a private well, and live in agricultural areas are more predisposed to experience this chemosocial environment. The maximum contaminant level (MCL) of nitrates in drinking water is 10 mg/L NO3-N. Therefore, these private individuals should monitor the nitrate contaminant level to ensure clean and healthy drinking water and take appropriate measures. A modification to industrial colorimetric detection methods was determined by replacing spectrophotometers with a mobile app, Color Grab®, that measures color values, such as CMYK values, which could be used as an indicator of nitrate concentration in drinking water. It was shown that Y% color values that surpassed 30% were indicative of drinking water samples that exceeded the MCL of nitrates. However, other mobile apps that measure color value should also be tested to determine their suitability within this modified method.

An Analysis of Sickle Cell Trait Tests Given to Student Athletes at Schools with Division I Football Leagues
Elizabeth Finley, Lorena Madrigal
Faculty Mentor: Lorena Madrigal (College of Arts and Sciences, Anthropology)

The increased mortality risk of athletes who carry the sickle cell trait (SCT) has been the topic of clinical, discussions (Doerfler et al., 2021; Eichner, 2021; Flansburg et al., 2019; Nye et al., 2021; O’Connor et al., 2021). Most people born in the USA are tested for presence of SCT at birth. Nevertheless, the NCAA encourages Universities and Colleges (UaC) to test for presence of SCT in incoming athletes. The CDC has clear recommendations on the type of tests that are reliable, namely: a complete blood count (CBC), hemoglobin electrophoresis, high performance liquid chromatography (HPLC), and DNA testing. The SDC also recommends against using sickle cell solubility tests, as these results are misleading. The purpose of this study is to determine whether UaC are following the CDC’s recommendations. We collected information from a total of 105 athletic departments, who answered the question of what test they used. We used the SAS statistical package to test for independence of variables.
Out of 105 athletic departments, 32 (30.5%) asked their athletes to get tested outside of the institution. The most frequently performed test was the SC solubility test, which was used by 62 of the 105 departments (85%). These data show that most of the athletic departments we called are implementing the test not recommended by the CDC or they are asking their athletes to take it themselves someplace else. The unreliable test should no longer be given.

Initial Improvements in Cochlear Stria Vascularis Cell Lines with 3D Cell Culturing
Tobias Florido Campos de Souza
Faculty Mentor: Robert Frisina (College of Engineering and Morsani College of Medicine, Medical Engineering)

The influence of the extracellular matrix on cellular function is already well known in the scientific community. This project explores the effects of 3D culturing cell lines on hydrogels that mimic the extracellular matrix found in native tissue. Several protocols and techniques for analyzing cell behavior in a 2D system exist. The same cannot be said about protocols to analyze cells cultured in a 3D environment. First, there is one standard method to culture cells in 3D. And second, because it is a relatively new field, where there is still much to learn and space to improve. The present project will focus on cells cultured on hydrogels, more specifically cells cultured on top of a hydrogel layer since the stria vascularis SV-k1 is an epithelial cell line.

The Confidence-Knowledge Disconnect in COVID-19 Death Estimates
Caitlin Franklin, Sung Pyo, Brittnee Hampton, Austin Katz, Sandra L. Schneider
Faculty Mentor: Sandra Schneider-Wright (College of Arts and Sciences, Psychology)

High confidence does not always lead to accurate estimates. The Dunning-Kruger Effect describes a tendency for people to be confident in their abilities in various academic and social domains despite their lack of knowledge (Dunning, 2011). We studied this possible confidence-knowledge disconnect regarding the Covid-19 pandemic. We also looked to see whether the confidence-knowledge disconnect varies based upon cognitive and attentional differences. This study aims to highlight cognitive characteristics which may predict the size of the confidence-knowledge disconnect. As part of a larger online survey, participants were asked to estimate the current number of Covid-19 deaths in the U.S. Participants were also asked how much Covid-19 news they watched, how informed their death estimate was, and how confident they were in their estimate. Then, participants completed a concentration task followed by the Decision Style Survey indicating their tendency to be intuitive versus analytic, and finally, reported news consumption behaviors. We predicted that an analytical decision style, higher levels of concentration, and more Covid-19 news consumption would be associated with a smaller confidence-knowledge disconnect. Results show relatively weak improvements in the accuracy of Covid-19 estimates with greater confidence. We are continuing to explore whether concentration and analytic decision style are associated with smaller gaps between knowledge and accuracy. These findings may help predict characteristics that are associated with misconceptions about Covid-19 death rates. If cognitive and attentional differences alter the confidence-knowledge disconnect, it may be useful to encourage stronger thinking skills to reduce inaccuracies in assessments of current events.
Supporting Young English Language Learners’ Reading Comprehension  
Annalys Gonzalez and Rebecca Andion  
Faculty Mentor: Jolyn Blank (College of Education, Curriculum, Instruction and Learning)

The number of students designated as English Language Learners (ELLs) in U.S public schools continues to increase. Although improving the education of ELLs is a national educational priority, most multilingual students are placed in full immersion English-speaking classrooms with teachers who lack preparation for teaching ELLs. In order to help students who are struggling with comprehension and expression because they are learning more than one language, we examined how teacher questioning and responses affected these students’ learning. Our research question is: How do teacher prompting and questioning affect ELLs’ engagement in reading? Data sources include anecdotal records and transcripts of questions and responses created from video/audio recordings of our ELL instruction. We also gathered student artifacts such as exit tickets. We expect to find varying our questioning, rephrasing, and scaffolding language use will support ELLs’ reading comprehension. This study is important because it provides insights into the ways teachers can use specific strategies to support multilingual learner’s school success.

The Fusion of Ayurvedic Medicine and Biomedicine in Modern India  
Trey Gould  
Faculty Mentor: Holly Donahue Singh (Judy Genshaft Honors College)

This paper will focus on researching the general health and health practices of the Indian population by region. More specifically, if they practice more traditional ayurvedic medicine and wellness programs or take a biomedical approach (often seen as more western or modern). From here, the overall health in terms of life span, sickness rates, and mortality to different diseases, for example, will be compared by practice type. Not only will this give an idea of the varying effectiveness of each type of medical practice, but it will also allow some social perspectives into view by way of discussion of the history of these two seemingly contrasting medical practices, and how they might come together to meet the needs of a modern world.

Diet Reconstruction of a Medieval Transylvanian Population  
Sydney Griggs  
Faculty Mentor: Jonathan Bethard (College of Arts and Sciences, Anthropology)

Bio-archaeology is a field focused on examining human skeletal remains and creating osteobiographies of these people, which describe their life histories. Osteobiographies can give us individual level information by examining pathologies on the skeleton, as well as population level information with important social and cultural implications. An example of this is diet reconstruction, which is the method used in this project. In this study we preformed isotope analysis on the collagen and apatite of over 100 individuals from the medieval Transylvanian archaeological site in Patakfalva, Romania. We used mass spectrometer analysis to examine carbon and nitrogen isotopes which gave us information about the plant and animal proteins the individual likely consumed, respectively. Using this information, along with apatite samples, we performed collagenapatite spacing which gives us a general idea about population dietary habits. In the Transylvanian population we expected to see dietary habits similar to other medieval populations in Europe, which would consist of mostly cereal grains and little meats. We also expected to see
differences in diets based on social class, with upper-class individuals consuming more meats and more diverse plant proteins. Based on the data, we concluded that the population showed a diet consistent to other medieval European populations. Additionally, there were clear implications of social stratification based on the data and burial sites. Continued research at this site can give a more in depth understanding of the daily lives of the Szekler people.

**Herd Immunity**  
_Akul Gupta, Dang Nguyen, Shivani Padhye, Juliana Madej_  
Faculty Mentor: Atsuko Sakai (Judy Genshaft Honors College)

Throughout the pandemic, the lack of awareness regarding hygiene, personal protective equipment (PPE), vaccination, and more has been detrimental to global health. Early education is vital to combating this pattern long-term, and the goal of Herd Immunity is to create a board game focusing on common infectious diseases to provide youth with safe practices as demonstrated by scientific literature. Each player or team will have a game piece designated to them and there will be dice to go around the board. There will be question mark squares with cards in the middle of the board that will include hand-washing, masks, vaccinations, quarantine, etc. Correct answers about specific diseases or general preventative measures will give players immunity points. Each time the player completes a round without getting sick, they will receive immunity points to imitate increased antibody count. Players who run out of points lose and whoever has the most points wins the game. Especially for students with learning disabilities like ADHD, board games are an effective way to educate through entertainment. Herd Immunity will collaborate with doctors who specialize in primary care and infectious diseases to verify the content, and biomedical engineering students will develop the physical product. The end goal will be to sell the product online or earn funding to provide the board game to both disadvantaged families who are at risk and K-8 schools because families may not support certain safe practices regarding infectious diseases.

**Supporting Positive Behaviors in Classroom: Fostering Young Children’s Social Competencies**  
_Katelyn Hall_  
Faculty Mentor: Jolyn Blank (College of Education, Curriculum, Instruction and Learning)

Social competence refers to a complex interplay of thoughts, feelings, and skills used to build and maintain positive relationships, cope with frustration or other strong emotions, solve problems, and manage conflict. Young children may lack appropriate social skills due to a lack of opportunities to practice them with guidance. Research suggests that when teachers of young children are faced with challenging behaviors in their classrooms, it is important that they help children replace challenging behaviors with appropriate skills. In this study, I explored the question “How can I support positive behavior in my first-grade classroom?” Data sources included anecdotal records developed from classroom observations, audio-recordings of classroom conversations, and student artifacts such as behavior incentive plans. I describe the use of specific strategies to foster children’s social competencies. Findings will provide insight into the range of strategies teachers can use to effectively promote positive behaviors in the classroom. Fostering social competencies is critical to children’s school success.
The Effects of Increased Telemedicine Appointments due to COVID-19 on the Amount of Cancer Screenings Ordered/Performed

Rana Hanna, Helena Beltran
Faculty Mentor: Karim Hanna (Morsani College of Medicine, Family Medicine)

At the start of the COVID-19 pandemic, cancer screenings began to be delayed as in-person clinical visits were restricted. As a response to the pandemic, the use of telemedicine rapidly increased as a new technological platform used for remote patient care. Telehealth has become an essential means of communication between clinicians and their patients. Despite these advancements, limitations were still present amongst patients needing screenings. Although there is little consensus on the effectiveness of telehealth services in patients requiring oncological screenings during the pandemic due to its recency and the progressive nature of cancer, this research will serve the purpose of comparing the efficacy of telehealth-based services during the COVID-19 pandemic versus in-person clinic before COVID-19. With the necessity of routine cancer screenings for early detection and treatment, our research aims to evaluate the extent to which the increased use of telemedicine has affected procedural screenings during the COVID-19 pandemic. Ultimately, we hypothesize that the increased use of telemedicine during the COVID-19 pandemic led to a decreased amount of cancer screenings ordered/performed in patients.

In or Out: to Mask or Not to Mask

Isaac Charles Hernandez, Yash Nilesh Patel, Natalie Nagib, Juliana Catherine Rendle
Faculty Mentor: Donna Lee Ettel-Gambino (Judy Genshaft Honors College)

With COVID-19 presenting the major threat of a global pandemic, it is vital to understand which guidelines are being followed and which are being ignored. The purpose of this study was to determine if gender influences how people reacted to COVID-19 and its variants. A causal comparative approach was utilized. A multivariate analysis of variance was conducted utilizing SAS 9.4 (Cary NC). The independent variable was gender. The dependent variables were if 1) the vaccine protects against the omicron variant; 2) if they washed their hands thoroughly; 3) avoided infected people; 4) wore mask indoors; 5) wore mask outdoors; 6) followed physically distancing guidelines; and 7) If they were vaccinated. The findings of this study had one statically significant criterion: The significant criterion was wearing a mask outdoors with a value of p > 0.001. Overall students (93%) reported wearing their mask outdoors. This value means that when comparing the proportion of male students to the proportion of female students who do not wear their mask outdoors, male students (52%) were less likely to wear a mask outdoors than female students (71%). Implying that when looking at genders we can there is a difference in the level of compliance with guidelines for COVID. With this knowledge we may better understand what guidelines and to who these guidelines need to be encouraged to, this helps the public better protect themselves and others. We can also use this information to understand how we may better encourage guidelines for future or other diseases.
Outcomes of Pre-Screening Analysis for Non-Alcoholic Steatohepatitis (NASH) Subjects in a Large Clinical Research Center
Gabriella M. Hernandez BS, Mike Palou-Morales, Anna H.T. Nguyen, Joshua T. Ghansiam BS, Keianna L. Hawthorne BS, Guy W. Neff, MD, MBA
Faculty Mentor: Guy Neff (Covenant Research)

A primary obstacle within NASH clinical trials is the low randomization rates. The prescreening process is often minimized and creates low level of screening confidence. For most screening protocols, research subjects undergo three screening steps: 1) laboratory analysis, 2) MRI sequencing, and then 3) liver biopsy confirmation. We decided to investigate possible changes to our prescreening criteria in hopes of improving our randomization rates. Our prescreening criteria prior to December 2020 required AST values >20, various kPa values, and CAP score (Controlled Attenuation Parameter) of 280 or above. To reach our goal of higher randomization success, in December 2020 we changed the three criteria components: AST values >30, kPa values > 8.5, and CAP scores over 300. The hypothesis is to evaluate prescreening protocol improvements in the screening protocol that will result in higher randomization rates by altering our prescreening criteria. A retrospective multivariate analysis was completed evaluating randomized patients. Data collected includes the following: demographics, medical history for metabolic risk factors such as diabetes, BMI, waist circumference, hypertension, hyperlipidemia, and obesity, comprehensive serology including various laboratory values such as AST, MRI sequencing data, and liver biopsy outcomes. The prescreening protocol data collected prior to, and following December 2020 were compared. The data set includes 50 randomized patients from March 2020 to June 2021. The prescreening protocol change occurred December 2020. Demographics prior to December showed 56.8% male randomization rate compared to 61.5% after December. Female demographics show 43.2% prior to December and 38.5% after December. Male age ranged 25 to 83 years (mean 59 years). Female age ranged from 35 to 82 year (mean 66 years). After adjusting the screening criteria, an increase in the NAS (NASH Activity Score) from a median of 5.0 (4-8) to a median of 6.0 (4-7) was noted. Success rates for the following steps prior to and after December 2020 are as follows: Step 1 (75% to 85%), Step 2 (75% to 77%), Step 3 (50% to 54%). The overall screen pass rate was approximately 38.6% prior to December and increased to 48% after December 2020. The data above demonstrates that pathological analysis for NASH confirmation continues to remain variable leading to a higher screen fail rate. Adjusting AST to a higher value was beneficial, with no changes seen with the increase in CAP scores. Moving forward this data will benefit the NASH research disease state by identifying a more accurate prescreening criteria which will enhance clinical trial randomization efficiency.

“Champa Bay” Decay? The impact of brand image and championship success on Tampa Bay professional sports
Derek Hines
Faculty Mentor: Carol Osborne (Muma College of Business, Marketing and Innovation)

The Tampa Bay (TB) teams of the major sports leagues in America (Football, Hockey, and Baseball) have been experiencing high levels of success over the past few years. Despite all of the success, a lack of support has been evident for the TB Rays while the Buccaneers and Lightning have experienced no such lows. There are many potential contributing factors that may play into why the Rays do not garner their deserved support from the community (such as their stadium location, reputation of the majority owner, or poor marketing efforts), but ultimately can all be attributed to one main point: brand image. This thesis will look to
explore these factors by reviewing how the TB Buccaneers and TB Lightning have created positive brand images, how significant the problems are for the TB Rays, and after speaking with experts in the field of sports marketing and surveying college students in the TB area, coming up with potential solutions that could help the TB Rays moving forward.

**Associations between Forced Relocation and Experience of Non-Partner Sexual Violence in urban Haiti**

Jacqueline Houston, Marissa Jadotte  
Faculty Mentor: Guitele Rahill (College of Arts and Sciences, Social Work)

Globally, displaced populations are at heightened risks of non-partner sexual violence (NPSV). Haiti’s Cité Soleil (CS) residents are often forced to relocate in contexts of disasters and political turmoil. In this cross-sectional survey, CS residents completed a Haitian Kreyòl translation of the Adverse Childhood Experiences International Questionnaire (ACE-IQ) (N=640, age 18+). We analyzed relationships between forced relocation and Adult Experience of NPSV, by gender, using SPSS 27.0. Sexual violence in this sample was not limited to adult NPSV: Roughly 53% women (n=203) and 43.65% of men (n=110) reported experience of sexual abuse as children/adolescents (p=0.02); 33.63% of respondents who reported CASA also experienced NPSV since 18 (p<0.001). Among respondents forced to relocate, 26% (n= 129) reported experiencing NPSV as adults (p=0.98). CS residents in this sample would benefit from policies that emphasize human rights and penalize perpetrators of NPSV, and contextually grounded trauma-informed care to mitigate biopsychosocial consequences of displacement and NPSV. Future studies should consider protective factors for displaced persons in Cite Soleil who do not experience CASA or NPSV, and include threat assessment and prevention of CASA.

**Diversity Ranking of MPH Programs at Public Universities**

Jataya Jackson  
Faculty Mentor: Tricia Penniecook (College of Public Health)

The purpose of this study is to rank all the public universities in the United States with Master’s in Public Health programs based on the perceived diversity of their programs. A standardized ranking system has been formulated to measure the inclusivity and diversity of each program by analyzing the universities public statements and websites.

**Terminal Treatment: An Analysis of Palliative Care in India**

Michelle Jayaraj, Paige Mott, Shalini Subramanian  
Faculty Mentor: Holly Donahue Singh (Judy Genshaft Honors College)

The realm of palliative care is a relatively new specialty of care in Indian medical facilities, emerging only about 30 years ago. Major religious and culture aspects within the region have shaped how Indian physicians, healthcare workers, and patients respond to the concept of palliative care. Through a detailed literature search and analysis, the limitations and benefits of the current palliative care system in India will be discussed with approaches to pain management, psychosocial wellbeing, and the connotations presented with end-of-life care. The inextricable ties with religious practices and cultural norms in Indian medicine
have further emphasized ideas of natural death and suffering in current lives to avoid condemnation in next. Based on the principles of karma and natural healing practice in India, it is possible that palliative care in India relies on familial support rather than medical intervention as found more commonly in Western practices.

Hysterectomy in India: Prevalence and Contributing Factors
Bethany Jowers
Faculty Mentor: Holly Donahue Singh (Judy Genshaft Honors College)

Hysterectomies have been performed internationally for thousands of years, and have evolved immensely to provide better outcomes for the individuals who undergo them. Since their known inception in 120 C.E. until around the 20th century, it was rare for patients to survive hysterectomies due to abdominal inflammation, exhaustion from the grueling surgery, and the ever-present threat of sepsis, as well as a number of other post-operative complications resulting from unmodernized medical techniques and a general mistreatment of female-bodied invalids. In the last century, hysterectomies have become safer and therefore widely available as an important medical intervention, but there remains much to be explored about their sociocultural context in different regions of the world. This research project aims to synthesize information from various sources to convey the socioeconomic and cultural trends in populations of hysterectomized individuals in India. This project provides background information on Indian reproductive healthcare as well as consolidates and interprets data regarding the driving forces behind individuals’ decisions to undergo hysterectomies in India. The content of this project was gathered using secondary research techniques, including the survey of articles from multiple research journals. The data is presented using a poster format for easy visualization of the trends discovered during research, and is intended to provide a basis for more complex interpretation of the phenomena involved in hysterectomies in India.

Socioeconomic Analysis of Non-Fatal Gushot Wound Patients in the Emergency Department
Benjamin Kailes; Apoorva Ravichandran, BS; Rebecca Haber, BA; Alfredo Ortega-Cotte, BS; Emily Holbrook, MA; Roberta Baer, PhD; Jason Wilson, MD, MA, FACEP
Faculty Mentor: Jason Wilson (College of Medicine)

The majority of gunshot wound (GSW) injuries are non-fatal, yet GSW fatalities are mostly highlighted by public media (Magee et al., 2021). GSW survivors experience medical costs, postliminary emergency department (ED) admissions, medical management, and both physical and mental issues derived from injury. Mixed-method interviews of ED GSW survivors collected by this study serve to investigate themes able to inform proceedings of intervention to decrease firearm injuries, as well as update population-level data. Utilizing the electronic medical record, acute (aGSW) or previous GSW (pGSW) patients at Tampa General Hospital ED were identified. A focus on GSW-related hassles and patient experiences guided the conduct of qualitative, open-ended interviews with enrolled participants. Analysis of interview responses utilized coding and thematic analysis. 92 patients were interviewed (58% aGSW, 42% pGSW). 84% of GSW patients were unemployed (48%) or blue/pink-collar workers (36%). 59% of participants were black and most likely to be unemployed (45%) or blue/pink collar (35%). Hispanics (17%) reported mostly as blue/pink collar (50%) or unemployed (44%). Whites (20%) reported mostly as unemployed (63%) or blue/pink collar (25%). Minorities were more likely to report concerns to pay medical bills than whites. Healthcare disparities are demonstrated between census code. Future policy should be informed by patient level data to ensure more equitable healthcare treatment for GSW survivors and effective policies for firearm injury prevention.
Homeland Security in a Clinical Setting
Rachel Kline
Faculty Mentor: Arman Mahmoudian (College of Arts and Sciences, Interdisciplinary Global Studies)

Many threats exist in the clinical setting, a place primarily known for healing and restoring health. The wide range of threats include cybersecurity risks, natural disasters, physical or verbal violence, bioterrorism threats, and diseases that have the potential to cause an epidemic or pandemic. In the process of writing this paper, I reviewed various articles from sources which ranged from news articles to research journals. I began with reviewing research articles to learn about the specific disaster mitigation policies in place and then moved to news articles to show how these policies, or failure of these policies, impacts everyday life. I feel that this is an important topic to discuss because it is not widely discussed in the medical community. We practice with the guidelines and security measures in place, but often do not look at the entire system outside of the role that the individual provider plays. As a practicing healthcare professional, it is paramount to understand the origin and modification of the safety measures that are in place. This literature review explores each of these security threats and discusses measures or policies in place to mitigate these threats while protecting the safety of healthcare workers, hospital staff, patients, and visitors alike.

Using Morning Meetings to Build Young Children’s Perseverance
Sadie Koch
Faculty Mentor: Jolyn Blank (College of Education, Curriculum, Instruction and Learning)

The National Association for the Education of Young Children emphasizes the importance of creating a caring community of learners in early childhood education (PreK-grade 3) classrooms in order to support children’s willingness to take risks, try new things, and persist when engaging in challenging tasks. Young learners in particular need help developing skills to cope with new academic challenges presented to them in school contexts. However, sometimes children struggle to overcome these challenges because they have not fully developed their problem-solving and self-regulation skills. Previous research found that when classrooms had a consistent morning meeting routine, children were more likely to try different problem-solving strategies before requesting teacher assistance and were more focused during academic periods. The purpose of this study was to investigate whether morning meetings helped students persevere through challenges they experience during math and science lessons and activities. This study was conducted in a kindergarten classroom. Data sources included anecdotal records and transcripts developed from audio/video recordings of morning meetings and classroom activities, and student work samples. I expect to find there are relationships between the students’ participation in morning meetings and their perseverance in math and science instruction times. This study is important because it shows how using morning meetings can help current or aspiring teachers build positive classroom communities in order to foster children’s perseverance.
The Source of Bias: How University Students’ Primary Source of Information Impacts COVID-19 Attitudes and Behavior.
Macy Veronica Kuhn, Nicole Nagib, Juliana Catherine Rendle, Natalie Nagib
Faculty Mentor: Donna Lee Ettel-Gambino (Judy Genshaft Honors College)

Evidence suggests that students’ primary source of information during the COVID-19 pandemic may influence their attitudes and whether or not they complied with CDC guidelines. The purpose of this study is to examine the relationship between students’ primary source of COVID-19 information and their level of precaution. A causal comparative approach was utilized. A multivariate analysis of variance was conducted using SAS 9.4 (Cary, NC). The independent variable was the students’ primary source of information. The dependent variables included adherence to CDC guidelines via; 1) hand hygiene; 2) mask compliance; 3) physical distancing; 4) students testing positive for COVID-19; 5) vaccination status; and 6) booster status. This study indicates three statistically significant findings. (1) The proportion of students (95%) who reported hand washing for at least 20 seconds (p<0.03); (2) the proportion of students (96%) who agreed with avoiding contact with those who have tested positive (p<0.0001); (3) the proportion of students (66%) wearing a mask outdoors (p<0.04). Findings suggest that students’ primary source for obtaining COVID-19 information can impact COVID-19-related behaviors. It’s noteworthy that only 43% of students considered the CDC as their primary platform. Of those, they were more likely to comply with masking outdoors, avoiding close contact with positive individuals, physical distancing, and receiving the COVID-19 booster. This study highlights the importance of the source used to seek COVID-19 information as it relates to precautions taken. As misinformation circulates the internet, it’s crucial to ensure that the public is aware of where to find reliable COVID-19 recommendations.

Observations Involving Demographic Disparities Within Community Based Referral of NAFLD Patients
Daniel Kurtz Jr and Nicolette Kulcsar
Faculty Mentor: Guy Neff (Covenant Research)

NAFLD has presently resulted into a healthcare crisis, with >40% of the US population suffering from NAFLD. People suffering from NAFLD may have liver-based inflammation, also known as, non-alcoholic steatohepatitis (NASH) or a non-inflammatory pathway non-alcoholic fatty liver (NAFL). Rarely does NAFLD lead to symptoms until the disease has progressed to cirrhosis, thus early diagnosis is critical to survival. The aim of the project is to identify trends involving referral patterns, diagnostic modalities, and Echosens FibroScan testing related to NAFLD patients. Data was collected from referred NAFLD patients and analyzed based on gender, ethnicity, hip and waist circumference, BMI, and various lab values. The patients were analyzed on their attendance compliance and qualification status. Data collected showed 395 referred patients. 97 (24.6%) qualified for the trial screening and 175 did not qualify, with the remaining being either non-compliant with their visit or considered to have normal results. Of the 175 patients who did not qualify, 75 (19.0%) did not qualify due to kPa requirements, 63 (15.9%) did not qualify for other exclusions, and 32 (8.1%) did not qualify due to concomitant medications (CM), and 5 (1.3%) did not qualify due to both CM and kPa requirements. Overall referrals, 49 (12.4%) patients were non-compliant with referral visits, while 74 (18.7%) patients were deemed to have normal laboratory and Echosens FibroScan results. The primary disqualifying factor from NAFLD trials was current CM: either more time needed to acclimate to their medication and meet protocol criteria, or the medication was prohibited by the study altogether. In term of ethnicity, every ethnicity presented similar BMIs and HbA1cs throughout with an
The overall average of 33.2kg/m² (n=395) and 6.5% (n=395), respectively. Continuing, all patients had a degree of transaminitis within the sample being collected. However, White and Caucasians had the highest average CAP score and kPa on Echosens FibroScan.

Conclusions: The above data reveals a large percentage of patients referred for NAFLD management do not meet criteria or do not comply with referral. This data is important and will guide our efforts to better understand referral processes and education gaps while improving research opportunities for patients suffering from NAFL or NASH.

Optimizing Formyl-CoA Elongation Pathways for Methanol to Glycolate Bioconversion
Nathan Lanclos, April Johns
Faculty Mentor: Ramon Gonzalez (College of Engineering, Chemical, Biological and Materials Engineering)

The impact of one-carbon (C1) compounds associated with climate change and their relative ubiquity in the environment has made them ideal targets for modern metabolic engineering efforts. C1 activation pathways from methanol are particularly attractive since they offer cheaper alternatives to construct intermediates for C1 elongation. Industrially relevant microorganisms fail to express pathways capable of methanol metabolism, and therefore, the development of methylotrophic host systems represents an important goal and critical challenge for applications in generating industrial C1-based products. Recently, a pathway in E. coli based on iterative formyl-CoA elongation (FORCE) has demonstrated orthogonal methanol to glycolate bioconversion using Methanol Dehydrogenase (MDH), Acetyl-CoA Reductase (ACR), 2 Hydroxyacyl-CoA Synthase (HACS), and CoA-Transferase (AbfT). This work aims to characterize improvements to the production of glycolate from methanol utilizing previously demonstrated FORCE pathways by exploring computational enzyme bioprospecting and optimizing titer via control of relative gene expression and engineering of competing pathways.

Exploring Multiple Pathways to Reading: A Teacher Inquiry
Julia Bissonnette and Sarai Marquez
Faculty Mentor: Jolyn Blank (College of Education, Curriculum, Instruction and Learning)

The National Council of Teachers of English (2019) recommends teachers use multiple instructional formats to teach reading (e.g., shared reading, guided reading, explicit skills instruction, individualized instruction). Their position statement on teaching reading highlights the need for teachers to reflect upon the teaching strategies they utilize in their efforts to improve children’s reading fluency and comprehension. As early childhood educators working in two neighboring first-grade classrooms, we were curious how our students responded to the various reading strategies we employed. The purpose of this study was to understand how these strategies affected student growth in reading fluency and comprehension. To examine how our students were learning to read, we documented small group reading instruction in our classrooms. Data were collected over a period of six weeks. Data sources included audio-recordings of dialogue during small group reading lessons, reading assessments such as running records, student work samples, and teacher journals. We expect to find our close observations of students’ engagement in a variety of forms of reading instruction will provide insights into the ways students respond to various strategies, and inform our instructional responses in ways that build upon their strengths as readers. Describing students’ responses to various strategies and illustrating the ways we engaged in multiple forms of instruction will provide insight into the complexity of teaching reading. Children’s early experiences with reading instruction are crucial to not only help them build foundational skills but also strengthen their disposition to see themselves as life-long readers.
Cadmium Regulates Mitochondrial Dynamics Through Drp1 Expression
Ally McMillen
Faculty Mentor: Narasaiah Kolliputi (Morsani College of Medicine, Family Medicine)

Cadmium (Cd) is an environmental toxin that enters the body through foods and cigarette smoke. Its undesirable effects target the kidney, bone, vasculature, and lungs. Cd, recognized as a carcinogen, impacts cell functionality by changes in gene expression and signal transduction. Mitochondria are known as the powerhouse of the cell and play a critical role in biogenetics and metabolism. However, the effects of Cd on mitochondrial proteins are not well understood. In this study, we explored the mitochondrial signaling pathways affected by Cd in RAW cells. Cadmium chloride (CdCl2) toxicity was assessed in RAW 264.7 cells with Trypan blue staining and a subtoxic concentration of CdCl2 was determined. Cells were imaged using a light microscope. RAW 264.7 macrophage cells were exposed to 5, 10, and 15 μM CdCl2 for 24 hours. Whole-cell lysate was collected, and blots were probed using mitochondrial markers such as Drp1, pDrp1, Bax, and Bcl-2. β-actin was used as a loading control. Western blot analysis revealed a decrease in the expression of the mitochondrial fission protein, Drp1 (Dynamin-related protein 1). Interestingly, the phosphorylated Drp1 (p-Drp1, S637) increased significantly in a dose-dependent manner in cadmium (Cd) treated RAW cells. The pro-apoptotic protein, Bax, showed a higher level in Cd-treated cells related to control. The anti-apoptotic protein, Bcl-2, was significantly decreased in Cd-treated cells versus control. The data shows that the mitochondrial dynamics are affected in Cd treated RAW cells.

Politics & Prevention: How Party Affiliation Impacts COVID-19 Compliance
Kaylie Miller, Cathryn Pendleton, Juliana Catherine Rendle, Natalie Nagib
Faculty Mentor: Donna Lee Ettel-Gambino (Judy Genshaft Honors College)

Studies suggest that the precautions people take to protect themselves against COVID-19 may vary due to their political party affiliation. This study aims to understand whether political party affiliation has influence on the behavior of college students and their compliance with COVID-19 policies as set by the CDC. A causal comparative approach was utilized. A multivariate analysis of variance was conducted. The independent variable was political party affiliation. The dependent variables were whether or not one agrees that the vaccine protects against the Omicron variant, that COVID is spread through direct contact, that handwashing is important, that skin contact should be avoided, that contact with infected individuals should be minimized, and that one would isolate should they have symptoms. This study resulted in two statistically significant findings. (1) The proportion of students (83.7%) who feel that the vaccines offer protection against the Omicron variant of COVID-19 (p<0.02); and (2) the proportion of students (96.8%) who would self isolate if they found out that they had been exposed to/infected with COVID-19, or had any symptoms of an acute respiratory infection like cough, fever, sore throat or runny nose. (p<0.01). The results show that liberals were most likely to feel that the vaccine offered protection as well as to self isolate should they have exposure to COVID-19 or any other symptoms. Liberals may have greater roles in preventing the spread of COVID-19 as they have shown to take greater preventative measures.
Comparing Depression Scales and Their Ability to Predict Cognitive Function
Kerri Murphy, Jude T. Sullivan, Nasreen A. Sadeq
Faculty Mentor: Nasreen Sadeq (College of Behavioral and Community Sciences, Aging Studies)

Through our ongoing research, we seek to identify early indicators of cognitive change in individuals sixty years of age and older. We are particularly interested in the relationship between depression questionnaires and learning, attention, memory, spatial problem solving, and executive functioning assessed by the Cogstats computerized cognitive battery. The Geriatric Depression Scale, Beck’s Depression Inventory, and the Center of Epidemiological Studies Depression Scale questionnaires are administered every six months to gauge depressive symptoms. During the same six-month visit, participants complete various Cogstats assessments encompassing identification, detection, and memory playing card related tasks, numerous Groton Maze learning tasks and a recall task, and memorization and a delayed recall of the International Shopping List Test. Through our preliminary data analysis, we have identified significant correlations between each depression score and all the Groton Maze tests, especially during the first trial. Significant relationships, and trends toward significance, were recognized for all four trials of the International Shopping List Tests and the three depression measures, as well as the speed of completion of One Card Back and the Geriatric Depression Scale. Data collection is ongoing and will be re-analyzed to confirm whether these findings extend to the final study sample.

Problematic Politics: How Political Affiliation Influences Compliance with COVID-19 Guidelines
Nicole Nagib, Macy Kuhn, Natalie Nagib, Juliana Catherine Rendle
Faculty Mentor: Donna Lee Ettel-Gambino (Judy Genshaft Honors College)

Despite the national push over students’ behaviors during the COVID-19 pandemic, previous literature indicates that political affiliation may influence behavior. This study aims to examine differences among students’ political affiliation and their compliance with CDC guidelines. A causal-comparative approach was utilized. A MANOVA was conducted using SAS 9.4 (Cary, NC). The independent variable was the political party students identified with. The dependent variables included adherence to CDC guidelines: 1) hand hygiene; 2) mask compliance; 3) physical distancing; 4) positive COVID-19 result; 5) vaccination status; and 6) booster status. This study identified five statistically significant findings. (1) The proportion of students (93%) who reported wearing a mask indoors (p<0.0001); (2) the proportion of students (66%) who reported wearing a mask outdoors (p<0.0001); (3) the proportion of students (60%) who reported physically distancing in groups (p<0.009); (4) the proportion of students (89%) who reported receiving the full dosage of the vaccine (p<0.0001); (5) the proportion of students (47%) who reported receiving a booster immunization (p<0.0001). Findings showed that students who identified themselves as liberal were more likely to be fully vaccinated/receive the booster compared to their conservative counterparts. Conservative students were less likely to wear a mask indoors and outdoors as opposed to their liberal cohorts. Additionally, more liberal students reported social distancing while in large groups. This study highlights the importance of political dialogue in furthering public health and individual well-being. It demonstrates the importance of leveraging political policies and conversations in the interest of improved quality of health and life.
An Analysis and Outcomes Report Involving Prescreening Protocol Adjustments in a NASH (Non-Alcoholic Steatohepatitis) Population

Anna H.T. Nguyen, Jovanna M. Arce
Faculty Mentor: Guy Neff (Covenant Research)

NASH clinical trial screenings are wrought with unpredictable barriers to randomization. Herein, we communicate the results of institutional adjustments to screening criteria in order to further distinguish the less NASH-endemic cross-sections of the population from those populations for which consensus labels “high-risk.” Current global analyses reveal that less than ten percent of trial candidates achieve randomization; the vast majority of attrition derived from those deemed “high-risk.” This exposes a fundamental misattribution established by the current analytic epidemiology of NASH. To pinpoint the absolute lower limits of the disease state, we instituted increased screening thresholds in three biomarkers determined as crucial in NASH patient identification.

Social Disparities in Inflammatory Biomarkers Mediated by Poor Sleep Quality

Joseph Obiagwu, Christina Mu, B.A., Soomi Lee, Ph.D.
Faculty Mentor: Soomi Lee (College of Behavioral and Community Sciences, Aging Studies)

Black individuals and those with lower socioeconomic status (SES) have higher risks for systemic inflammation. Few studies have examined the potential mediating mechanisms between race/SES and inflammatory biomarkers. This study investigated whether sleep quality mediates the relationship between race/SES and inflammatory biomarkers. Data came from 784 adults (Mage=53.02) who participated in the Midlife in the United States Study. The Pittsburgh Sleep Quality Index measured global sleep quality. SES was measured based on eight indicators of life-course factors (e.g., education, subjective financial level, household income-to-poverty ratio). Inflammatory biomarkers (C-reactive protein, CRP; Interleukin-6, IL6; Interleukin-10, IL10; Tumor Necrosis Factor Alpha, TNF-α) were collected via blood samples. Process Macro in SAS was used to examine mediation effects. Black individuals and those with lower SES experienced worse sleep quality and higher inflammatory levels compared to non-Hispanic white and those with higher SES, respectively. Poorer sleep quality mediated the relationship between being Black and higher levels of IL6 ($\beta=0.03; \text{SE}=0.02; 95\% \text{ CI}[0.01, 0.06]$), CRP ($\beta=0.04; \text{SE}=0.02; 95\% \text{ CI}(0.005, 0.09)$), and TNF-α ($\beta=-0.01; \text{SE}=0.01; 95\% \text{ CI}[-0.02, -0.0006]$). Poorer sleep quality also mediated the relationship between being in lower SES and higher levels of CRP ($\beta=-0.01; \text{SE}=0.00; 95\% \text{ CI}[-0.02, -0.0006]$), IL6 ($\beta=-0.005; \text{SE}=0.00; 95\% \text{ CI}[-0.02, -0.0006]$), and TNF-α ($\beta=-0.002; \text{SE}=0.001; 95\% \text{ CI}[-0.01, -0.0001]$). Sleep did not mediate the relationship between race/SES and IL10. Improving sleep quality may help reduce the risk of systemic inflammation in Black individuals and those with lower SES, and subsequently reduce health disparities.

Fostering Young Children’s Social Competencies

Shannon OBrien, Allexyss Sisouphone
Faculty Mentor: Jolyn Blank (College of Education, Curriculum, Instruction and Learning)

Children can benefit from direct instruction and scaffolding of classroom behaviors much like they would in other academic areas. Research suggests teachers of young children frequently lack the strategies required to effectively interpret and respond
to behaviors that challenge them. The purpose of this study is to implement strategies that can foster and promote social competence in children in order to encourage more positive classroom behaviors. This study took place in a kindergarten and a first-grade classroom at the same school. Data sources included classroom observation (anecdotal records and observation checklists), transcriptions of audio recordings, and photographs. We expect to find that utilizing intentional teaching strategies targeted to develop children’s social competencies will support their learning in the classroom. Promoting social competence in young children is important for all teachers as it encourages an overall more successful school experience.

Role of L vs. D \( \beta \)-hydroxybutyrate on Anti-Cancer Treatment
Zena Omer
Faculty Mentor: Dominic D’Agostino (Morsani College of Medicine, Molecular Pharmacology & Physiology)

\( \beta \)-hydroxybutyrate (BHB) a chemical found in the body that supplies cells with energy when there is a decrease in glucose production from periods of fasting or decrease in carbohydrates. Glucose is needed to produce ATP for cellular function, cancer cells depend on glucose in order to grow, however cancer cells require larger quantities of glucose. There are two forms of BHB the enantiomers L-BHB and D-BHB, the body produces D-BHB in high amounts enters the blood and converts into energy. Little knowledge is known about L-BHB. As a result, this experiment is meant to utilize L-BHB on U87 cells and compare its data to D-BHB to analyze the difference between the two. To test this, materials are the cell culture media used are U87 cells, L and D BHB Treatments, the glucose controls, and Hemocytometer as a method of cell counting. The U87 cells will be placed on plate to grow until confluency is reached. The cell will be transferred to 6 well cell plate, with seating number of 15,000 cells. After incubating the plate, feeding the cells for a week the cells will be collected placing solution in Eppendorf tube, adding trypan blue, and placing solution in hemocytometer. Counting all live and dead cells for each well and determining the difference between D vs. L \( \beta \)-hydroxybutyrate and its ability to control the cancer cells. The observations and data collected for this experiment will serve as a pilot trial that will be modified for future experimentations.

The Impact of Pandemics on the Incidence of Seasonal Influenza: CoVID-19 Compared to 2009 Swine-Origin Influenza
Molly Orlick, Rejoy Sabin Thomas
Faculty Mentor: Steven Specter (Morsani College of Medicine, Family Medicine)

The CoVID-19 pandemic led to the implementation of rigorous health measures. Actions that aim to minimize SARS-CoV-2 transmission may help prevent seasonal influenza transmission. Influenza cases were hypothesized to be lower than previous seasons among the James A. Haley Veterans’ (JAHVA) Hospital population from fiscal years 2017-2021. A decrease in seasonal influenza cases was hypothesized during the 2009 swine-origin influenza pandemic. Influenza vaccination rates decreased by 43% in 2021, Influenza diagnoses, positive tests, and medication prescriptions declined by >94% compared to the JAHVA 2020 influenza season. Data from the Centers for Disease Control and Prevention revealed a decrease in seasonal influenza in 2010 and 2021. Declining trends of seasonal influenza after 2009 are similar to trends during the CoVID-19 pandemic. The reduced prevalence of seasonal influenza during the pandemics indicates the benefits of public health interventions in decreasing respiratory viral transmission, specifically mask-wearing, increased hand-washing, and self-isolation during an illness.
Cadmium Treatment Induces Oxidative Phosphorylation (OXPHOS)
Indu Parameswaran
Faculty Mentor: Narasaiah Kolliputi (Morsani College of Medicine, Family Medicine)

Cadmium is a toxic pollutant, and humans are exposed to cadmium by smoking cigarettes. Its effect on mitochondrial OXPHOS is unknown in RAW cells. RAW cells were exposed to various concentrations of CdCl2 for 24 h. Cell toxicity was determined. RAW cells were treated with CdCl2 (5µM, 10µM, 15µM) for 24h and subjected to Western blot using OXPHOS, HO-1, and SOD2. Flow cytometry was performed to assess pyroptosis. A concentration of 25µM Cd induced 50% of cell death. OXPHOS complexes (I-V) expression was higher in Cd-treated cells than in control. Flow cytometry analysis revealed an increase in pyroptosis in Cd-treated cells. SOD2, mitochondrial superoxide dismutase, expression increased with Cd treatment. Heme oxygenase 1 (HO-1) expression increased at low concentrations and decreased at higher concentrations of Cd. The data suggest that Cd induces pyroptosis, oxidative stress and affects OXPHOS complex expression in RAW cells.

COVID-19 Around the World: Does Ethnicity Influence Prevention Practices and Beliefs?
Yash Nilesh Patel, Isaac Charles Hernandez, Juliana Catherine Rendle, and Natalie Nagib
Faculty Mentor: Donna Lee Ettel-Gambino (Judy Genshaft Honors College)

Previous research has suggested that COVID-19 continues to remain a major public health threat despite of race or ethnicity. However, individuals from unique ethnic background vary in behaviors, health profiles, and risks. Therefore, the following study was conducted to better understand the relationship between ethnicity and certain COVID-19 related beliefs and practices, amongst collegiate students. A causal comparative approach was utilized. A multi-variance analysis of variance was conducted utilizing SAS 9.4 (Cary, NC). The independent variable was the students’ ethnicity. The dependent variables were 1) student compliance with hand-washing; 2) avoiding close contact with infected individuals; 3) wearing masks indoors; 4) wearing masks outdoors; 5) maintaining physical distancing; 6) opinion on vaccine protection against omicron; and 7) whether individuals were fully vaccinated. The study resulted in three statistically significant findings: 1) the proportion of students (96%) who reported frequently washing their hands thoroughly to protect themselves (p<0.04; 2) the proportion of students (66%) who reported wearing masks outdoors (p<0.02); and 3) the proportion of students (90%) who reported being fully vaccinated (p<0.01). Encouraging all students to comply with the guidelines set forth by the CDC may help minimize any ethnic inequalities and enhance healthcare for all. While most students practice COVID-19 protection measures, there are ethnic disparities among certain behaviors. The findings and information from the study may help university administrators make informed decisions and look to implement new prevention strategies that will help maximize COVID-19 guideline compliance and minimize the spread of the virus, amongst the entire student population.

Examining the Male/Female Ratio in Nepal
Yash Patel
Faculty Mentor: Holly Donahue Singh (Judy Genshaft Honors College)

The male/female ratio represents the proportion between the number of males and the number of females within a specific region. In South Asian countries, there exists a general preference for males over females. This has resulted in a skewed male/
female ratio (greater than 1) for several years. Here, the author examines data regarding the male/female ratio in Nepal. Data on the number of births and deaths (segregated by sex) will be utilized to provide evidence for the obtained ratio. Finally, data regarding the residence of the 2 sexes in urban and rural settings will be used to explain differences of the ratio in the context of socioeconomic status. Data on employment of the 2 sexes in blue-collar and white-collar occupations will also be used to examine the differences as it pertains to socioeconomic status. This research aims to examine trends that may appear between the male/female ratio and the socioeconomic status indicators mentioned. Potential causative agents may be identified, depending on the strength of the trends observed.

Creating Eye Health Awareness in Students: Developing a Teaching Curriculum and Educating Elementary School Children
Vrunda Patel
Faculty Mentor: Nana Tuntiya (College of Arts and Sciences, Sociology)

Our eyes play an essential role in helping us perceive the world around us. The eyes are the window to our bodily health and eye exams can reveal various health conditions. Due to the changes in children’s lifestyles, eye conditions, such as nearsightedness and eye discomfort are becoming more prevalent. Vision is significantly associated with academic success as children need many vision skills to read and learn effectively. Consequently, it is important for us to start taking care of our eyes at a young age and practice good eye health to optimize the function of our eyes in the long run. This project aims to educate children about eye health by utilizing appealing, informative, and impactful teaching material. The information learned from the critical literature review was condensed into a child friendly presentation and the students were taught the importance of the eyes, structure of the eyes, and good eye health practices. The students were extremely interested asking numerous questions after each slide and were very responsive to the activities. It is evident that there is a need and a want for increased eye health awareness, and we must find more ways to deliver. This project to raise eye health awareness among elementary school students not only encourages them to practice good eye health and increases the chances of implementation as they grow older, but it also helps to increases their health literacy resulting in more competence in health decision making and improved health outcomes in the future.

Women’s Empowerment and Leadership (WEL) Institute: Refugee Pilot Program on Food Security and Advocacy
Katherine Patino, Ca Hoang
Faculty Mentor: Elizabeth Dunn (College of Public Health)

Since the passage of the 1980 Refugee Act, more than 3.1 million refugees have been admitted to the United States with 3,071 resettled in Hillsborough and Pinellas Counties in 2021. Resettled refugees face numerous challenges, from ensuring housing, obtaining income, to accessing appropriate and nutritious food. However, there are few programs available to empower refugee women and equip them with resources to overcome challenges they face. The goal of this program evaluation is to assess the experiences of the refugee women during the piloting of a new refugee empowerment program. Throughout a six-week course, undergraduate students met with refugee women and community leaders to host the first Women’s Empowerment and Leadership (WEL) Institute focusing on food security and advocacy. The refugee women were able to learn about the local food system and volunteer in the community. Students used qualitative methods to evaluate their experiences and learn more about
their journey via field notes, asset mapping, journey mapping, storytelling, and photo voice methodology. The evaluation within the pilot program provided insights on the gaps in food security within the refugee population. The pilot program was overall well-received by both the participants and the students involved, with many expressing an interest in continuing the program for recently resettled refugee women. Insights from discussions with the target population show that additional topic areas would be of interest for the WEL Institute including language support, financial freedom, addressing barriers to healthcare, and accessible transportation.

Effects of UBE3A Gene Therapy in a Mouse Model of Tauopathy
Jazmin Pena, Aurelie Joly-Amado, Kevin Nash
Faculty Mentor: Aurelie Joly-Amado (Morsani College of Medicine, Molecular Pharmacology & Physiology)

Alzheimer’s disease (AD) is a neurodegenerative disease that involves the accumulation of A-Beta proteins and Tau proteins within the brain and leads to cognitive impairments. Accumulation of these proteins can occur in various parts of the brain, causing a decline in synaptic plasticity. Ubiquitin ligase 3A (UBE3A) has been shown to increase synaptic plasticity. The aim of this study was to test if long term overexpression of UBE3A in the brain through gene therapy in a mouse model of tauopathy, Tg4510 mice, could rescue cognitive deficits and decrease pathology. 3-month-old Tg4510 and non-transgenic mice were injected in the hippocampus and cortex with AAV9-GFP or AAV9-UBE3A. Behavior testing was performed after 2 months of viral expression. Tissue was then collected after 5 and a half months of age to assess pathology.

House of Cards: How COVID-19 Housing Affects the DECK
Cathryn Joice Pendleton, Kaylie Michelle Miller, Natalie Nagib, Juliana Catherine Rendle
Faculty Mentor: Donna Lee Ettel-Gambino (Judy Genshaft Honors College)

High vaccination rates are vital to create herd immunity, especially in young adults since they have the highest incidence rates. It is essential students understand CDC protocols and the importance of the vaccine. This study aimed to determine if young adults adhere to COVID-19 protocols and how their living arrangement affects their behavior. A causal comparative approach was utilized. A multi-variance analysis of variance was conducted utilizing SAS 9.4 (Cary, North Carolina). The independent variable was the students’ housing arrangement. The dependent variables were [1] belief in protection against Omicron with the vaccine; [2] agreement with COVID-19’s mode of transmission; [3] residing with an immunocompromised individual(s); [4] hand-washing for a minimum of 20 seconds; [5] avoid touching their face; [6] social distancing of at least 6 feet and [7] self-isolation when ill. The findings of this study identified that there were three significant findings. [1] The proportion of students (84%) who believed the vaccine protected them against Omicron variant (p<0.03); [2] the proportion of students (72%) who believed in the mode of COVID-19’s transmission (p<0.04); and [3] the proportion of students (96%) who live with someone who is immunocompromised (p<0.04). The results may be leveraged to incorporate a public policy change in equity regarding the housing arrangements for students. These changes are critical to ensure that college students understand the importance of following the CDC’s protocols surrounding COVID-19 mitigation. Further research may be conducted to determine what colleges/universities are doing to ensure the students’ compliance with COVID-19’s guidelines on campus.
US Drug Policy Impact on Minorities
Ohemaa Peprah-Asante, Kimberly Johnson
Faculty Mentor: Kimberly Johnson (College of Behavioral and Community Sciences, Mental Health Law and Policy)

Race has a significant impact on the way that justice systems treat offenders. From laws that target minorities to unequal enforcement, and unequal sentencing, law enforcement policy and practice regarding drug use are especially egregious. A literature review was conducted with the aim of investigating different effects of US drug policy on white offenders in comparison to other racial minorities, especially black populations. To investigate drug policy and its effect on the incarceration rate according to race in America, I searched the following academic databases: PubMed, PsycINFO, JSTOR, Sage Pub, and ResearchGate. I also searched the Internet for peer-reviewed scientific studies presenting original data to May 5th, 2021. The primary outcome of interest was the differing effects that the US drug policy has on different races. Secondary outcome of interest was avenues to reduce racism through drug policy. The 19 studies determined to be relevant provided evidence of significant racial bias in drug policy and law enforcement practice. From laws that target minorities, like the differential sentencing requirements for powder and crack cocaine, to law enforcement programs that deliberately target black populations through over-policing in minority neighborhoods and over-incarcerating minority offenders compared to whites, the system is biased. By understanding the various ways that US drug policy is organized to benefit white people and harms people of color, solutions can be introduced to the public and/or the government to change policy and practice that places more importance on equity.

How Poor Self-Perception Feeds into Harmful Self-Handicapping Behaviors
Angela Perez Cruz
Faculty Mentor: Cayla Lanier (Judy Genshaft Honors College)

Although humans have always suffered from self-handicapping behaviors, they have not always been properly understood. There are countless studies about how self-handicapping behaviors affect productivity (both in the workplace and in school), the factors that contribute to self-handicapping behaviors, as well as the possible solutions to such an inescapable blight. This paper aims to explore some of the many factors that contribute to the prevalence of self-handicapping behaviors, particularly in an advanced academic context, and how they can be evaded in favor of academic success. The central claim of this paper is that poor self-perception of one’s intelligence, ability to self-regulate, and self-efficacy (among other facets of one’s productivity or perceived academic value) will result in an increased reliance on self-handicapping behaviors as a means to avoid or stall confronting one’s perceived deficits. Towards the end of this paper, there will be alternative mindsets presented that could resolve issues of poor self-perception by shifting the focus from a student’s intelligence or academic performance to their intellectual journey as a learner rather than a letter grade as well as further research proposals.
For Richer or Poorer in Sickness and Health: Socioeconomic Status and its Effect on Students’ Attitudes and Behavior During COVID-19
Alyssa Mae Perez Ulgasan and Sana Saeedah Baban
Faculty Mentor: Donna Lee Ettel-Gambino (Judy Genshaft Honors College)

A previous study suggested that despite travel restrictions becoming more lenient, people with higher socioeconomic status (SES) traveled more frequently than those who identified with a lower SES. This study aimed to examine difference among students with different SES backgrounds and their knowledge and behaviors during the COVID-19 pandemic. Causal comparative approach was utilized; MANOVA was conducted using SAS. The independent variable was SES; dependent variables include (1) agreement with CDC guidelines (2) change in behavior in accordance to online COVID-19 information (3) concern about Omicron (4) agreement that vaccine offers protection against Omicron (5) knowledge of COVID-related death (6) willingness to share symptoms (7) willingness to isolate if they tested positive (8) travel by plane (9) change in mental health. There were four statistically significant findings: the proportion of (1) students (13%) who would conceal if experiencing symptoms (p<0.03) (2) students (72%) concerned about Omicron (p<0.02) (3) students (81%) willing to change behaviors based on online COVID-19 information (p<0.03) (4) students (39%) who have traveled by plane (p<0.004). Results suggested lower class (LC) and upper class (UC) students would conceal if they experienced symptoms, but UC students worry the least about Omicron whereas lower middle class (LMC) students worry the most. LC and LMC students would change their behavior based on online COVID-19 information. Contrary to the aforementioned study, LC and LMC students traveled the same if not more than UC students. These results implore for a call to action to bridge the gap among socioeconomic disparities intertwined with healthcare disparities.

Devastating Inequalities in South Asian Healthcare
Isaac Powell
Faculty Mentor: Holly Donahue Singh (Judy Genshaft Honors College)

Healthcare in South Asia is filled with toxicity towards its own people. A functional healthcare system provides quality services for all, disregarding any differences in identity and socioeconomic status. In South Asia, however, these identifications cause many people to be harshly discriminated against in daily life and while seeking out adequate healthcare. For women in South Asia with a lower socioeconomic status (or low caste), these discriminations become extreme. The costs of medications and treatments in South Asia are expensive, and vast differences between economic levels compounds with cost to outright prevent many from being able to afford needed healing. As women are more heavily discriminated against than men, this effect only becomes worse for destitute women. From being forced to give birth on bare hospital floors to suffering unnecessary health complications from harsh, underpaying labor, this project seeks to provide truthful insight into the health-related struggles faced by poor women in South Asia.
The Precursor to the Holocaust: Adolf Hitler’s Economic and Ethnic Persecution of the Disabled Community
Megan Proctor
Faculty Mentor: Darcie Fontaine (College of Arts and Sciences, History)

The murder and sterilization of disabled victims under the Third Reich, my paper will argue, was a significant precursor to the actions subsequently taken during the Holocaust. Grounded in both primary and secondary evidence, my paper analyzes Hitler’s economic and ethnic opinion of German’s disabled community and its legacies for other persecuted groups, including most notably the Jewish community. This research introduces a thesis that combines both ethical and economic persecution as exhibiting an intertwined relationship – thus filling a gap in literature. Hitler considered disabled individuals an economic “drain” because they were unable to work. He also believed that the mere existence of disabled individuals would threaten the nature of the Volksgemeinschaft, or the “pure” Aryan race. In response, Hitler passed the “Law for the Prevention of Genetically Diseased Offspring”, which succeeded in sterilizing many disabled individuals. Such views and policies, originally targeting disabled individuals were soon extended to the Jewish community throughout the Holocaust. To this day, the propaganda Hitler created to communicate his discriminatory economic and ethnic viewpoints of disabled people persist, now in the form of ableism. The persecution and murder of disabled victims under Adolf Hitler’s power, as I will explain, raises important ethical questions regarding the amount of power a state holds over disabled individuals in a conservatorship.

Using Universal Design for Learning to Increase Student Engagement.
Ragon Ralston, Melissa Bender
Faculty Mentor: Jolyn Blank (College of Education, Curriculum, Instruction and Learning)

In today’s classrooms there are a wide variety of student interests, needs, and abilities. Current research on Developmentally Appropriate Practice suggests that incorporating the principals of Universal Design for Learning (UDL) can help teachers bridge gaps in understanding and experience by providing students with multiple entry and exit points in each lesson. UDL is an approach used to meet students’ diverse learning needs in the classroom. The purpose of this study is to reflect on how implementing UDL teaching strategies into the current teacher-led math lessons will affect student engagement. Data sources included: student engagement frequency counts, video recordings, anecdotal records, and student artifacts. We expect to find higher levels of engagement among students who received targeted UDL teaching strategies. This study is important because it can help support all teachers in differentiating and accommodating for the diverse needs of today’s learners.

Encouraging Writing Development
Stephanie Randolph, Hope Todd
Faculty Mentor: Jolyn Blank (College of Education, Curriculum, Instruction and Learning)

Young writers frequently need guided practice in order to make connections between teachers’ demonstrations and their own writing. Previous research has found that emerging writers’ show growth when teachers engage in collaborative discussions with them about their writing, targeting and modeling specific strategies in the context of their own work. In this teacher inquiry, we explored the question: How can we support our student’s writing development? Data were collected in two first grade classrooms. Data sources included anecdotal records developed from observation of children’s classroom writing experiences, audio-
recordings of writing discussions, student writing samples, and informal interviews with students pertaining to their writing experiences. We expect to find that providing targeted support in the context of student’s writing, including providing them with opportunities to talk about their writing with peers and assess their own writing, will both improve their writing skills and increase their independence as writers. This study is important because it provides insights into what the processes of teaching and learning to write look like and identifies specific strategies teachers can use to provide a supportive context for writing development in early childhood classrooms.

FinTech: the Evolving Consumer Demand
Olivia Reller
Faculty Mentor: Jung Chul Park (Muma College of Business, Kate Tiedemann School of Business and Finance)

The objective of this research analysis is to explore the impact of Fintech disruptions within the financial services industry measuring the sentiment of consumers and how demand may change over time. This was achieved by preparing a cross-sectional survey that gauged the participant’s satisfaction of their experiences with new financial technologies. Also, a case study was conducted to evaluate the system changes that a boutique investment advisory firm has underwent due to the evolving Fintech landscape. It was determined that younger generations who have not yet obtained large income and net-worths were more likely to embrace technological change than their older, wealthier counterparts. Moreover, our case study revealed that even smaller firms are making substantial investments in Fintech changes in order to preemptively adapt to expected industry changes.

Healing Through Music: Music Therapy in Ayurvedic Medicine
Collin Reynolds
Faculty Mentor: Holly Donahue Singh (Judy Genshaft Honors College)

Ayurvedic medicine is a traditional, alternative form of non-Western medicine, that focuses on health and well-being. Music therapy, the use of music to heal one physically or emotionally, can be found as a source of healing in the Ayurvedic system. By synthesizing other sources, such as research, personal blogs, news, and books, the use of music therapy in Ayurvedic treatment and South Asian tradition is understood. Using the methods given previously, there will also be information regarding the interaction between music therapy in biomedicine and Ayurvedic medicine, and how the former influences the latter. Music therapy also having influence from other South Asian countries will be reviewed, as the healing practices and religious or ritual places of other related places have much comparative information to offer to the project. To handle and develop the materials related to music therapy within the context of South Asia and the context of Ayurvedic medicine can offer education to those in the medical field a new perspective on the ideas of music therapy, and those who are interested in understanding the concepts, applications, and effects of therapy on themselves or others.

Does Duration of Valenced Experiences Impact Affective and Evaluative Reactions?
Zoe Ritchotte, Reilly Orman, Sanjana Luthra, Marcus Cumberbatch, Jordan Martin, & Sandra L. Schneider
Faculty Mentor: Sandra Schneider-Wright (College of Arts and Sciences, Psychology)

The goal of this study is to understand how duration of positive and negative experiences can influence predicted emotions (i.e., affect) and evaluations of those experiences. The current research explores the association between the valence (i.e., positive or negative) of experiences, affect, and decision making by testing (1) whether affective feelings predict how much one is willing to
pay to experience positive or avoid negative hypothetical situations and (2) whether longer durations of positive experiences are treated differently than longer durations of negative experiences. The satiation-escalation hypothesis postulates that subjective responses to positive experiences tend to peak and plateau as positive experiences accumulate, whereas subjective responses to negative experiences tend to intensify as negative experiences accumulate. Study participants were randomly assigned to the positive or negative condition of an online experiment involving descriptions of eight scenarios presented in seven durations (e.g., spending 3 hours at a theme park). After each scenario, participants reported how much they would be willing to pay to engage in or avoid the experience, as well as rating how happy or upset they would feel about spending the time in that scenario. Results explore the strength of the relationship between affect and willingness to pay. They also show whether responses to positive events level off or satiate at longer durations and whether responses to negative events grow stronger or escalate at longer durations. The results will call attention to how one type of valence asymmetry can impact affective and evaluative reactions to experiences.

**Vaccination Trends in India: From the 19th Century to the Present**

Zainab Farooq, Jasmine Robins  
Faculty Mentor: Holly Donahue Singh (Judy Genshaft Honors College)

In 1803, a 3-year-old girl received what would be the first vaccination in India’s history. The vaccine was for smallpox, which had taken the world by storm. Considering the administration of the vaccine a success, the British Raj opted to switch from variolation to vaccination. Vaccination types started with smallpox, then typhoid fever, and continued to grow along with the course of India’s history until today with the emergence of the COVID-19 vaccination in its many forms. However, this sudden push to a new type of medicine could have been considered disruptive, taking people away from their traditional medicine and practices. As vaccines were considered Western medicine, the idea of them had mixed reviews amongst the population. Throughout the years, the production of vaccinations in India has improved a lot as India has recently quickly and efficiently rolled out vaccinations for the COVID-19 pandemic. Comparing and contrasting trends in vaccination statistics, developments, rules, and regulations from then and now can aid India and other countries in finding what worked and what didn’t to adjust for future decisions in law-making and scientific research. Making changes based on historical analysis is one of the best ways to avoid making the same mistakes in the future and help avoid making new ones. In this research project, we will explore vaccination trends in India starting from the first vaccines given in the 19th century to the current roll out of COVID-19 vaccines in today’s pandemic.

**Cadmium Activates NLRP3 Inflammasome-Mediated Pyroptosis in Murine Macrophage Cell Line RAW 264.7**

Caila Robinson  
Faculty Mentor: Narasaiah Kolliputi (Morsani College of Medicine, Family Medicine)

Cadmium (Cd) is an environmental toxin that affects the kidney, liver and lungs. Its effect on innate immunity is not well known. RAW 264.7 macrophage cells were treated with different concentrations of CdCl₂ (5, 10, 15 μM) for 24h. Whole cell lysate was prepared, and western blot analysis was carried out for NLRP3, Caspase-1, and Gasdermin D. To detect pyroptosis, RAW cells were treated with 5, 10, 15 μM of CdCl₂, and Nigericin (positive control) followed by staining with FLICA reagent and Confocal microscopy. Western blot analysis revealed a higher expression of NLRP3, Caspase-1 and Gasdermin D in RAW 264.7 cells.
treated with CdCl₂ relative to controls. Confocal imaging revealed an increased level of Caspase-1 activity in CdCl₂ treated cells relative to controls. The data shows that Cadmium induces NLRP3 inflammasome-mediated Caspase-1 activity resulting in pyroptosis induced cell death in RAW 264.7 macrophage cells.

Music Engagement and Episodic Memory among Middle-Aged and Older Adults: A National Longitudinal Analysis

Hillary J. Rouse, Cassidy Doyle, Mia D. Torres, Lindsay J. Peterson, Hongdao Meng
Faculty Mentor: Hillary J. Rouse (College of Behavioral and Community Sciences, Aging Studies)

The objective of this study was to examine how music engagement (passive and/or active) influences episodic memory over a period of 12 years in a nationally representative sample of middle-aged and older adults. Secondary data analysis of a sample (N=5020) of cognitively healthy adults from the Health and Retirement Study was utilized for this research. Linear mixed effects models were employed to examine the independent effect of medium (n=3,123) and high (n=936) music engagement on changes in performance on episodic memory tasks. Compared to those with low engagement (i.e., neither listening nor singing/playing an instrument), respondents who reported medium (i.e., either listening or singing/playing an instrument) or high (i.e., both listening and singing/playing an instrument) engagement performed 0.098 and 0.241 points better at baseline, respectively. In addition, participants with medium music engagement had episodic memory scores that declined by 0.023 points fewer per visit and those with high music engagement had scores that declined by 0.043 points fewer per visit than participants with low music engagement. The results of this study found that medium to high levels of music engagement are beneficial to performance on episodic memory tasks both at baseline and across time. These findings suggest that greater levels of music engagement may be able to protect against aged-related declines in episodic memory. Future research should examine whether interventions to increase music engagement can affect this trajectory of decline.

Prideful or Pathetic Politics: How Political Views Influence COVID-19 Related Behaviors in University Students

Yasmin Saeed, Weronika Julia Stelmasiewicz, Natalie Nagib, Juliana Catherine Rendle
Faculty Mentor: Donna Lee Ettel-Gambino (Judy Genshaft Honors College)

Prior research has indicated an increase of COVID-19 virus spread may have been associated with political affiliation. A key driver may be attributed to political views influencing healthcare decision-making. This study was conducted to gain insight regarding the relationship between political party affiliation and behaviors associated with COVID-19. Specifically, what was the influence of university students’ political views over CDC guidelines. A causal comparative approach was utilized. A MANOVA was conducted utilizing SAS 9.4 (Cary, NC). The independent variable was the students’ political identification. The dependent variables were (1)vaccination status; (2)test results outcome; (3)CDC guidelines adherence; and (4)commitment to self-isolation if exposed. This study resulted in four statistically significant findings. (1)The proportion of students (88%) who report being vaccinated (p<0.0001); (2)the proportion of students (48%) who received the booster (p<0.0001); (3)the proportion of students (93%) wearing a mask inside (p<0.0001); and (4)the proportion of students (67%) wearing a mask outside (p<0.0001). The results yielded from this study may leverage the conversation for policy change and may also aid in decreasing inequities related to healthcare decision-making influenced by political views. The findings from this study may also provide further contextual implications and evidence of how health management inequalities may be influenced by the difference in political views,
ultimately influencing inequities in many other aspects including housing, socioeconomic status, and healthcare opportunities. The changes that may arise from these results are necessary to provide the platform to ensure equality among citizens while simultaneously dismantling inequalities affiliated with decisions influenced by political views.

**Fostering Positive Social Interactions in an Inclusive Classroom**

Libenny Saint-Hilaire  
Faculty Mentor: Jolyn Blank (College of Education, Curriculum, Instruction and Learning)

During the early years, children learn to interact with each other in positive ways. Previous research has established the importance of helping young children learn the positive interaction skills that will help them be successful in school. The purpose of this study is to examine the use of Core Boards as a strategy to help children develop positive social interaction skills in an inclusive preschool classroom. This study will focus on two children. Data sources will include audio recordings of classroom interactions, anecdotal records describing children’s interactions, photographs, and an observation checklist tracking how often the children used the Core Board to communicate. I expect to describe ways children’s use of the Core Board translated to their interaction skills. Supporting young children’s development of positive social interaction skills is important because it helps children learn what to expect of relationships with others and how confident they are in social settings.

**Haiku and Temporality: Exploring the Philosophy of Time through Poetry**

Sierra Shellabarger  
Faculty Mentor: Benjamin Young (Judy Genshaft Honors College)

Haiku is a type of micropoetry originating from Japan. The style has several elements: three phrases, including a kireji, a word that ‘cuts’ the poem into two, and a kigo, a seasonal reference word. In my research, I examined haiku as a mode of temporal expression through the lens of a philosopher. Haiku inherently have several temporal aspects. For one, they almost always include a seasonal element, which can connect to deeper temporal motifs like aging, death, or rebirth. Haiku are also written in the present tense, which brings both the writer and the reader into a more present state of mind. But haiku also can be interpreted as a way of analyzing the differences between the eastern and western modes of experiencing/interpreting time. In my research, I compare the temporal philosophy of haiku to the temporal philosophy promoted by the Chinese spiritual tradition of Taoism. Overall, I will argue that writing and reading haiku can offer a unique temporal experience that helps bring one into the present moment, and possibly become more grounded and focused on the sensory world around them.

**Exploring the Relationship Between Housing Insecurity and College Students at USF**

Samruddhi Shinde, Kyra Hill, Nick DiBlanda, Tyler Brown  
Faculty Mentor: Amber Gum (College of Behavioral and Community Sciences, Mental Health Law and Policy)

Housing insecurity (i.e. homelessness, inability to pay rent every month, couch-surfing) is a phenomenon that affects 52.3% of college students nationwide (Olfert et al., 2021). These rates increase depending on year in college, race, and experiences of housing insecurity in childhood. Housing insecurity in college students has been associated been associated with poorer physical
health, mental health, and academic outcomes (Leung et al., 2017). Furthermore, those who are housing insecure are also more likely to experience food insecurity and/or financial insecurity. Despite the prevalence of this issue and outcomes of it, not many universities have developed programs to address it. In this project, we intend to learn about the experiences of USF students. We have designed a self-report survey that has been distributed to USF’s College of Behavioral & Community Sciences. We will be examining students experience with housing insecurity during their time at USF, any possible impacts of it, and desire for future programs addressing it.

**Modeling Aortic Stenosis from Known Risk Factors Using Parametric Methods**

**Gabrielle Snyder**  
Faculty Mentor: Chris Tsokos (College of Arts and Sciences, Mathematics and Statistics)

Coronary artery disease (CAD) is the leading cause of heart attacks. Heart attacks (or myocardial infarctions) occur when parts of the heart muscle do not receive enough blood. One of the main factors contributing to this loss of blood flow is aortic stenosis. Aortic stenosis is a narrowing of the valve of the aorta that prevents it from opening fully. This results in a decrease in blood flow both to the heart and the rest of the body. In this study we attempt to model the degree of aortic stenosis a person has based on our dataset of three-hundred and three individuals of various ages and genders with fifty-six total variables taken into consideration. Using ten of these variables — the supposed risk factors for aortic stenosis — we begin by testing for mean differences in males versus females and for the age brackets of below seventy years of age and above seventy years of age for the ten risk factors of DM, HTN, FH, CRF, BP, FBS, LDL, HDL, BUN, and VHD. Using parametric analysis on these variables, we create a model based on these risk factors for the degree of aortic stenosis a person might have. This model, in theory, will report of the degree a person’s aortic stenosis based on a few risk factors instead of the current, more expensive tests.

**Development of Social Media Nutrition Intervention Components: Perspectives from a Narrative Literature Review on a Global Outlook of Problematic Mealtime Behaviors in Children with Autism Spectrum Disorder**

**Evelyn Spiller, Jana Kandil, Syed Hasan**  
Faculty Mentor: Heewon Gray (College of Public Health)

It has been estimated that about 1 in 160 children have autism spectrum disorder (ASD) globally. However, this estimate excludes the unknown prevalence from many low-and-middle-income countries where ASD in children remains understudied. Young children with ASD may demonstrate adverse mealtime behaviors stemming from sensory sensitivity, neophobia, or opposition to the general appearance of certain foods. These qualities can have lasting impacts on their food intake and subsequently affect the body weight and nutritional status of these children. As obesity and nutritional deficiencies have become a growing concern among children with ASD in countries around the world, new literature on this subject has begun to emerge. This study aimed to conduct a narrative review of empirical literature published over the last 10 years on problematic mealtime and eating behaviors in children with ASD from various countries. PubMed and Web of Science were used with a combination of search-terms including ‘autism’, ‘mealtime behaviors’, ‘children’, and ‘nutrition’. There were 20 articles identified discussing the mealtime challenges experienced by parents and how food selectivity can influence the behavior of children with ASD. Our findings highlighted the
unmet need of data from underdeveloped countries. Additionally, the developmental process of social media components to supplement a nutrition intervention, the Autism Eats, for children with ASD, is described. Intervention materials and external resources for parents of children with ASD have been identified and tested on a private social media platform.


**Weronika Julia Stelmasiewicz, Yasmin Saeed, Juliana Catherine Rendle, Natalie Nagib**

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

A 2021 metaanalysis found persons with low incomes were more likely to be negatively affected by COVID-19 due to limited resources, inability to easily access healthcare, difficulty in complying with social distancing due to their work and/or their living situation. In this study we looked at how economic class affects behaviors related to COVID-19. A causal comparative approach was utilized. A multivariate analysis of variance was conducted utilizing SAS 9.4 (Cary, NC). The independent variable was economic class. The dependent variables included compliance with the following behaviors: 1)vaccination status, 2)booster status, 3)previous positive test results, 4) self-isolation compliance knowing they tested positive, 5) wearing a mask indoors, 6) wearing a mask outdoors, and 7) eating at a restaurant. This study resulted in two statistically significant findings. (1) The proportion of students (49%) who reported receiving a booster (p<0.03); and (2) the proportion of students (97%) who report self-isolation if positive (p<0.02). This suggests disparity in healthcare. This may be due to a lack of choice due to worry about being sick after the booster but needing to work to support their family. Some may not be able to self-isolate due to the demands of their job or living conditions. COVID-19 has shown exactly how flawed the healthcare system is with the disparities between low and high-income individuals. Low-income individuals must rely on the choices of their employers and public policy, which often don’t think of the public wellbeing. Understanding weaknesses in public health due to class helps better serve our communities.

**Effects of Gut Microbiome SCFA’s on Cerebral Organoid Development**

**Emma Stewart, Nathan Lanclos**

Faculty Mentor: Robert Hill (College of Arts and Sciences, Cell Biology, Microbiology and Molecular Biology)

Studies investigating the etiology of mental health disorders such as Autism, Bipolar, Schizophrenia, and Depression have identified distinctive physiological patterns of inflammation and cell proliferation in the brain that may represent lasting effects of events occurring during brain development. Literature has implicated short chain fatty acids derived from the gut microbiome as a potential cause for observed atypical neurochemistry, suggesting a mechanism acting through the gut-brain axis. This work aims to characterize these disorders, modeled in cerebral organoids using variable concentrations of metabolic byproducts from known gut microbiota. Furthermore, we hope to gain an understanding for pathways affected by these changes through transcriptomic analysis of associated genes.
Assessing of the Influence of Personality on Cognitive Function in Older Adults
Jude Sullivan, Kerri Murphy M.Sc., Dr. Nasreen Sadeq, Dr. Jennifer Lister
Faculty Mentor: Nasreen Sadeq (College of Behavioral and Community Sciences, Aging Studies)

To what extent does one’s personality relate to their performance on cognitive batteries in old age? This research draws from an ongoing longitudinal multisite study that investigates early indicators of cognitive change in older adults. By utilizing the Big Five Inventory (BFI) and the digital Cogstate cognitive battery, the relationship between personality traits (i.e., extraversion, agreeableness, conscientiousness, neuroticism, and openness) and cognitive performance (i.e., scores on psychomotor functioning, attention, visual and verbal learning, working memory, and executive functioning tasks) is assessed. One particular aim of this project is to fill in the gap in the current understanding of personality’s relation with innovative components of the Cogstate battery - the Groton Maze tasks and the International Shopping List Test - compared to more robust cognitive tasks. Preliminary analyses have indicated more significant correlations between openness and psychomotor functioning above other traits and facets of cognition. BFI data are collected annually from participants rather than every six months since personality is considered a relatively stable aspect of the self, especially in old age. As data from participants’ 12-month visits are collected, these initial analyses will be updated to include information from both baseline and 12-month visits. This will provide early insight about possible changes and/or continuities in personality stability and cognitive functioning in older adults.

Connecting Healing With Religion: Shamanism in Nepal and India
Alyssa Tallman
Faculty Mentor: Holly Donahue Singh (Judy Genshaft Honors College)

Shamanism is an ancient healing practice that has been adopted by countless countries throughout history. It is a system based on the idea of a shaman, which is a person believed by followers of the tradition to be able to call on spirits to heal others. Despite sharing a common name, the intricacies within the practice vary from region to region, and South Asia is no exception. This project focuses on shamanism in Nepal and India in particular, bringing to light both the similarities and the differences in how each country practices the tradition, as well as the details of the rituals in shamanism. This project reveals how intricately religion and healing are entwined within shamanism, and how this practice impacts the people of Nepal and India. Prominent issues such as gender roles and mental health can also be applied to shamanism, and this research touches on how the practice approaches these problems. Overall, this project shows how shamanism differs even within South Asia, and how the practice calls on the spiritual world for healing.

Enhanced Pilot Engagement Level Using the Brain Machine Interface (BMI) in Live Flight Control
Mark Thivierge, Kyle Mott, Redwan Alqasemi
Faculty Mentor: Redwan Alqasemi (College of Engineering, Mechanical Engineering)

Critical battlefield missions require proficient physical and cognitive capabilities for situational awareness and active decision making. Current technologies allow pilots operating unmanned flights to utilize non-invasive electroencephalography (EEG)-based Brain-Machine Interfaces (BMIs) to capture and convert brain signals into actions used for commands and flight control. This
project aims to utilize a motor imagery-based BMI system to extract, filter, and condition the pilot’s brain signal to control a flight target destination. Additional algorithms were developed to extract GPS data, map the target location to global coordinates using homogeneous transformation matrices, and autonomously navigate to and follow the selected target. Moreover, a graphical user interface (GUI) was developed to provide the user with visual feedback from the flight onboard camera and display commands that can be initiated using the EEG signal. A drone is used for testing and data collection, and the results show that the developed system was able to use the brain’s raw BMI data and filter it to (1) mental commands using filtered EEG signal, and (2) facial expression commands using extracted EMG and EOG data. The latter was easier to use and more accurate in conveying the pilot’s intentions. Pilot training was conducted for both control categories, and a full control of the drone using brain signals and reaching the target location was performed with an average error of 0.1%. The accuracy of control using brain signal through the BMI was 57.89% at the start of control session, and it decreased to 46.34% after 30 minutes of use.

**Investigating the Effect of Sugar Alternatives on U87 Human Derived Glioblastoma Cell Survival and Proliferation**

Natalya Thomas, Maricel Soliven B.S., Christopher Rogers Ph.D., Angela Poff Ph.D., David Diamond Ph.D., Dominic D'Agostino Ph.D

Faculty Mentor: Dominic D’Agostino (Morsani College of Medicine, Molecular Pharmacology & Physiology)

The Ketogenic Diet (KD) is currently being investigated as an adjuvant cancer therapy. This high-fat, low-carbohydrate, moderate-protein diet is thought to work in part by reducing glucose availability for cancer cells, a key substrate in their growth and proliferation. With a growing number of clinical trials seeking to understand the effects of KDs on cancer patients, it is important to study potential confounding factors that may complicate KD use in a clinical setting. Sugar Alternatives (SA) are commonly used in KD recipes wishing to mimic sugar-based products, but little is known about their individual effects on cancer growth and proliferation. Recent research suggests erythritol may enhance growth at low, near-physiological concentrations, but may elicit an inhibitory effect at high concentrations. U87 human glioblastoma cells were seeded at 15,000 per well and cultured for 7 days in 2mL of 5mM glucose, 5mM glutamine Dulbecco’s Modified Eagle’s Medium with or without 25mM of saccharin, sucralose, aspartame, erythritol, stevia, or allulose added as treatment. Each treatment had an n=4. 0, 5, and 25mM glucose and 5mM glutamine containing DMEM served as controls, with an n=6. Cell survival and proliferation were assessed via live/dead staining and hemocytometry on day 8. Pilot study limitations led to inconclusive data, however, protocol optimization including increasing seeding number, addressing aspartame solubility issues, and addressing poly-D-lysine issues is ongoing.

**Unequal Access: A Cross-Comparative Study on Treatment of Disabled Civilians vs. Paralympians in Ukraine**

Grace Thompson, Sydney Tubbs, Kim-Vi Nguyen, Juliana Madej

Faculty Mentor: Lindy Davidson (Judy Genshaft Honors College)

Ukraine has seen consistent conflicts that have caused increased rates of veteran and civilian disability caused by war. The recognition of high disability rates began after World War II, when war veterans from countries such as Ukraine, returned home with severe injuries. To provide a stress relieving activity for these injured veterans, the Paralympics were founded in 1948 and consisted mainly of wheelchair bound veterans with spinal injuries. Since then, the Paralympics have become an official
organization (in 1960) and have evolved to encompass a vast variety of disabilities which can partake in several modified sports. This project compares prosthetic accessibility for Ukrainian civilians and Paralympic athletes. Ukraine was chosen due to its success in the Paralympic games as a small nation and the vast difference in prosthetic funding and availability between Paralympic athletes and citizens. A literature review was conducted to cross-compare several factors influencing prosthetic quality and availability. Findings suggest that Ukrainian amputee athletes are successful compared to competitors due to the quality of prosthetics available to them, however a lack of regional funding creates a barrier for civilians. Additionally, Paralympic athletes across the board tend to perform better in the summer games than in winter; a difference that is even more drastic in Ukraine. Future research should focus on uncovering the reason for this inequity.

The Effect of Telehealth on Cardiac Surgery Health Outcomes
Stephanie Toledo
Faculty Mentor: Manh-Huong Phan (College of Arts and Sciences, Physics)

The development and advancement of communication technology has facilitated the delivery of care from a distance, otherwise known as telehealth. Over the last few decades, telehealth has grown in popularity as it offers a more convenient, economical and, in recent times, safer form of consultation, patient monitoring and asynchronous data collection than traditional healthcare. Practitioners who are mindful of the COVID-19 pandemic have taken advantage of telehealth given its ability to reduce viral transmission and protect patients from infection. Its use may be especially important for patients who are at risk of severe complications of COVID-19, such as those requiring cardiac surgery or recovering from cardiac surgery. This paper aims to illustrate and analyze the use of telehealth as a preoperative and postoperative option for cardiac surgery both in the context of COVID-19 and beyond. Special considerations were made to health disparities and physician/patient satisfaction.

BRAF Inhibitors as a Potential Treatment for RAS-mutated Forms of Melanoma and Pancreatic Ductal Adenocarcinoma
Kenneth Tsai, Alvaro de Mingo Pulido, Nia Gyongyosi, Yosef Nafii
Faculty Mentor: Alvaro de Mingo Pulido (Moffitt Cancer Center)

The MAPK/ERK pathway is a key physiological pathway for cell signaling with many downstream proteins. As a result, a mutation within the pathway can be detrimental as the mutation’s effect is rarely isolated, rather it is transduced to the variety of downstream proteins. Mutations of the RAS protein in the MAPK ERK pathway produce RAS mutant forms of Cancer which are characteristic to be both common and extremely aggressive. Their prevalence within society and resistance to treatment make new therapies highly sought after. Our study focuses on BRAF inhibitors Encorafenib and Dabrafenib, and their potential as a treatment for RAS-mutated forms of Melanoma or Pancreatic Ductal Adenocarcinoma (PDAC) to initiate senescence within these cancerous cells. Our objective is to stop cancer cell proliferation in vitro. This study utilizes both Melanoma and PDAC mouse cell lines. Optimization of drug concentration and treatment intervals were first established before multiple experiments run analyzing cell growth after drug treatment. Analysis was conducted using an Incucyte to track cell proliferation, as well as Western Blot analysis for downstream proteins of interest in treated lysed cells. Current findings indicate that the two cell lines respond well to the BRAF inhibitors in promoting senescence. Future directions are steered toward finding the role that conditional media of the treated cells have in promoting senescence. The possibility of BRAF inhibitors being used within immunotherapy treatments for RAS mutant forms of cancer would provide a more targeted therapy with fewer side effects for patients.
How Socioeconomic Status Impacts Health Outcomes in India
Sean Varughese
Faculty Mentor: Holly Donahue Singh (Judy Genshaft Honors College)

The issue of socioeconomic inequality within India has only continue to grow with urbanization over the years. The presence of this inequality within both rural and urban settings of India creates situations in which those who need access to quality evidence-based medical treatments do not have access to it. The reason for this lack of access is not because the technology does not exist to resolve the medical issue, but rather because the funding for certain types of medical equipment is not available in certain areas of India. The disparity in health outcomes based on socioeconomic status is staggering; this presentation seeks to locate and bring awareness to incidences of the highest disparities in health outcomes by analyzing various (economic) metrics.

The Influence of Social Standards and Acceptance on Superficial Behavior
Sharon Warrior
Faculty Mentor: Benjamin Young (Judy Genshaft Honors College)

Superficiality is defined as behaviors and speech that contradict the core personality of the individual. An individual’s behavior and speech can be self-altered to force adaptation of societal standards and changes in lifestyle. Although it requires excess effort, individuals even alter their behavior on a daily basis to obtain the desired results. Actions such as these are always caused by some motivator, or factor. When analyzing the root cause of altering behavior, the effort towards superficial actions stems from various underlying factors such as age, conformity, benefits, decision-making, and standards. Each of these components place pressure on the individual in different manners. For example, younger individuals have less experience in managing their behavior, which leads to superficial attitudes. Assumed benefits from specific actions may also force individuals to alter their behavior to reap the results. These various aspects reshape how individuals behave around others, leading to prominent superficiality. The influence of these factors must be mitigated to prevent superficial behavior from dominating one’s existence and interactions.

Cardiovascular Disease Detection and Future Implementations of Machine Learning
Courtney Weber, Jan Janda, Lisa Dawood, Katherine Rodriguez, Dang Nguyen
Faculty Mentor: Manh-Huong Phan (College of Arts and Sciences, Physics)

Cardiovascular diseases (CVD) are the leading cause of death worldwide. It is predicted that CVD will remain the leading cause of death and will account for more than 23 million deaths in 2030 globally. Early detection of these diseases, as well as early intervention, can give the patient their best chance of overcoming the disease. There are new methods of detection that are much less invasive compared to methods such as, for example, coronary catheterization. The innovative methods include phone apps, smartwatches, and patches that the user can easily add to their life. It is important to track cardiac health, and these methods make it very easy and practical. These devices collect data that can be used to model CVD using machine learning algorithms. This can ultimately lead to an earlier diagnosis which drastically increases the chances of survival. The objective is to analyze how different devices monitor cardiac health and how machine learning can be implemented. It was found that these new devices are effective in non-intrusively collecting cardiac health data, which allows the creation of predictive models using machine learning. Detection of CVD remains instrumental in order to decrease mortality associated with these diseases. CVD detection with the implementation of machine learning is a pressing topic with a very promising future.
Efficacy of Hyperbaric Oxygen Therapy on Autism in Children: A Systematic Review
Andrea Weitoschova, Lauren A. Bell, Kiara Toro, Ariana Ezequiel, Juan Riano Rincon, Shea-Lorane Lewis, Hannah M. Thomas, Isabela Zimmermann Rollin, Dang Nguyen
Faculty Mentor: Manh-Huong Phan (College of Arts and Sciences, Physics)

Autism Spectrum Disorder (ASD) is a neurological disorder affecting development, characterized by having difficulty communicating with others, having specific and restricted interests and wants, and repetitive behaviors. Several treatment options are being actively researched, with Hyperbaric Oxygen Therapy (HBOT) becoming especially of interest. Hyperbaric Oxygen Therapy, in which a patient is breathing pure oxygen periodically while in a high pressure chamber, has been proposed as a treatment for ASD. This systematic review aims to examine the effectiveness of HBOT on Autism treatment in children and assess whether or not there is a significant effect. Articles detailing specific experimental trials of HBOT on autistic children were used to determine the overall efficacy of HBOT as a treatment intervention. 16 articles went through a process of data extraction. Although many of the articles demonstrated some improvements, 7 (44%) articles had significant improvements of ASD symptoms in children, with 5 (31%) of them being specified as statistically significant. The remaining 9 (56%) articles demonstrated statistically insignificant improvement. Although more articles suggested that HBOT is ineffective, the results were overall inconclusive. The overall data does not show statistically significant support towards Hyperbaric Oxygen Therapy as a proficient treatment of Autism Spectrum Disorders (ASD) and HBOT remains a controversial therapy for Autism treatment in children. With further research and experiments, more conclusive results can be drawn on the effectiveness of Hyperbaric Oxygen Therapy.

Visual Thinking Strategies to Improve Self-Esteem in Children in Care
Courtney Welch, Brandie Teachey, Hannah Kantarjian, Laura Kulcsar, Nicolette Kulcsar, Samantha Desautels, Helen Pham
Faculty Mentor: Catherine Wilkins (Judy Genshaft Honors College)

We are seeking to demonstrate how visual thinking strategies (VTS) can be used to improve the self-esteem of children in care. VTS is a method of viewing and discussing art that involves three key questions: What is going on in this picture?, What do you see that makes you say that?, and What more can we find? Our hypothesis is that self-esteem will improve amongst the children in care who participate in our VTS program.

The Strength of Siblings: Challenges and Factors that Promote Resilience in Pediatric Sibling Bereavement
Lindsay Wilson
Faculty Mentor: Lindy Davidson (Judy Genshaft Honors College)

As neither the medical professional nor the primary caregiver, well-siblings play the unique role of witness and friend in pediatric medical settings. After the death of a terminally ill sibling, the well-sibling presents unique needs. In addition to coping with the loss of a brother or sister, the well-sibling must adjust to shifting parent-child and familial dynamics, all occurring during their formative years. Additionally, they are likely to live with this loss longer than the medical professionals and primary caregivers.
because they are so young. The symptoms and challenges they face range from short-term somatic complaints like headaches to long-term socioemotional difficulties with identity and belonging. Though conversations about illness and death are tough, well-siblings desire to be a part of them as they provide answers as they grieve and cope. Understanding their challenges and resilience-promoting factors in the bereavement process are crucial to ensure optimal adjustment into adulthood.

How Sports Marketing and Athlete Branding Influence Public Consumption

Madyson Winters
Faculty Mentor: Carol Osborne (Muma College of Business, Marketing and Innovation)

This thesis will examine how sports advertising and athlete branding impacts the consumer. For instance, it will explore how advertising increases knowledge about sports and the emotional aspects of consumer consumption. Personal branding has drastically increased with the recent passing of the NCAA law regarding college athletes profiting off their brand. This study will investigate how personal branding impacts sports consumption. With the significant increase, it is important to understand how these changes impacts sports.

Identification of Vector Mosquitoes: A Field Implementation of Novel Hardware and AI Algorithm

Brandon Wolfram and Estelle Toto Lobe
Faculty Mentor: Saddow Stephen (College of Engineering, Electrical Engineering)

Mosquito-borne diseases continue to be one of the leading causes of death globally. They arise from vector mosquitoes which can transmit various diseases such as malaria, yellow fever, dengue, etc. Vector-borne diseases account for 17% of all infectious diseases and affect millions of people around the world causing almost 3 million deaths annually as recorded by NASA. Critically, only a few hundred mosquito species (<1%) can transmit diseases to humans. Consequently, real-time identification of these species is essential to pest control agencies which have the goal of reducing and eventually eradicating such pernicious diseases. Therefore, an Artificial Intelligence (AI) algorithm integrated with novel trapping hardware has been developed to effectively identify vector mosquito species in real-time and enable targeted mosquito control. To create an environment for the AI system, a trap was developed which consists of an infrared sensor, an audio sensor, environmental sensors to record the surrounding environment, as well as a digital imaging chamber to capture the images required for the AI system. Mosquitoes are drawn to the trap using attractants, where the infrared sensors detect the presence of a mosquito. The mosquitoes’ flight is then recorded using the audio sensor and infrared sensors, after which the insect is suctioned down the trap using an impeller fan to the cameras. The images of the mosquitoes are captured; genus and species are classified automatically via patented and patent-pending AI algorithms.
The First against COVID-19: Frontline Workers’ COVID-19 Related Behaviors in University Students
Huichang Xu, Kelly Nicole Drago, Juliana Catherine Rendle, Natalie Nagib, and Donna Lee Ettel-Gambino, PhD
Faculty Mentor: Donna Lee Ettel-Gambino (Judy Genshaft Honors College)

Previous research has suggested the growing concerns of the emergence of the Omicron variant among frontline workers; specifically, they are concerned with the risk of transmitting the disease to household members. This study was conducted to gain a better understanding among USF students who work on the frontline and their COVID-19 related behaviors. A causal comparative approach was utilized. A multivariate analysis of variance was conducted utilizing SAS 9.4 (Cary, North Carolina). The independent variable was workers who work on and off the frontline. The dependent variables were students’ answers to the following questions: 1) concerns with the new Omicron variant; 2) avoidance of touching faces; 3) hand-washing compliance; 4) mask-wearing compliance; 5) immunization status as well as 6) booster status. This study identified two statistically significant findings: overall, students (93%) agreed that washing hands frequently prevents the spread of COVID-19 (p<0.004), and they (92%) had reported wearing masks when they are in an indoor setting (p<0.04). Moreover, these data suggest that there is a 27% difference between the proportion of students who wore a mask indoors and outdoors. Implementation of public policy to better support frontline workers may assist in alleviating stresses during these difficult times. Considering the rise of these invasive variants and the opportunity to prevent further spread to family and loved ones may positively impact their attitude and behavior compliance. Further research may be conducted to examine how mental stress from COVID-19 impact the academics of students who are frontline workers.

The Dalit Struggle for Healthcare Equality
Meghana Yarlagadda
Faculty Mentor: Holly Donahue Singh (Judy Genshaft Honors College)

The roots of Dalit oppression go back to the origins of the caste system within the Hindu religion. During their struggle for equality and security, Dalit communities have faced oppression and discrimination from higher caste members for centuries, even being denied basic human rights such as access to safe drinking water, as well as healthcare. While Dalits are the most susceptible people within the caste hierarchy to contract illnesses, they are the least likely to gain access to the healthcare they need, either due to their poverty or class discrimination which both act as barriers. In light of COVID-19, the barriers that Dalits have in accessing healthcare is a growing concern. The pandemic has hit these marginalized communities particularly hard, with the inability to receive vaccinations or practice proper social distancing. By researching the historical and current healthcare discrimination that Dalit communities faced and continue to face in South Asia, specifically in India, it becomes evident that Dalit communities are being deprived of basic human rights and opportunities, which is having current day implications on their health and lives. My research reflects the presence of Dalit oppression in the context of healthcare and COVID-19, as well as initiatives being taken by Dalit groups to increase their representation and pass policy proposals on how to address inequities in the Indian healthcare system during the pandemic.
The Artificial Sweetener Saccharin as a Potential Anti-Cancer Agent to Decrease Cell Proliferation

Pariya Yousefi, Christina Nichols
Faculty Mentor: Beth Jones-Mason (College of Arts and Sciences, Cell Biology, Microbiology and Molecular Biology)

Saccharin, once listed as a potential carcinogen, has more recently been suggested to have anti-cancer functions at high concentrations by causing tumor cell death and DNA damage. Similarly, we have observed a significant decrease in total cell number upon high concentration of saccharin treatment of a mouse B-cell lymphoma cell line. However, we have not observed this decrease to be due to cell death. We hypothesize saccharin’s effect may be cell-type specific and instead is causing a decrease in cell proliferation in our system. To verify that the rate of proliferation is decreased and to investigate a potential mechanism we will perform a fluorescence-based DNA replication assay and a PCR-based DNA damage assay. Furthermore, we will investigate if saccharin’s effect is permanent or reversible by performing a recovery test. Because we have not yet observed significant apoptotic death, we propose any saccharin-mediated DNA damage is delaying cell cycle progression and therefore may not be a permanent effect at the concentrations tested. The findings from our research will not only help to understand the mechanism by which saccharin impacts B-cell lymphoma cells but will also further inform other cancer-based drug studies.

Immune Response to Variant Receptor Binding Domain of the SARS CoV-2 Spike Protein

Pariya Yousefi
Faculty Mentor: John Adams (College of Public Health)

The novel severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) which emerged in late 2019 rapidly developed into the Covid-19 pandemic. This highly contagious disease rapidly became a major global threat to human health and public safety leading to 5.7 million deaths so far. Despite the development of vaccines, which have greatly reduced disease morbidity and mortality, the rapid emergence of new variants is a major challenge to vaccine efficacy and long-term immunity. We hypothesize that the emergence of mutations in the spike receptor binding domain (RBD) will affect vaccine induced or naturally acquired immune response to currently circulating variants of concern (VOC). To test this hypothesis, vaccination induced or naturally acquired serum antibodies to the original Wuhan strain of the spike RBD will be screened by ELISA for reactivity with recombinantly produced spike RBD from two major VOCs (Delta and Omicron). Recombinant spike RBD produced from the Wuhan strain of SARS CoV-2 will be used as control. Knowledge of immune response to emerging variants of the virus will provide information essential for future vaccine design, taking these variants into consideration. The recombinant proteins produced will also serve as reagents for population screening to identify individuals with antibodies to SARS CoV-2.

Efficacy of Different Biofouling Agents

Casey Urtecho and Virginia Zeigler
Faculty Mentor: James Ivey (College of Arts and Sciences, Geosciences)

In this experiment, it will be determined which agents display the most efficacy regarding anti-fouling, or the removal and dispersal of undesired marine plants, micro-organisms, algae and/or calcareous animals as found in the Tampa Bay waterways which serve as the parameter of the research. The point of focus in the antifoulants would be their efficiency in preventing biofilm accumulation, a prerequisite to denser organisms known for biofouling. The mediums to be studied will be comparing the
efficiency of the Nitto antifouling adhesive film, capsaicin soy-wax from the company Barnacle Stop and traditionally common copper antifouling boat-bottom paint alongside a control with no antifouling agent. Based on the continuation of a previous study, the anti-fouling materials were applied to the surface of various acrylic squares in a grid formation before being submerged for 3 months. Periodically checking on the rates of biofouling and a myriad of water quality elements, the product with the least amount of biofouling will be deemed the best option after consideration of its impact on the larger ecological system.

Inferencing Ability and its Relation to Comprehension in Children with Autism Spectrum Disorders

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Research suggests that children with autism spectrum disorders display varying difficulties with inferencing. Research identifies inferencing as necessary for comprehension, and skilled comprehension is an essential building block for effective early literacy development. The purpose of our study is to evaluate whether improved inferencing skills are indeed associated with increased comprehension performance in children with autism spectrum disorders. In our study, we investigate the relationship between inferencing and comprehension operationalized as listening comprehension and vocabulary skills. To accomplish this, participants were presented with storybook passages and images via a virtual meeting conducted between the child and the researcher. The child is asked a series of questions related to what they have heard or seen for each of the three measures. Thus far, we have data from 13 children with autism spectrum disorders (Mage = 65 months; 75% male; 50% attend public schools). The majority of participants are White (67%), followed by African American (17%), Hispanic (8%), and other (8%). The home language of all the participants is English. Estimates of effect size suggest that inferencing predicts listening comprehension (R² = .19) and vocabulary (R² = .21) skills; however, with only 13 participants, our analyses are underpowered for null hypothesis statistical testing (ps = .16 and .13). In the future, we will conduct analyses with a larger sample. As that may be, the results provide tentative support that inferencing is an important skill to consider when thinking about intervening to improve comprehension skills of children with autism spectrum disorders.
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