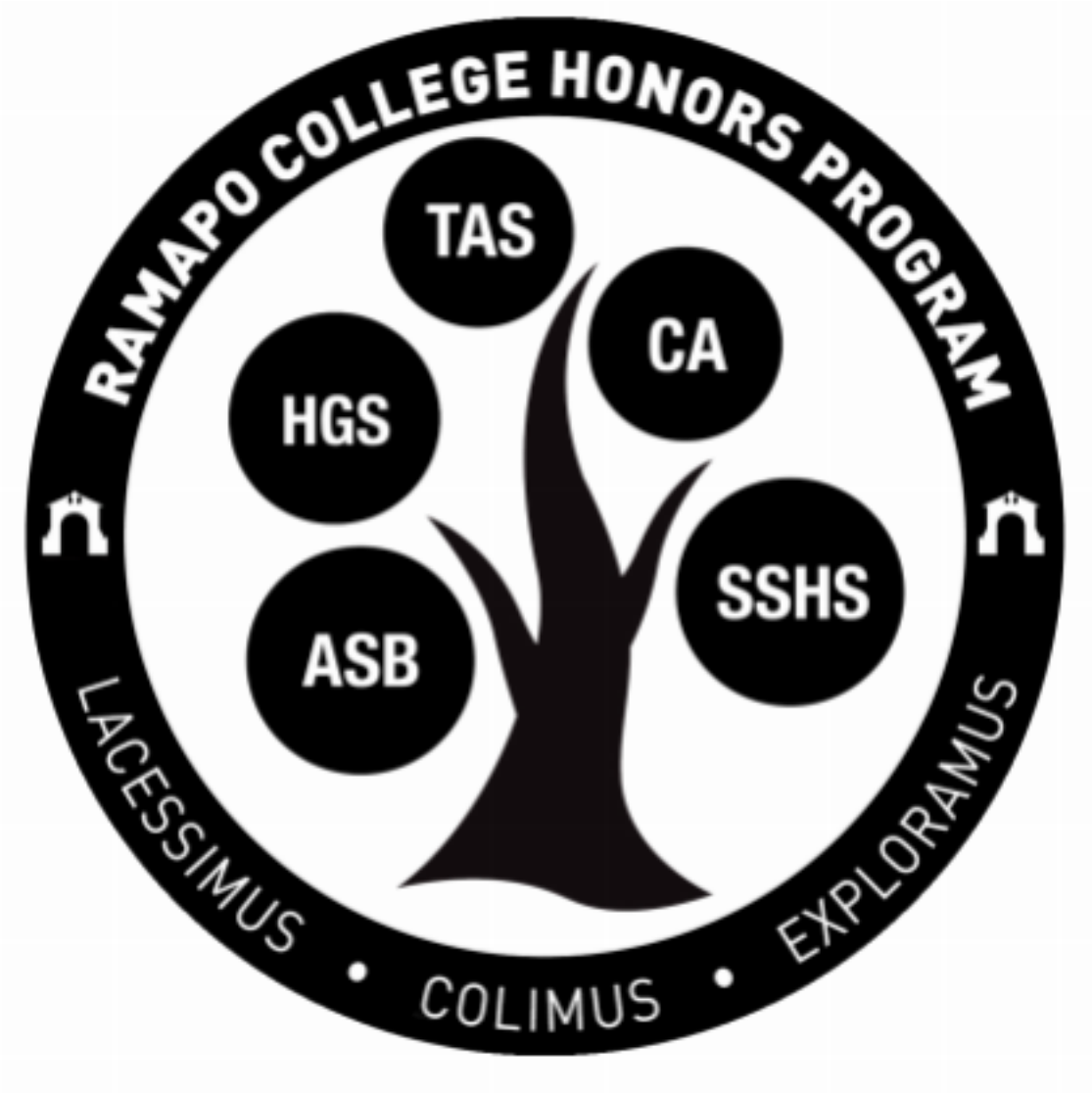

Sixteenth Annual

College Honors Symposium

Wednesday, April 17, 2024

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College Honors Mission Statement

The Ramapo College Honors Program is a community of faculty and students dedicated to intellectual, creative, and moral engagement. Honors students seek excellence through continual guidance and a distinctive curriculum of critical thinking, intercultural and international understanding, experiential learning, service, and interdisciplinary studies. The end of the program is the beginning of an enriched and accomplished life. Ramapo College invites all who have the aspiration, potential, and passion for discovery to join.

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Symposium Agenda

Opening Remarks - 4:00pm

Honors Director Erin Augis, Provost Michael Middleton

Poster Session I - 4:15pm

Aafnan Alam, Muhaddisa Alidina, Rola Aly, Niki Bajracharya, Sannia Balgahoom, Allan Baum, Maxianne Best, Melanie Brentnall, Deia Buluag, Jillian Carbine, Olivia Church, Rebecca Gathercole, James Jackson, Shayna Kenduck, Rojja Kharel, Abigail Kunde, Heidi Lin, Kiely Paris-Rodriguez

Oral Presentations – 5:00pm

Avalina Michel, Hema Patel, Olivia Roche

Poster Session II – 5:45pm

Elena Magyarosi, Rhisha Mohin, Victoria Niedbal, Nashari Payano, Maya Peacock, Samikshya Pokharel, Melissa Priester, Demitra Rooyakkers, Wanda Sarbak, Mia Schutz, Amravi Tarachandani, Anagha Brahmajosyula, Avantika Thakur, Alisa Varughese, Jenna Vesey, Cassidy Wade, Weina Xiao

Award Recognition and Photos - 6:30pm

Program Closes - 7:00pm

College Honors Senior Project Abstracts

Session I

Aafnan Alam
Biology

Understanding Sex Differences of eCB Modulation Through Fear Conditioning On Adolescent Rats

Abstract: This project will discuss how fear-conditioning affects the endocannabinoid system (eCB) in regards to fear and memory among male versus female rats in vitro. By performing such research, it can be further understood why some stress related disorders have different occurring rates based on sex, ultimately reaching a step closer to therapeutic treatments for people. When comparing male rates with female rats, it can be hypothesized that sex differences in adolescent hippocampal cells can cause functional differences in the endocannabinoid system and impact emotional learning and behavior. Thus, if there is more endocannabinoid activity in female rats than male rats, females might have a lower threshold for where synaptic activity occurs. Sets of rats will be put through fear-conditioning chambers and either injected with JZL 184 or no drug. On day one the rats will be exposed to a shock, and on day two will be expected to freeze despite there being no shock. Preliminary results demonstrate that by increasing 2AG, freezing is decreasing on recall day, suggesting a weaker memory in female rats compared to the control and a stronger memory in male rats compared to the control regardless of drug administration.

Sponsor: Dr. Christian Reich **| Reader:** Dr. Yan Xu

Acknowledgements: I would like to thank the TAS and SHS staff, Dean Saiff, and the Ramapo College Honors Program for the support of this project, as well as Shubashree Shahi, Nicholas Calhman, Georgia Apparadis, and Kevin Alvarez for their technical assistance.

Muhaddisa Alidina

Accounting, minor in Finance

Universal Health Insurance in the US

Abstract: A healthcare system appears to be straightforward: a system designed to cover expenses when we experience illness, require a medical procedure, or go in for an annual check-up. However, it is crucial to recognize that healthcare extends beyond medical coverage. It plays a vital role in our society, intersecting with nearly every aspect of our daily lives, including our Gross Domestic Product (GDP), productivity, life expectancy, and, most importantly, our overall happiness. Within the United States, healthcare costs are egregious. A universal medical system can be our country's best shot to not only reduce healthcare costs but create a more level playing field for all. They would do this through enhancements to the country's current medical system including through increasing the use of PA's, encouraging generic drugs, reducing medical school costs and a reduction to administrative costs. It is important to note that with these potential decreases in healthcare costs, an investment should be made in mental health resources which currently individuals do not have access to under the United States' private health insurance plan.

Sponsor: Professor Stephen Larson **| Reader:** Professor Kathryn Yeaton

Acknowledgements: I would like to thank Professor Larson for all of his help in this project and Professor Yeaton for helping read my paper to ensure I was on track!

Rola Aly

Biology

Comparative Microbiological Analysis of Hand Drying Methods: Hand Dryers, Paper Towels, and Air Drying

Abstract: Effective hand hygiene is instrumental in preventing the spread of infectious diseases, particularly in communal spaces such as healthcare facilities, educational institutions, and public restrooms. As microbial contamination on hands is a primary vector for pathogen transmission, a comprehensive analysis of hand drying methods is essential for formulating evidence-based recommendations that enhance public health practices.

The existing body of literature provides a mosaic of findings on the efficacy of hand drying methods, often with conflicting results. While some studies suggest that specific methods may be more effective in reducing microbial contamination, others emphasize environmental considerations or user preferences. This variability necessitates a systematic and comparative analysis to distill reliable insights and contribute a cohesive understanding to the scientific discourse.

Sponsor: Professor Jose Mediavilla **| Reader:** Professor William Mitchell
Acknowledgements: I would like to thank my sponsor and reader for all of their help and guidance as well as my parents for their endless support and belief in me.

Niki Bajracharya
Environmental Science, minor in Sustainability and Environmental Studies

Biomimicry: A Path Towards A More Sustainable Future

Abstract: Biomimicry is the process of "learning from and emulating biological forms, processes, and ecosystems tested by the environment and refined through evolution" (Kennedy et al., 2015). It is an interdisciplinary field that combines biology, physics, chemistry, engineering, design, business, and more. Natural form or Organism level, Behavior or Process level, and Ecosystem or System level are three different levels of biomimicry. Japan's "700-Series Shinkansen" or "bullet train" mimicking the nose of a Kingfisher that can dive into water without making a splash to prevent a sonic boom resulting from passing through tunnels with high speed is one of the famous examples of organism-level biomimicry. Biomimicry can be a powerful tool to create sustainable solutions when it is thoughtfully designed and applied with sustainability frameworks and environmental sustainability goals in mind. Despite its vast potential, there is a huge gap between research and application in the field of biomimicry. Research and development professionals should look at ways to incorporate biomimicry in their product innovation and manufacturing processes for a more efficient and sustainable pathway.

Sponsor: Dr. Carrie Miller **| Reader:** Dr. Eric Wiener
Acknowledgements: I would like to thank Dr. Carrie Miller, Dr. Eric Wiener, and the Ramapo College Honors program for providing guidance and institutional support.

Sannia Balgahoom

Nursing

Unconscious Biases in Healthcare

Abstract: Unconscious biases can be harmful in any situation. When considering a career in healthcare, it is important to recognize how diverse these environments will be not just patient wise but also regarding the people you work with. While these biases are from our unconscious thinking, that doesn't take away from how harmful they can be. Building trustful relationships with our patients is the key to ensuring safe and effective care. If any sort of bias slips, that relationship can be broken and that can greatly affect the care of the patient. For this reason, it is important for healthcare facilities to provide their staff with bias reduction programs. Staff need to be able to recognize when their biases are taking over and be able to stop them before it is too late. It all starts with one's self-awareness and their ability to take accountability for their actions. At the end of the day, these are real people's lives that are being taken care of and a relationship of trust will go a long way in providing the care patients deserve.

Sponsor: Dr. Amy Pizzulo **| Reader:** Dr. Lorraine Santangelo

Acknowledgements: I would like to thank Dr. Pizzulo and Dr. Santangelo for their help in my project and I would also like to thank my family for their continued support.

Allan Baum

Computer Science, minor in Biology

The Reward Punishment Learning Task (RPLT) and Its Role in Understanding Parkinson's Disease (PD)

Abstract: Parkinson's Disease (PD), is a chronic and progressive disease which affects the nervous system. PD has been around for hundreds of years, yet much is still to be discovered about it. The classical symptoms which most people imagine when thinking of the symptoms of PD involve tremors and a slow shuffling gait. Unfortunately, the effects of Parkinson's disease often extend far past the expectations most held. In addition to the slow, shuffling gait, a wide variety of additional symptoms, which are vast and wide-ranging can be noted.

They include, but are not limited to: urinary incontinence, sexual dysfunction, bradycardia, and major depressive disorder. Additionally, contrary to what many will think, PD has been shown to occur in patients significantly younger than the age of 60. Eventually, PD can cause severe cognitive and impulsivity disorders, which in some cases culminates in dementia. It is these issues which are the most disturbing, and it is because of these symptoms that the Reward Punishment Learning Task exists in order to better understand how these issues relate to the overall disease, common medications, and common comorbid conditions such as Major Depressive Disorder (MDD).
Sponsor: Professor Joost Monen **| Reader:** Professor Kenneth McMurdy
Acknowledgements: I'd like to thank Catherine Myers of the East Orange Veterans Administration for involving me in her research.

Maxianne Best
Political Science, minor in International Studies
The Tale of Two Colonies: Belgian Rule of Rwanda and British Rule of Ghana
Abstract: Colonization has had a perpetual impact on the African continent, shaping its physical and political geography. Colonial powers exploited African territories, using their resources and human capital to establish colonial governments that created societal divisions based on ethnicity and religion. Even after gaining independence, African countries still face the persistent effects of colonial influence through external interventions and internalized sociopolitical issues. This paper emphasizes the need to examine how colonization has shaped the birth of African countries and their governance structures post-independence. By comparing the colonial periods of Rwanda and Ghana, colonized by Belgium and England, respectively, this research offers a case study to uncover the enduring consequences of colonization in Africa. Despite sharing colonial experiences, the two nations have taken different paths towards independence. Studying their trajectories can help us understand the challenges and advancements of African countries as they navigate the complexities of nation-building in the aftermath of colonial legacies.
Sponsor: Professor Erick Castellanos **| Reader:** Professor Karl Johnson
Acknowledgements: I would like to acknowledge my sponsor, reader, and the Political Science department which contributed greatly to my project and general interest in this topic over the course of my Ramapo career.

Melanie Brentnall

Mathematics, minor in Secondary Education Certification Program

Analyzing Serve Strategies in the Women's Tennis Association

Abstract: A tennis player's serve can make or break their performance. Players traditionally hit a powerful, more risky first serve, followed by a slower and more conservative second serve. Using data from all Women's Tennis Association matches since 2016, we analyzed whether this is the optimal serve strategy, as opposed to using two strong serves. We also consider a couple of other factors that may have an effect on serve quality.

Sponsor: Dr. Matthew Jobrack **| Reader:** Dr. Ken McMurdy

Acknowledgements: Thank you to the Biology Laboratory Coordinator and Technician for their consistent support.

Deia Buluag

Nursing, minor in Psychology

The Effects of Anxiety and Burnout in Nurses Working in Patient Care

Abstract: Anxiety and burnout are often associated with mental health disorders and physical symptoms that can affect the way a nurse takes care of patients in a clinical setting. These emotions can disrupt patient care, leading to problems relating to patient safety. This paper will focus on defining "anxiety" and "burnout" and how it affects nurses physically, emotionally, and psychologically. Moreover, it will explore the different causes and contributing factors that lead nurses to feel anxious and burned out. Some of these causes include work-related stress, life experiences, and personal stressors. Furthermore, different coping mechanisms and personality types will be assessed regarding how they contribute to the processing of anxiety and burnout in nurses. Physical, emotional, and psychological consequences of anxiety and burnout will also be discussed, and how they negatively affect the quality of patient care and patient safety. Moreover, anxiety and burnout has increased in the past two years due to the pandemic. These factors will be examined about the COVID-19 pandemic and how they have affected the nursing profession as a whole. Lastly, interventions to combat anxiety and burnout among nurses will be analyzed. Some of these interventions include

residency programs and anxiety-reducing strategies from an organizational level and a personal level.
Sponsor: Dr. Amy Pizzulo **| Reader:** Dr. Donna Flynn
Acknowledgements: I would like to thank Dr. Pizzulo and Dr. Flynn for working with me on this project during this past year. .

Jillian Carbine

Social Work, minor in Psychology
Attitudes of Social Workers Employed in Substance Use Treatment Facilities on Harm Reduction: An Ethical Conflict
Abstract: This study's purpose is to understand the lived experiences of social workers in the field of substance use disorders and how they navigate ethical decision making. Areas of focus include investigating how current treatment practices in the field of substance use disorders align with the National Association of Social Workers Code of Ethics, integration of harm reduction into practice, and how agency policies can give guidance or cause conflict in ethical decision making. A qualitative study design was used to achieve the purpose of this research. The researcher interviewed 10 credentialed social workers in the field of substance use disorders over the age of 18 to gather data. Interviews were conducted individually via WebEx or face to face, consisting of 16 open ended questions, with the researcher asking unstructured follow up questions as needed. Results present implications for education of social workers both continuing and pre-license, best practices to promote the well being and self determination of clients, and the importance of utilizing research informed approaches.
Sponsor: Dr. Stephanie Sarabia **| Reader:** Dr. Kathleen Ray
Acknowledgements: Thank you to Dr. Sarabia and Dr. Ray for your insight and guidance during this project and to my friends and family (and cats and dogs) for all your love and support!

Olivia Church

Mathematics, minor in English and Literary Studies

The Transformative Poetry of Native Women Joy Harjo, Linda Hogan, and Louise Erdrich

Abstract: The poetry of Native American women Joy Harjo, Linda Hogan, and Louise Erdrich is valuable and transformative, offering insight on what it means to be human. Harjo, Hogan, and Erdrich demonstrate the importance of poetry in giving voice to injustice and hardship, examining the past, providing opportunities for healing, and allowing for the exploration of the world and humanity. In the works of these women, poetry is transformed into more than simply a work of writing. Poetry becomes an act of protest, of remembrance, of healing, of celebration, and above all, of survival—a way to make sense of life, infuse it with meaning, endure its hardships, and celebrate its joys.

Sponsor: Professor Monika Giacoppe **| Reader:** Professor Yvette Kisor

Acknowledgements: I would like to thank Professor Giacoppe and Professor Kisor for guiding me throughout this process, as well as my family for supporting me now and always.

Rebecca Gathercole

Contemporary Arts, minor in Creative Writing

Taking a Beating: A 30-Minute TV Comedy

Abstract:Taking a Beating follows 23-year-old aspiring baker, Maya, as she acclimates to her new job as social media manager at Louie's Bakery. She has to contend with the trials of working customer service with a small staff and must learn to embrace the job with its difficult regulars, coworker rivalries and romances, and the bakery's looming financial problems, while making her baking dreams come true.

Sponsor: Professor Kelly Dolak **| Reader:** Professor Neel Scott

Acknowledgements: Thank you to Professor Kelly Dolak and Professor Neel Scott for their guidance and feedback, to my classmates from TV Writer's Room who saw this project in its early days, and to my friends and family for their emotional support.

James Jackson

History, minor in Psychology

Athenian History

Abstract: The paper focuses on the development of Athens from a deteriorating city in the hinterlands of a decaying empire to an internationally recognized hub of culture and history. Many fail to recognize that modern Athens, lauded as the cradle of Western civilization, was a largely irrelevant, impoverished city as recently as the nineteenth century. The paper explores early development plans that began guiding Athens from squalor and obscurity to the position of reverence held by the city in the modern day.

Sponsor: Dr. Pinar Kayaalp **| Reader:** Dr. Ira Spar

Acknowledgements: Thank you to the Honors Program, the Roukema Center, and Dr. Pinar Kayaalp for your support in completing this project!

Shayna Kenduck

Mathematics and Secondary Education

School Safety Across the Years: A Statistical Analysis of School Shootings

Abstract: School shootings have become an epidemic in the United States. Safety is a major component of creating a positive learning environment. It is necessary for students to feel safe from all types of violence in order to truly thrive academically and socially. The school shooting American epidemic is a mass problem greatly worsening each year. Although this topic is controversial and ideas for solutions vary greatly, no one can deny the severity of the situation.

Sponsor: Dr. Matthew Jobrack **| Reader:** Dr. Julie Norflus-Good

Acknowledgements: Special thanks to Dr. Jobrack and Dr. Good for all of their guidance and support through this process.

Rojja Kharel

International Studies, minor in International Business and Entrepreneurship

The Relationship Between Education and Brain Drain

Abstract: Education shapes a nation in becoming better at serving its people. There is a positive correlation between literacy rate and development in a country which means that when people are educated they tend to live better lives. Education is one of the major factors leading to migration since a long

time. A lot of nations are facing brain drain because people are leaving their country to go to a different one to receive education. This paper will explore the reasons why people decide to make this decision and compare the education systems of a developing country and a developed country: Nepal and Finland. My main research question is whether a quality education is negatively correlated with brain drain. I will explore the factors that affect brain drain in both developed and developing nations by using the examples of Nepal and Finland and talk about what other factors affect migration or brain drain in these nations.
Sponsor: Professor Erick Castellanos **| Reader:** Professor Rebecca Root
Acknowledgements: I want to thank Professor Castellanos and Professor Root for being very helpful and supportive not just for my independent study but in many other aspects of my college journey.

Abigail Kunde

Heidi Lin

Kiely Paris-Rodriguez
Political Science, Social Science: Space Psychology
Antarctica Pizza Pie
Abstract: With the effects of global warming imminent, Antarctica could soon become a valuable economic resource. While this is presently prevented by the harsh realities of Antarctica geography, there are actions nations can take now to secure their standings in the region. This paper aims to analyze how nations could move past the Antarctic Treaty to claim the territorial wedges for economic opportunity.
Sponsor: Professor Jeremy Teigen **| Reader:** Professor Dean Chen
Acknowledgements: Thank you to Professor Teigen and Professor Chen for all the support in this project and throughout my time at Ramapo.

Avalina Michel
Nursing

Wartime Nursing: The Lived Experience of Nurses During the Russo-Ukrainian War

Abstract: Although not recognized officially until the end of the 19th century, wartime nursing is the pinnacle of empathetic behavior. The value that comes from these nursing experiences has not been studied as extensively as their violent counterparts. Studying war nurses, especially in the new age of proxy wars, gives new perspectives on the importance of humanitarian aid and how to work better as an interprofessional team. A literature review and interview study were conducted to understand the role of wartime nurses. The literature review comprised 11 articles including news articles, book excerpts, and qualitative studies. These articles explored the role shifts from morale boosters to critical healthcare personnel. The importance of preparations and post-war reassimilation were also explored. A focus on resource management in more recent wars gave insight into the difficulties faced by wartime nurses. Conversations with volunteer nurses on their experiences in the Russo-Ukrainian War were conducted. Major themes from these interviews included the following: working in an interdisciplinary team, emotional well-being, post-service reassimilation, and selfless behavior. The overall experience of these interviews highlights the value of volunteers in preparing the Ukrainian healthcare team. Their actions play an important role in the outcomes for the Ukrainian people.

Sponsor: Dr. Patrick Mattis **| Reader:** Dr. Lorraine Santangelo
Acknowledgements: I appreciate the time and efforts of the nurses who shared their experiences in the Ukraine war and hope they continue their valuable work.

Hema Patel
Biology
Beyond Traditional Therapies: Targeting the DRK1A gene and Emerging Technologies for Improving Cognitive Function in Children with Down Syndrome

Abstract: Down syndrome affects 1 in 700 live births in the United States, making it the leading genetic cause of intellectual disability. The root cause of this condition stems from an extra chromosome 21, leading to a wide range of physical and cognitive impairments. Current interventions, such as speech-language and occupational therapy, aim to emphasize early cognitive and language skills to help children reach their highest potential. Although these interventions strive to overcome neurodevelopmental barriers, they do not tackle the root cause, and thus, fall short of fully alleviating many of the cognitive symptoms associated with the disorder. Innovative research is now transcending traditional boundaries, aiming to target and inhibit specific genes that are overexpressed in individuals with Down syndrome to combat the disorder using a genetic approach. For instance, inhibiting the DYRK1A gene has shown promise in boosting cognitive function, learning, and memory. Future genetic approaches aim to take this many steps forward by utilizing technology such as CRISPR to excise the entire Down syndrome critical region, encompassing many genes involved in cognitive impairment. The ultimate goal is to use the groundbreaking XIST technology to completely silence gene expression of the additional chromosome, thereby eradicating the root cause of the disorder and preventing the manifestation of the impediments caused by Down syndrome. By examining neurodevelopment, targeting specific genes, and harnessing emerging technologies, new pathways are being explored to enhance cognitive functions in children with Down syndrome, providing new hope for individuals grappling with this condition.

Sponsor: Dr. Joost Monen **| Reader:** Dr. Yan Xu

Acknowledgements: I would like to thank my advisor Dr. Monen for his guidance and support throughout my project and Dr. Xu for providing valuable feedback on my drafts.

Olivia Roche
Nursing, minor in Public Health
Vaccine Hesitancy and Medical Mistrust in the Town of Ramapo, Rockland County, NY

Abstract: In 2018, the United States experienced its largest outbreak of measles in over two decades (Otterman, 2019). A small county 20 miles north of New York City, Rockland, became the center of this outbreak. Rockland County, NY declared a state of emergency following a surge of measles cases (Rockland County Department of Health[RCDOH], 2019). As of September 25, 2019, when the State of Emergency was concluded, Rockland County's Department of Health documented 328 measles cases among the population (RCDOH, 2019). Despite having a readily available vaccine with a 97% efficacy rate, the measles virus was able to spread throughout the county among unvaccinated individuals (RCDOH 2019). Rockland County continued to be a center for communicable diseases including polio and COVID-19 recently. The prevalence of these outbreaks including measles were repeatedly concentrated especially within the Town of Ramapo (RCDOH, 2019). The Town of Ramapo is Rockland's more economically, religious, and ethnically diverse region (Census, 2020). In other words, the Town of Ramapo encompasses populations that have historically been underserved by public health and social services. The spread of communicable diseases can be mitigated through public health measures such as vaccinations. Rockland County's low vaccination rates place its residents at risk for illnesses once considered eradicated or low risk in the United States. Rockland County has repeatedly underperformed against neighboring counties in regard to vaccination rates. These low vaccination rates place the Rockland community at risk for communicable diseases. Vaccine hesitancy and resistance is not a recent phenomenon in the United States and vaccine perception varies among communities. Understanding why Rockland residents' perception on vaccines differ from their peers is essential to preventing disease outbreaks that can devastate the population.

Sponsor: Dr. Alice Park **| Reader:** Dr. Anne Marie Flatekval
Acknowledgements: Thank you to my reader and advisor for your patience and grace.

Elena Magyarosi
Psychology and Spanish Language
How to Foster Your Adopted Child's Racial Identity: A Guide for Parents
Abstract: The positive attention and recognition of a child's racial background are crucial to the formation of their identity and self esteem (Gobeil, 2022). A parent can help foster their child's sense of racial identity by using the Cultural-Racial Identity Model, engaging in a color conscious blind parenting style, racial socialization, and exposure to media. By using these methods, parents can help boost their children's self esteem, mental health, and sense of identity.
Sponsor: Professor Leah Warner **| Reader:** Professor Paula Straile-Costa
Acknowledgements: Thank you to Professor Warner and Professor Straile-Costa for helping me develop my project!

Rhisha Mohin
Nursing
Leadership Style: Affect on Quality of Care in Healthcare Settings
Abstract: In a constantly changing environment, healthcare organizations require efficient leaders to improve the quality of care patients receive, ultimately increasing patient satisfaction and preventing adverse outcomes. Ten high-quality studies were examined in this literature review- five systematic reviews, four cross-sectional studies, and one randomized controlled trial- to determine how leadership styles affect the quality of care delivered in healthcare settings. Databases such as CINAHL, PubMed, EMBASE, and Medline were included in the search strategies. All ten studies concluded that there is a relationship between the type of leadership healthcare workers utilize and the effectiveness of care to patients, regardless of the healthcare setting. While all studies acknowledged transformational leadership as the most effective style to promote productivity, motivate nurses, technicians, and providers, and deliver high-quality patient-centered care, some articles found transactional leadership to also be effective- depending on the situation. In the studies that examined laissez-faire leadership, the style was ineffective in providing positive outcomes for both healthcare workers and patients. This paper aims to suggest the

importance of leadership in healthcare organizations in providing the best patient-centered care and maximizing the potential and productivity in healthcare organizations.
Sponsor: Dr. Patrick Mattis **| Reader:** Dr. Alice Park
Acknowledgements: I would like to thank Dr. Mattis and Dr. Park for their time, guidance, and invaluable patience in making this research possible.

Victoria Niedbal

Marketing, minor in International Business
The Use of Personalization in Email Marketing and its Effect on Consumer Engagement within the Automotive Industry
Abstract: This study investigated the effect of personalization in email marketing on customers' level of engagement within the automotive industry. Personalized emails are a form of customer relationship management systems used to create greater value-based interactions with customers. A field experiment, that entailed sending first name personalized email newsletters to 367,000 MINI USA owners and prospects, was conducted. The goal of this study was to analyze and compare each group's engagement behaviors and determine how personalization plays a role in customer-brand interactions. Despite an increase in BAU groups interactions, the study found no significant difference amongst the various groups of owners and prospects in terms of level of engagement due to personalized emails.
Sponsor: Dr. Kathryn Zeno **| Reader:** Dr. Malavika Sundararajan
Acknowledgements: I would like to express my gratitude and appreciation to Dr. Zeno and Dr. Sundararajan for their constant support and guidance in the construction of this paper.

Nashari Payano

Nursing, minor in Spanish Language Studies
Quality of Life in Children with Hydrocephalus: A Literature Review
Abstract: Experienced by roughly 1 million people in the United States, hydrocephalus is a neurological condition characterized by an increase in cerebrospinal fluid (CSF) in the ventricles of the brain that often leads to an increase in intracranial pressure (Zimmerman et al., 2020). As a result of the difficulty in understanding hydrocephalus, there is limited research on the

effects this condition has on patients. This study reviews the current available literature on the quality of life in children living with hydrocephalus and highlights the importance of this research for the nursing profession. This study has been done to raise awareness to an area of pediatric nursing that has often gone overlooked. While it is still imperative to focus on the child's illness and facilitate their healing, total wellbeing can not be accomplished if quality of life is not assessed. Pediatric hydrocephalus patients have often not known a life without the condition, however this does not mean that they do not need support from nurses and providers to promote their overall health. This study demonstrates that a team approach to holistic care for this population is extremely important.

Sponsor: Professor Julia Fitzgerald **| Reader:** Professor Anne Marie Flatekval
Acknowledgements: I would like to extend my sincere gratitude to my Sponsor, Dr. Fitzgerald, and my Reader, Dr. Flatekval, for their unwavering commitment and belief in this project, which has made this endeavor possible, and I would like to recognize my little sister who is my own hydrocephalus hero, who has given me the passion to raise awareness to this issue.

Maya Peacock
Mathematics

Stochastic Resonance and Using Colored Noise to Increase Concentration

Abstract: The purpose of this study is to assess the efficacy of using specific frequencies bands of auditory signal to facilitate focused and sustained attention in college-aged adults while studying. Stochastic resonance theory suggests that one can amplify, and correctly identify, a signal in the midst of specific frequencies and intensities of noise thus enhancing the signal to noise ratio (SNR). In humans this serves to facilitate attention to the signal and inhibit attention to irrelevant stimuli. Research suggests spectrums of sounds most reliably shown to increase focused attention are white (all frequencies audible to the human ear at equal intensity), pink (lower tones, intensity decreases at a specific rate) and brown noise (variable frequency and intensity). 134 college-aged students (113 females, 13 with ADD or ADHD) were randomly assigned to 1 of 4 conditions (no noise, white, pink or brown noise) and asked to listen to the spectrum via headphones as they read a passage and responded to comprehension questions or solve math problems. Environmental sounds such

as “conversations” or music were also piped in during the session. Results suggest that usage of any three of the frequencies provides an increased level of concentration.
Sponsor: Dr. Naseem Choudhury **| Reader:** Dr. Debbie Yuster
Acknowledgements: I would like to thank the SSHS and TAS staff, Ramapo College Honors Program, Dr. Choudhury and Dr. Yuster for their support in this research.

Samikshya Pokharel
Biochemistry
Introducing practical learning through “Experimental Demonstration of the Saponification Process” in 5 government schools of Nepal.
Abstract: The objective of the project was to offer practical laboratory experience to students unfamiliar with lab settings. Among the five participating schools, three lacked any laboratory facilities, while the remaining two possessed some lab equipment that had never been utilized for educational purposes. Despite most students coming from economically disadvantaged backgrounds and 85% aiming for minimum wage jobs abroad, the experiment led to a significant rise in STEM field interest, with 74% expressing newfound curiosity compared to the initial 18%, prompting the continuation of lab sessions for future classes.
Sponsor: Professor Sarah Carberry **| Reader:** Professor Robert Mentore
Acknowledgements: I express my heartfelt gratitude to the TAS Research Honors Program, sponsor Dr. Sarah Carberry, reader Dr. Robert Mentore and all the principals of five schools for their support throughout the process.

Melissa Priester
Nursing
Performing Perfection: The Psychophysiological Impact of Ballet Culture
Abstract: The nature of ballet as an aesthetic performance art has led to a culture that cultivates perfectionism, decreased self-esteem, and inaccurate self-perceptions related to body image. This can lead to a variety of effects on dancers’ physical and mental health, including eating disorders. In order to adjust this culture and improve the physical and emotional well-being of ballerinas, valuing diversity and limiting emphasis on aesthetic appearance is

necessary. Focused education regarding nutrition and mental health should also be provided to encourage positive relationships between dancers and their bodies, in particular for female ballerinas in their adolescence.
Sponsor: Professor Peter Campbell **| Reader:** Professor Yvette Kisor
Acknowledgements: I would like to express my sincerest gratitude to my Faulty Sponsor Professor Peter Campbell and my Faculty Reader Professor Yvette Kisor for their guidance, insight, and support which aided me in the completion of this project.

Demitra Rooyakkers
Biology, minor in Spanish Language Studies
Evolution of G-quadruplex forming motifs in recent SARS-CoV-2 variants
Abstract: SARS-CoV-2 has had an unprecedented impact on global health due to its rapid emergence of viral variants. The development of effective strategies to target the virus is contingent upon knowledge of the complex biology of the virus and its pathogenicity within a host cell. Its replication, translation, and viral assembly processes can be regulated by secondary structures which either inhibit or aid in these processes. The cis-regulatory motif called a G-quadruplex can play significant roles in gene regulation and viral replication. A G-quadruplex is a three-dimensional structure formed by guanine rich nucleic acids. The purpose of this study was to determine if G-quadruplexes can influence evolution of SARS-CoV-2. Using computational methods, we identified Quadruplex forming G-Rich Sequences (QGRS) in both the positive and negative strands of the Wuhan genome. We further studied these QGRS in six current variants and compared the data with multiple sequence alignments. Upon comparison, we identified nine QGRS in the negative strand of the Wuhan variant, two of which were present in the Wuhan variant but absent in the current variants. Our data suggests that the G-quadruplex forming sequences in the Wuhan genome possessed regulatory capabilities which were not favored in the evolution of the virus.
Sponsor: Dr. Paramjeet Bagga **| Reader:** Dr. Scott Frees
Acknowledgements: I would like to thank the College Honors Program for this opportunity.

Wanda Sarbak

Nursing, minor in Public Health

Applications of Mindfulness in Reducing Nurse Burnout

Abstract: Mindfulness is a mental state where an individual is consciously aware of their thoughts and their attention. It has been used to reduce stress in the general public, as well as in people who struggle with anxiety and depression. In the context of nursing, it can be used to reduce nurse burnout, which has numerous negative effects on the nurse, patient, and healthcare organization. Burnout can lead to increased rates of depression, anxiety, post-traumatic stress disorder, increased poor patient outcomes, and increased costs for healthcare organizations. Different Mindfulness-Based Intervention programs have been tried to determine their effectiveness in both helping nurses reduce their stress and patients reduce their symptoms. This is an important topic that needs to be discussed because nurse burnout has catapulted since the COVID-19 pandemic, which has led to a nurse shortage. A nurse shortage further puts patients at risk for poor outcomes and more complications. If nurses are aware of mindfulness practices, they will be better equipped to handle nurse burnout and will be able to guide patients in mindfulness practices to produce better health outcomes.

Sponsor: Dr. Anne Marie Flatekval **| Reader:** Dr. Julie Fitzgerald

Acknowledgements: I would like to thank my advisor Dr. Flatekval and my reader Dr. Fitzgerald for their support in this project!

Mia Schutz

Visual Arts: Electronic Arts and Animation

Mixed

Abstract: In Mixed, I analyzed my parents' story by using audio from a conversation regarding their complex feelings of meeting each other's families. For this piece I wanted to combine the different skills that I learned in these past four years into one work, which is animation and painting. Using a projector, I was able to combine both painting and digital animation into a piece that exists in both the physical and digital world. The projection allowed me to make the canvas come to life by having ice cream come swirling out of the painted machine. This piece allows the audience to view both painting and

animation in a unique way while also giving them a new perspective from which to experience the story.
Sponsor: Professor Ann LePore **| Reader:** Professor Jacquelyn Skrzynski
Acknowledgements: I would like to thank Ann LePore and Jacquelyn Skrzynski, as well as my parents, for all of their help with this project.

Amravi Tarachandani
Biology
Genotypic Analysis of ATF1, ATF2, and IAH1 on Yeast Brewing Strains
Abstract: Yeast is not only one of the most important organisms for understanding biology, but also plays a crucial role in the beer brewing industry. The various strains allow for differences in flavor and aroma found in many beers today. ATF1, ATF2, and IAH1 are three yeast genes that were studied due to their influence on flavor and aroma as they produce isoamyl acetate and ethyl acetate to create banana and fruity notes enjoyed in beer. This experiment aimed to determine the presence of mutational differences in the IAH1, ATF1, and ATF2 genes within ten different brewing yeast strains. Gene sequencing was utilized to identify and analyze the genetic differences between strains. Specifically, polymerase chain reactions (PCR) of ATF1, ATF2, and IAH1 were carried out and results were sent to Psomagen for DNA sequencing. The results were then analyzed using a bioinformatics software called ApE, which locates mutations within each of the yeast strains. Throughout this experiment, many mutations were located in each yeast strain, some more profound than others. Future experimentation would consist of genome modification to understand the significance of the profound mutations on the production of isoamyl acetate and ethyl acetate.
Sponsor: Dr. Joost Monen **| Reader:** Dr. Kokila Kota
Acknowledgements: Thank you to Dr. Joost Monen for his instruction, support, and patience throughout this process.

Anagha Brahmajosyula
Biology
Genotypic Analysis of ATF1, ATF2, and IAH1 on Yeast Brewing Strains
Abstract: Compared to many other organisms, yeast plays an integral role in understanding biology. Yeast also has a major use in the beer brewing industry.

Different strains provide different flavors and aromas that give beer its endless tastes and smells. The genes ATF1, ATF2, and IAH1 were studied due to their significant impact on flavor and aroma through their role in the production of isoamyl acetate and ethyl acetate, providing banana and fruity aromas and flavors. The aim of this experiment was to determine the presence of allelic differences in ATF1, ATF2, and IAH1 between ten different yeast strains. PCR of the gene sequences in the different strains was performed and the results were sent to Psomagen for DNA sequencing. Gene sequencing was used to obtain nucleotide sequences. Results were then analyzed through a bioinformatics tool, known as ApE, to find the location and analyze mutations in each yeast strain. Through experimentation, many mutations were located in certain yeast strains. Future experimentation would be utilized to conduct further gene sequencing of unsuccessful yeast strains and genome modification to gain a better understanding of the importance of certain mutations in their production of different esters.

Sponsor: Dr. Joost Monen **| Reader:** Dr. Kokila Kota
Acknowledgements: Thank you to Dr. Joost Monen for his instruction, support, and patience throughout this process.

Avantika Thakur
Biology

Genotyping Analysis of ATF1, ATF2, and IAH1 on Yeast Brewing Strains

Abstract: Yeast is one of the most important organisms that is used in understanding biology. Yeast also plays a major role in the beer brewing industry. Yeast allows for differences in flavor and aroma found in many beers today. ATF1, ATF2, and IAH1 were studied due to their influence on flavor and aroma as they produce isoamyl acetate and ethyl acetate in order to create banana and fruity notes enjoyed in beer. The aim of this experiment was to determine the presence of allelic differences in the ATF1, ATF2, and IAH1 genes within ten different yeast strains in the brewing industry. Gene sequencing was utilized in order to analyze the genetic differences between these strains. Specifically, PCR reactions of ATF1, ATF2, and IAH1 were conducted and results were sent to Psomagen for DNA sequencing. Results were then analyzed using a bioinformatics software called ApE. ApE was utilized to locate and analyze mutations within each of the yeast strains. Through this experiment, many

mutations were located in certain yeast strains. Future experimentation would consist of further gene sequencing of unsuccessful strains and genome modification in order to understand the significance of certain mutations on the production of isoamyl acetate.
Sponsor: Dr. Joost Monen **| Reader:** Dr. Kokila Kota
Acknowledgements: Thank you to Dr. Joost Monen for his instruction, support, and patience throughout this process.

Alisa Varughese
Finance, minor in Business Analytics and Information Technology Management
Political Activism & Stock Market Participation Amongst Gen-Z
Abstract: This study explores the relationship between stock market participation and political activism among young adults. It aims to uncover the factors influencing financial decisions and civic engagement. The hypothesis suggests that individuals engaged in politics are more inclined to invest in financial markets. Using voting patterns and awareness of political events, political activism and stock market. Participation was measured among 103 Ramapo College students aged 18 to 22. Findings reveal that students actively following current events are more likely to engage in investment activities. And that social media, particularly Instagram, emerges as a primary news source for many respondents. However, it's noted that other factors like income level and risk tolerance may also influence investment behavior.
Sponsor: Professor Stephen Larson **| Reader:** Professor Jason Hecht
Acknowledgements: I would like to express my heartfelt gratitude to Professor Larson and Professor Hecht for their invaluable support and expertise throughout this research process.

Jenna Vesey
Bioinformatics, minor in Neuroscience
Designing a Novel Yeast Brewing Strain Using CRISPR-Cas9 Genome Engineering
Abstract: Our research looks into the production of isoamyl acetate, a desirable “banana aroma” present in hefeweizen. Yeast converts isoamyl alcohol to isoamyl acetate via an alcohol acetyltransferase produced from the ATF1 and ATF2 genes, while isoamyl-acetate hydrolyzing esterase produced by the IAH1

gene catalyzes the reverse reaction. Our previous work has demonstrated that yeast strains which produce high levels of ATF1 and ATF2 relative to low levels of IAH1 produce higher levels of isoamyl acetate. In an effort to increase production of isoamyl acetate, we hypothesize that down regulating or knocking-out IAH1 completely will generate a strain that produces higher levels of isoamyl acetate. Using a CRISPR-Cas9 system, we aim to knock out IAH1 in a hefeweizen strain in order to test this. To accomplish this, we are employing a three-step cloning process whereby we design an sgRNA to target Cas9 cleavage in the coding region of IAH1 near the start codon, and integrate an mRuby2 reporter gene. This will serve to successfully knockout IAH1 while also generating a strain that can provide insight for future studies. With the newly constructed strain, we aim to compare the wild-type and mutant strain in side-by-side fermentation studies and examine isoamyl acetate production.
Sponsor: Dr. Joost Monen **| Reader:** Dr. Ashley Stuart
Acknowledgements: I would like to thank Dr. Joost Monen and Dr. Ashley Stuart for their help with all of my research and my future endeavors.

Cassidy Wade

Weina Xiao
Nursing
Application of Herbal Supplements in Anxiety, Depression, and Stress Related Disorders
Abstract: The purpose of this literature review considers the effects of herbal supplements and its contingency to improve the status of anxiety, depression, and stress-related psychiatric processes. In recent years, the increased rise of individuals with mental health conditions has set a precedent for healthcare providers to find alternatives for patients who may seek treatments that are accessible and efficient. The focus on herbal supplements derived from the idea that this form of medicine has been widely practiced by humans throughout time in various cultures worldwide. The implementation of herbal supplements alone should not suffice as treatment, rather a subsidy to aid in bettering the conditions of mental health. This literature review will explore the latest research on the role of herbal supplements and its influence on the patients who are medicated with this treatment. This research was conducted to

evaluate current data points and provide potential application of herbal supplements to associated disorders. The articles' data need to establish a relationship between mental health disorders and application of herbal medicine, specifically ashwagandha and valerian. The results from the extracted articles will be used to review and evaluate the usefulness of herbal supplements and the potential impact, if significant, on patients.

Sponsor: Dr. Julie Fitzgerald **| Reader:** Dr. Lorraine Santangelo

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