





	Scholar: Kendarius Butler
	Mentor: Dr. Christian Grattan
	Scholar's Major: BioChem ACS Presentation Type: Oral
	Sphingosine Kinase Inhibition Using Modified Variants of Sphingosine Kinase Inhibitor 1
<p>Sphingosine kinase is an enzyme involved in the sphingomyelin pathway responsible for converting sphingosine into sphingosine-1-phosphate (S1P). When the concentration of S1P increases proliferation and metastasis of cancerous cells and tumors throughout the body occur. By inhibiting sphingosine kinase, the concentration of sphingosine increases leading to apoptosis. Using a known sphingosine kinase inhibitor, SKI-1, novel derivatives were designed and assessed to improve interactions with the enzyme for better inhibition. These results led to the synthesis and purification of novel inhibitor molecules. These sphingosine kinase inhibitors will be assessed using an in vitro assay.</p>	
	Scholar: Josie Chestnut
	Mentor: Dr. Jeffrey Sinn
	Scholar's Major: Biology and Psychology Presentation Type: Oral
	Predicting Economic Conservatism through Measures of Deference to Prestige and Exploitive Motives
<p>Ideology researchers have shown Social Dominance Orientation (SDO) is able to predict economic conservatism. The present study draws on Schwartz Value Theory (SVT) to identify other potential motivations. Based on studies showing deference to luxury symbols (Nelissen & Meijers, 2011) and distinctions between dominance and prestige hierarchies (Maner, 2017), we posit that individuals may vary in their tendency to defer to prestigious or wealthy individuals and therefore examine two measures of deference to prestige (DTP). Given research suggests SDO reflects an exploitive motive (Sinn & Hayes, 2018) we examine three other exploitive motives as potential predictors: Machiavellianism, psychopathy, and sadism. Economic conservatism was measured with a 10-item scale focused on government intervention in the economy (e.g., raising taxes on the wealthy). DTP was assessed with measures assessing deference to the wealthy and "great-man" attributions for financial success. Exploitive motives were assessed through measures of sadism, psychopathology, and Machiavellianism. Hierarchical regression determined that both DTP measures accounted for variance in economic conservatism unique from SDO. No exploitive motives were found to predict economic conservatism, although sadism emerged, contrary to our hypothesis, as a weak negative predictor. Results are interpreted and next steps for developing better predictors of economic conservatism are discussed.</p>	


	<p>Scholar: Brooklyn Clive</p>
	<p>Mentor: Dr. Jeffrey Sinn</p>
	<p>Scholar's Major: Environmental Science Presentation Type: Oral</p>
	<p>Is Environmentalism a Moral Issue? Using Moral Foundations Theory and Schwartz Value Theory to Conceptualize Environmentalism in Terms of Morality</p>
<p>Moral foundations theory (MFT) purports to broaden our conception of morality by identifying five moral foundations: not only fairness and harm (emphasized by liberals) but also authority, purity, and ingroup loyalty (emphasized by conservatives). However, even this broader perspective seems to exclude broader commitments such as those motivating environmentalism. Drawing on Schwartz value theory (SVT), we examine universalism as a moral motive, and hypothesize that it will better predict environmental concern. To provide a direct comparison, we utilize a measure of universalism matched to the format of the Moral Foundations Questionnaire. Several hierarchical regressions offered strong support for predicted relationships. Compared to the five MFT foundations, universalism was the second-best predictor of self-reported liberalism (with harm and fairness not significant) and the best predictor of environmental concern. Comparing two specific issues, purity (and fairness) predicted the perception of Christian Nationalism as a moral issue, whereas universalism predicted the same for Environmentalism. Universalism also predicted disagreement with Christian Nationalism and agreement with Environmentalism. Overall, the results suggest that liberals view environmental concern as a moral issue and the MFT fails to represent the full moral breadth of liberalism.</p>	
	<p>Scholar: Joseph Dupuy</p>
	<p>Mentor: Dr. Michael Lipscomb</p>
	<p>Scholar's Major: Political Science Presentation Type: Oral</p>
	<p>The Moral Question of Economic Inequality</p>
<p>This work focuses on the immoral consequences of economic inequality. My presentation explains how we can use the capabilities approach to make judgements about the morality of economic inequality. I will be reviewing literature by moral, political, and economic theorists, building an argument that economic inequality has immoral outcomes. In addition to reviewing literature I'll be using statistics to demonstrate that economic inequality creates barriers to the ten central human capabilities. Using these two things I will aim to come to a conclusion about what barriers economic inequality creates for people in their economic, social, and political lives, and try to discover what an acceptable amount of economic inequality is for a society. This contribution to the public ongoing conversation about the moral questions related to economic inequality matters because it locates a particular way of making judgements about how economic inequality affects the world, helping to answer the important question of just how much inequality can exist before it is detrimental to a society or individuals.</p>	

	Scholar: Lucas Dupuy
	Mentor: Dr. Duha Hamed
	Scholar's Major: Math Presentation Type: Oral
	<p style="text-align: center;">The positive impacts of the COVID-19 lockdowns for students</p>
<p>The COVID-19 pandemic and lockdowns had made many negative impacts on individuals and society. Little research has been done about any possible positive effects the lockdown could have had. However, that does not mean there were only negatives during this time as seen by all the positives that happened for the environment and health in particular. College students were a group that had dealt with many changes, both good and bad. The sudden change to their lives had caused a great deal of mental strain, but there is a possibility that this time had opened students to new opportunities. This study has a focus on college students during the lockdowns. The goal is to investigate if there were any possible positive effects of the lockdowns on students. There will also be a deeper look into the correlation between the grade level of the student and the different aspects we are exploring through this study.</p>	
	Scholar: Brandon Ellison
	Mentor: Dr. Timea Fernandez
	Scholar's Major: BioChem ACS Presentation Type: Oral
	<p style="text-align: center;">Fabrication of an RNA-Based Fluorescent Biosensor for the Detection of Dopamine</p>
<p>Dopamine (DA) is a neurotransmitter that plays a role in the regulation of physical and emotional well-being. Irregularities in DA production have been linked to several addictive behaviors such as smoking, alcoholism, and obesity, as well as neurodegenerative disorders like Parkinson's disease. Early detection of DA abnormalities is paramount for the effective diagnosis and treatment of these ailments, while real-time imaging of DA could assist in the comprehension of their underlying mechanisms. As such, our project aims to design a DA-sensing RNA-based fluorescent (RBF) biosensor for initial in vitro experimentation and characterization. Using existing platforms, we can fabricate RBF biosensors that combine a ligand-sensing RNA aptamer with a fluorescent RNA aptamer to indicate the presence of biologically relevant molecules. Previous studies have used electrochemical and protein-based biosensors in the detection of neurotransmitters; yet, to our knowledge, no studies have developed a viable RBF biosensor for the detection of DA in vitro or in vivo. To date, we have designed, transcribed, and purified a total of eight biosensor constructs. In the near future, we plan on assessing their ability to specifically detect DA in a concentration-dependent manner using in vitro and in vivo studies.</p>	

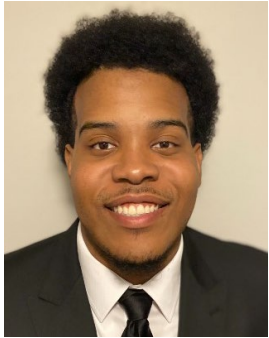

	<p>Scholar: Leslie Facio</p>
	<p>Mentor: Dr. Courtney Guenther</p>
	<p>Scholar's Major: Biology and Psychology Presentation Type: Oral</p>
	<p>Assessing physical activity using Fitbit technology and measuring well-being following a brief breathing mediation</p>
<p>Students, faculty, and staff have experienced increased levels of stress during the COVID-19 pandemic. Both meditation and physical activity have previously been demonstrated to help reduce stress and enhance well-being, however additional research is needed to better understand the intersection of mindfulness, physical health, and well-being, particularly as it relates to changes within higher education during the COVID-19 pandemic. Therefore, this study aimed to use Fitbit technology to examine physical activity and compare this to self-reported measures of well-being after engaging in a brief breathing meditation among students, faculty, and staff. Preliminary conclusions suggest that participants who completed breathing meditation, on average, increased levels of mindfulness and decreased in anxiety scores. Preliminary results also suggest that all participants, on average, displayed a slight decrease in levels of worry and a decrease in depression scores across the two-week study. Preliminary conclusions suggest that brief daily breathing meditations may help improve overall well-being. These findings have broader implications due to the COVID-19 pandemic, which will also be discussed.</p>	
	<p>Scholar: Nyssa Hemingway</p>
	<p>Mentor: Dr. Adolphus Belk</p>
	<p>Scholar's Major: Political Science Presentation Type: Oral</p>
	<p>A Critical Race Theory Analysis of Police Reform and Social Justice Movements</p>
<p>Critical Race Theory, the academic and legal movement to teach racial justice, not only examines quality of life, but also addresses how the intersection of race and other identities is important to improving this quality of life. The purpose of this analysis is to address how race affects attitudes towards police brutality and social justice movements in the United States and offer a comprehensive solution to police brutality. The research being examined is Pew Research Center data from 2016 to 2020 on attitudes towards police officers and from law enforcement themselves. There is significant data showing that race affects policing and how civilians view these encounters. The trends found also offer that many solutions to these problems can be remedied by education on the routes of these issues</p>	

	Scholar: Terrik Johnson
	Mentor: Dr. Joni Boyd
	Scholar's Major: Exercise Science Presentation Type: Oral
	An Examination of the Effects of COVID-19 Quarantine on Mental Health in College Athletes



Mental health has become an emphasis in the well-being of college athletes. Many athletes have reported abnormal levels of depression and anxiety, which may affect quality of life and total mental health. Therefore, the objective of this study was to examine the relationships between depression, anxiety, quality of life, and total mental health among college student athletes through a cross-sectional secondary data analysis. We further examined differences in these relationships among groups of gender and race, and between those that have been quarantined from exposure to COVID-19 and those that have not. From the primary study, a sample of 99 NCAA Division I college athletes completed self-report measures on the variables (66% female; 77% white). Data was analyzed through one-way ANOVA and post hoc means by SPSS. There was a significant inverse relationship between the variables of anxiety and depression on both quality of life and total mental health. Results showed a significantly higher impact of anxiety on total mental health for collegiate student athletes who have to quarantine for COVID-19 versus those that did not ($p < 0.05$). There were no significant differences in the relationships between the other groups. These results suggest that while anxiety and depression have a significant impact on quality of life for the group, those that had to quarantine are at an increased risk of lower quality of life and total mental health.


	Scholar: Samantha Kennedy-Scott
	Mentor: Dr. Brent Woodfill
	Scholar's Major: Anthropology Presentation Type: Oral
	Pre-field and Phase 1 Survey of Tyger Village (38UN213)

In 1984, Tommy Charles recorded a pre-contact Mississippian Era Native American village in the Enoree Ranger District of Sumter National Forest. That same year, the U.S. Forest Service funded limited test excavations by Daniel Elliot. The site was named Tyger Village and given site number 38UN213. Until this summer, it had not been revisited or further investigated. The current research, which I conducted with U.S. Forest Service archaeologist Nolen Caudell and my mentor, Dr. Woodfill, involved pre-field and phase 1 survey with the ultimate goal of completing a nomination packet for the site for the National Register of Historic Places. After several sterile judgmental shovel tests, however, we determined that the site location had been recorded incorrectly. There are a few possible reasons for this, which include shifting river location, soil deposition and erosion from hurricanes, and technological differences between 1984 and today. This presentation will include the history of Tyger Village and the Mississippian Era, what methods we used, some possible reasons the site 38UN213 was recorded incorrectly, and what knowledge was gained from this experience that will help us as we continue to locate and investigate Tyger Village.

	Scholar: Jomar Lewis
	Mentor: Dr. Christian Grattan
	Scholar's Major: Biology Presentation Type: Oral
	The inhibition of sphingosine kinase using modified variants of zone 2 of sphingosine kinase inhibitor one
<p>Sphingosine-1-phosphate is a bioactive lipid mediator that has been shown to play a critical role in cell migration, survival, and proliferation. It is phosphorylated from sphingosine, which has the opposite effect on cells. Sphingosine inhibits cell proliferation and causes apoptosis. Sphingosine kinase is a lipid kinase that catalyzes the phosphorylation of sphingosine into sphingosine-1-phosphate. Sphingosine kinase 1 is ubiquitously expressed in most cancer cells where it has been linked to cell proliferation, migration, and survival. Based on this information, sphingosine kinase 1 has become a novel target for anticancer therapy. We analyzed the molecular properties of several zone 2 inhibitors of sphingosine kinase inhibitor-1 using Molinspiration and then uploaded the structures into USCF Chimera to visualize and evaluate the docking analysis using Autodock Vina. The binding energies of each inhibitor were recorded from the docking analysis. The docking energies led to the synthetic development of several zone 2 inhibitor compounds which will ideally lead to an optimized inhibitor of sphingosine kinase.</p>	
	Scholar: Jasmine Moyd
	Mentor: Dr. Kelly M. Costner
	Scholar's Major: Mathematics; Minor in Educational Studies Presentation Type: Oral
	STEM Educator Experiences During the Pandemic: Preparation vs. Effectiveness in Remote Learning Environments
<p>Teaching during COVID-19 offered surprising benefits along with the obvious frustrations in the virtual classroom. This paradox led to an investigation of teacher responses to and experiences during the pandemic. While news outlets offer perceptions of the general public, research-based articles provide more accurate information. There is little research thus far on teaching science, technology, engineering, and mathematics while remote instruction was necessary. With a survey launched amongst SC Noyce Program graduates, we were able to gain preliminary insight on STEM teachers' feelings in terms of their preparation and effectiveness while using technology for instruction. Using a mixed-methods approach, we will be looking for a possible relationship between preparation and effectiveness. Analysis of open-ended survey responses will inform the development of focus groups to be conducted across summer 2021. Ultimately, our research will attempt to answer the question: Is there a relationship between STEM teachers' preparation and their perceived effectiveness in remote learning environments?</p>	

	Scholar: Bobbie Owen
	Mentor: Dr. Brent Woodfill
	Scholar's Major: Environmental Studies & Sociology Presentation Type: Oral
	Contributing factors of success or failure of grassroots movements in Rock Hill
<p>The purpose of this research project is to study the factors that impact the success or failure of environmental grassroots movements. For the purpose of this study an environmental grassroots movement is defined as a community-led organization or initiative aimed at making positive changes in its community for the sake of the environment or another cause. Grassroots movements work from a bottom-up approach and can lead to long-term changes within a community because it starts on an individual basis. During this study qualitative data was collected by interviewing people who participate in select environmental grassroots movements. Each interview ranged from 30 to 60 minutes and consisted of four demographic questions and six core questions pertaining to the study. This study seeks to find which factors are deemed most impactful from an inside perspective of the organization. Three factors to be considered in this study are interconnectedness of the group, funding sources, and active participation within the group. Interconnectedness of the group is defined as the personal connection the individual feels to the good. Funding sources can be described as donations, membership fees, or various forms of government funding. Active participation is the amount of interaction an individual has with the group.</p>	
	Scholar: Molly Quetel
	Mentor: Dr. James Hanna
	Scholar's Major: ACS Chemistry Presentation Type: Oral
	Visible-Light Promoted Alkylation of Imines in the Presence of an Organic Photocatalyst
<p>Recently, the use of visible light combined with a suitable photocatalyst to promote key bond-forming steps in organic synthesis has emerged as a viable strategy to achieve a number of important synthetic transformations. The photocatalyst involved is often a ruthenium or iridium polypyridyl complex, which absorbs light in the visible range to give a relatively long-lived excited state, which may engage organic substrates in a series of single-electron-transfer (SET) events. Compared to transition metal catalysts, organic photocatalysts typically cost less. This led our group to investigate their use in the alkylation of aryl imines with potassium organotrifluoroborates, which are safely handled powders, stable to air and water, exhibit functional group tolerance, and many are commercially available. This approach represents a novel C-C forming method, generating α-aryl amines, which are important pharmaceutical substructures. In this presentation, the application of a widely used organic photocatalyst, 9-mesityl-10-methylacridinium tetrafluoroborate (Mes-Acr-Me), will be discussed; data from optimization experiments, along with those from the scope and limitations studies including both imines and organotrifluoroborates, will be surveyed. In addition, results from Stern-Volmer quenching studies — carried out to verify the initial electron transfer event of the proposed mechanism — will be explored.</p>	

	<p>Scholar: Ana Lydia Rodriguez</p>
	<p>Mentor: Dr. Katherine Knop</p>
	<p>Scholar's Major: Psychology Presentation Type: Oral</p>
	<p>The Impact of COVID-19 and Learning Modalities on the College Experience</p>
<p>On December 31st, 2019, the first outbreak of SARS-CoV-2 was reported to the World Health Organization (WHO). Less than three months later, the outbreak was deemed to be a pandemic by the WHO. The COVID-19 pandemic caused widespread lockdowns and closed over 1,300 colleges and universities across the United States (Smalley, 2021). In response to the pandemic, colleges began to utilize online platforms to continue course content delivery. Previous research has demonstrated that the COVID-19 pandemic has impacted the academic performance (Laher et al., 2021; Gonzolaz-Ramirez et al., 2021; Gallup, 2020), social connections (Gonzolaz-Ramirez et al., 2021; Gallup, 2020; Active Minds, 2020), and mental health (Active Minds, 2020; Kecojevic et al., 2020) of college students. Using a mixed-method design, I investigated how the COVID-19 pandemic has altered the college experience for undergraduate students at a small 4-year public university in the southeastern region of the United States. I conducted semi-structured interviews and deployed an online survey in order to gather personal narratives and analyze widespread patterns. Results and implications will be discussed.</p>	
	<p>Scholar: Savannah Stinson</p>
	<p>Mentor: Dr. Michael Sickels</p>
	<p>Scholar's Major: Sociology Presentation Type: Oral</p>
	<p>The Experience of Faculty Women of Color in White Institutions</p>
<p>This study explores the experiences of women of color in a predominantly white university setting. I examine how discrimination and relationships with colleagues both within and across departments affects the work life of WOC faculty. The research is based on nine semi-structured interviews with women of color faculty at a southern university. The preliminary findings suggest that (1) While women of different racial/ethnic backgrounds have distinctive faculty experiences, most have experienced discrimination throughout their academic career. (2) Faculty WOC face harsher judgement in areas such as tenure and promotion or managing the classroom; however immigrant WOC faculty tend to perceive these discriminations less blatantly than Black WOC faculty. (3) Experiences of isolation are common, and establishing relationships with colleagues is particularly challenging for WOC faculty both within and across departments. Many of these women actively seek to establish relationships with other women of color and develop a sense of comradery. These relationships may be important for ensuring the recruitment and retention of WOC faculty.</p>	

	Scholar: Eric Walters
	Mentor: Dr. Jason Hurlbert
	Scholar's Major: BioChem ACS Presentation Type: Oral
	Expression and Purification of GeneM: A Novel Virulence Factor of Unknown Function from the Phytopathogen <i>Clavibacter michiganensis</i>
<p>GeneM is a novel virulence factor of unknown structure and function produced by <i>Clavibacter michiganensis</i>, the etiological agent of many diseases in agricultural plants. The gene has been shown to control symptomatic necrosis in tomato and potato plants, yet mutants of the gene exhibit little or no control for the aforementioned function. BLAST analysis of the amino acid sequence has identified homologous proteins belonging to the patatin superfamily, however, bioinformatic analysis of the amino acid sequence and homology modeling contradicts this identification. In this work, we describe our efforts to model the structure of Gene M and express it in recombinant <i>Escherichia coli</i> cultures. Of the three algorithms used to generate a homology model of GeneM, only one gave us a plausible structure. <i>De novo</i> modeling using trRosetta gave a model that is structurally similar to the homology model. Expression trials were performed using different strains of <i>E. coli</i> including BL21, NiCo, and Rosetta 2, and based upon the results, cultures of <i>E. coli</i> BL21 Rosetta 2 (DE3) a band at the expected size on SDS-PAGE gels. Future work includes scaling up to 6L expression cultures and developing a chromatographic methodology to purify the protein for enzymological studies.</p>	

Thank you

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