

15th Annual FAU Broward Student Research Showcase



FLORIDA ATLANTIC UNIVERSITY

Broward Campuses

BROWARD STUDENT RESEARCH SHOWCASE 2025

Celebrate the creativity and hard work of our student scholars as they present their research and creative projects at the 15th Annual Broward Research Showcase! Stroll through innovative posters and projects or attend some of their spectacular presentations.

THURSDAY, OCTOBER 30, 2025

9:00 AM - 12:30 PM

FAU DAVIE CAMPUS



Thursday, October 30, 2025

9:00 AM – 12:30 PM

Davie West Building, First Floor

3233 College Ave.

Davie, FL 33314

Email: browardsymposium@fau.edu

Website [HERE](#)



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Program Overview

Celebrating 15 Years of Student Research Excellence

Since its founding in 2010, the **Broward Student Research Showcase** has served as a cornerstone event for cultivating academic excellence, innovation, and collaboration among emerging scholars. Now in its 15th year, the Showcase continues to fulfill its mission of preparing students for professional research careers by fostering essential skills such as academic perseverance, critical thinking, effective communication, and creative problem-solving.

This annual symposium provides a dynamic platform for both undergraduate and graduate students to present their research and creative projects to a diverse audience that includes faculty, staff, peers, and members of the broader community. It encourages interdisciplinary exploration and celebrates the intellectual curiosity that drives discovery across all fields of study.

The Showcase proudly features student researchers from **Florida Atlantic University**, **Broward College**, and **Nova Southeastern University**, highlighting the collaborative spirit and academic synergy among institutions in the region. Through this event, students gain valuable experience in presenting their work and engaging in scholarly dialogue— all of which are vital components of academic and workforce development.

Participants have the opportunity to choose between two presentation formats:

- A **narrated poster presentation**, allowing for visual storytelling and detailed exploration of their research process and findings.
- An **8-minute oral presentation**, offering a concise and impactful overview of their work, followed by audience interaction and discussion.

As we celebrate this milestone year, we honor the dedication of our student researchers, faculty mentors, and institutional partners who have contributed to the growth and success of the Broward Student Research Showcase. This event not only reflects the achievements of our students but also reinforces our shared commitment to fostering a vibrant culture of inquiry, creativity, and academic excellence.

Submission Statistics for the 2025 Broward Student Research Showcase

This year's Broward Student Research Showcase features an impressive array of submissions, showcasing the talent and dedication of students from various institutions. Here's a breakdown of the statistics:

- **Total Submissions:** 44 (17 group submissions)
- **Participating Institutions:**
 - Florida Atlantic University: 27
 - Broward College: 14
 - Nova Southeastern University: 3
- **Presentation Formats:**
 - Oral Presenters: 4
 - Poster Presenters: 40
- **Academic Levels:**
 - Doctoral Students: 8
 - Masters Students: 3
 - Undergraduate Students: 33
- **Total Participants (including group members):** 78

Acknowledgments

We extend our deepest appreciation to the dedicated faculty mentors who continue to support student research and creative scholarship. Your commitment to guiding students through the process of inquiry and discovery plays a vital role in shaping their academic journeys. By fostering intellectual curiosity and providing mentorship, you help students transform ideas into impactful projects that contribute meaningfully to their fields of study.

We also wish to recognize the invaluable contributions of faculty and staff who generously volunteer their time and expertise to ensure the success of this event. Your behind-the-scenes efforts—from the event planning to on-site support—greatly enhance the quality of the showcase and create an environment that encourages meaningful dialogue and collaboration among participants.

To our student presenters, thank you for your enthusiasm, hard work, and willingness to share your research and creative endeavors. Your presentations reflect not only your academic growth but also the spirit of innovation and inquiry that defines the FAU community. Your participation is a testament to the power of undergraduate research and its role in shaping future scholars and professionals.

Together, your contributions make this event a celebration of learning, discovery, and collaboration. We are truly grateful.

Agenda

9:00 AM – 12:00 PM	On-going Registration
9:30 AM – 9:45 AM	Opening Remarks – Dr. Colin Polsky, Associate Vice President for Academic Affairs, Broward Campuses <i>Location - Room DW 103</i>
	Poster Presentations <i>in the Main Hallway</i>
9:45 AM – 11:00 AM	Poster Session 1
11:15 AM – 12:30 PM	Poster Session 2
	Oral Presentations <i>Location - Room DW 103</i>
10:30 AM	Oral Presentation 1
11:00 AM	Oral Presentation 2
11:30 AM	Oral Presentation 3
12:00 PM	Oral Presentation 4

FAU Student Resources including Transfer Admissions, Office of Undergraduate Research and Inquiry (OURI), Department of Curriculum and Instruction – Educational Robotics and AI, Christine E. Lynn College of Nursing, and Charles E. Schmidt College of Science are located in the main foyer.

Refreshments are located at the end of the main hallway.



Oral Presentations

10:30 AM	Gender-Based Challenges in the Entrepreneurship Ecosystem <i>Gender-Based Challenges Women Face in Entrepreneurship: The Case of Florida Small Business Development Center at Florida Atlantic University</i>	Tugce Dogan, Doctoral Student, The Dorothy F. Schmidt College of Arts & Letters, Comparative Studies Program, Florida Atlantic University
11:00 AM	Immunotherapy potential for brain metastases <i>Clinical Efficacy of Immune Checkpoint Inhibitors in Glioblastoma and Brain Metastases</i>	Maria Fioletova, Emma Baker, Doctoral Students, College of Osteopathic Medicine, Dr. Kiran C. Patel College of Allopathic Medicine, Osteopathic Medicine, Allopathic Medicine, Nova Southeastern University
11:30 AM	Family Perspectives on Life With Disabilities <i>Quality of Life Implications for Families with Physical Disabilities</i>	Robin Davis, Masters student, College of Education, Special Education: Applied Behavior Analysis, Florida Atlantic University, Mentor: Sharon Darling
12:00 PM	The Application of AI in Neurology <i>How is AI Being Applied in Neurology?</i>	Annabelle Nuttall, Inaaya Alamgir, Ayesha Sadiq, Matthew Velez, Undergraduate Students, Business Administration, Computer Science, Psychology, Biomedical Engineering, The College Academy at Broward College, Mentor: Dr. Jodie Weinstein

D4: Gender-Based Challenges in the Entrepreneurship Ecosystem

Gender-Based Challenges Women Face in Entrepreneurship: The Case of Florida Small Business Development Center at Florida Atlantic University

Tugce Dogan, Tdogan2020@fau.edu, Doctoral Student, The Dorothy F. Schmidt College of Arts & Letters, Comparative Studies Program, Florida Atlantic University

Women entrepreneurs have to face the challenges that come with being an entrepreneur, besides the challenges that come from their gender and the roles assigned to them by society, all at the same time. This paper aims to explore, understand, and interpret the gender-based challenges of the Florida Small Business Development Center at Florida Atlantic University consultants' clients (entrepreneurs). Florida SBDC consultants have been interviewed in this research to find out successes and/or failures in business life and innovation based on gender, and examined the reasons why and what factors contribute to making women successful or unsuccessful if they are. The findings of these interviews suggest that financial challenges do not pose a significant obstacle for entrepreneurs. However, scholars argue that women have limited access to finance. The consensus is that women tend to be detail-oriented, which can positively or negatively impact their success.

D8: Immunotherapy potential for brain metastases

Clinical Efficacy of Immune Checkpoint Inhibitors in Glioblastoma and Brain Metastases

Maria Fioletova, Emma Baker, mf2334@mynsu.nova.edu, eb1825@mynsu.nova.edu, Doctoral Students, College of Osteopathic Medicine, Dr. Kiran C. Patel College of Allopathic Medicine, Osteopathic Medicine, Allopathic Medicine, Nova Southeastern University

Brain tumors, including glioblastoma (GBM) and metastatic lesions, remain highly aggressive and resistant to treatment, with poor prognoses. Immune checkpoint inhibitors (ICIs) such as pembrolizumab, nivolumab, and ipilimumab enhance T-cell anti-tumor responses and are increasingly studied in neuro-oncology. An analysis of 80 clinical trials identified 14 reporting results for brain metastases and 6 for GBM, using ICIs alone or in combination with radiotherapy, chemotherapy, or oncolytic viruses. Ipilimumab demonstrated efficacy against melanoma brain metastases, particularly when combined with nivolumab, and was safe alongside radiotherapy. Pembrolizumab showed benefit in non-small cell lung cancer (NSCLC) and melanoma brain metastases, with addition of surgery or radiation for large lesions. In GBM, novel approaches such as anti-LAG-3 regimens and viral therapies showed promise, while large trials of nivolumab with chemotherapy failed to improve survival. Overall, ICIs represent a promising strategy for brain metastases but remain limited in GBM, emphasizing the need for biomarker-driven, combination therapies.

M1: Family Perspectives on Life With Disabilities

Quality of Life Implications for Families with Physical Disabilities

Robin Davis, robindavis2025@fau.edu, Masters student, College of Education, Special Education: Applied Behavior Analysis, Florida Atlantic University, Mentor: Sharon Darling

As disability has a direct impact on many of the most prominent factors of quality of life such as mental and emotional health, relationship quality, and financial security. (Dowling & Dolan, 2001), it can be determined that individuals with disabilities, and the families that support them, feel its effects on some

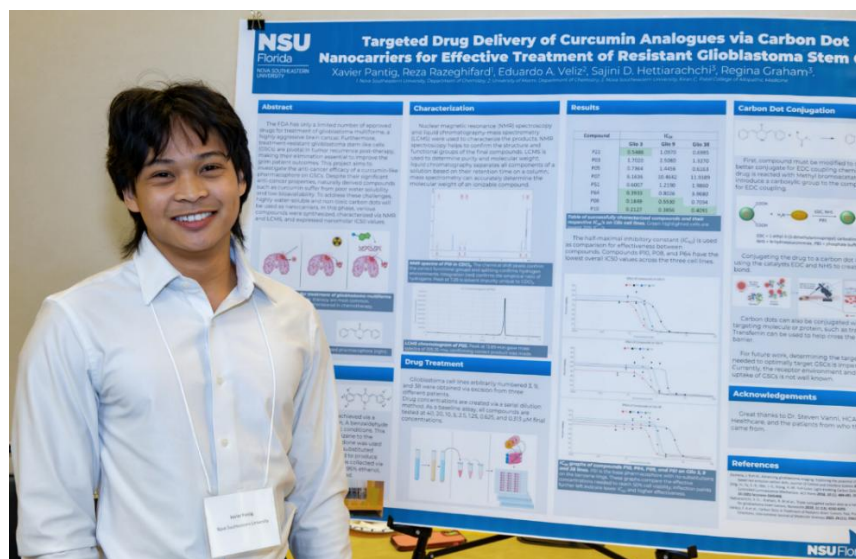
level. While disability impacts to the family are often experienced within the home, social consequences of disability decrease satisfaction with social interaction (Çaynak et al., 2022). Stigma is often applied not only to the members who bear the stigmatizing quality, but it is also applied to the 'wise', or the individuals with whom the stigmatized individual associates (Goffman, 1963). In order to gain a thorough understanding of the ways in which physical disability shapes family functioning, further exploration of physical disability as it relates to each quality-of-life component is necessary. A brief literature review and separate book review were conducted to enhance the research objective with contextual data pertaining to multiple aspects of physical disability research as well as interpersonal perspectives related to the research question as highlighted by testimonies of families who support children with disabilities. Findings from the literature review and book review mostly support the thesis that physical disabilities create emotional, physical, financial, and logistical challenges.

U18: The Application of AI in Neurology

How is AI Being Applied in Neurology?

Annabelle Nuttall, Inaaya Alamgir, Ayesha Sadiq, Matthew Velez, nutta1@mail.broward.edu, alami1@mail.broward.edu, sadia7@mail.broward.edu, velem51@mail.broward.edu, Undergraduate Students, Business Administration, Computer Science, Psychology, Biomedical Engineering, The College Academy at Broward College, Mentor: Dr. Jodie Weinstein

Artificial Intelligence's (AI) ability and versatility have grown exponentially in recent years, especially in medicine. There is limited awareness of what AI is and how it is being used, leaving major gaps in education in the medical field. By conducting a literature-based review and industry interviews, we aimed to identify how AI is being applied in neurology, specifically in Amyotrophic Lateral Sclerosis (ALS), Parkinson's disease, and paralysis. The shortage of reported successful implementation suggested that AI is still in the early developmental stages of research and utilization. Additionally, interviewed professionals shared their success while cautioning against the shortcomings of AI, such as accessibility, privacy, and reliability. Despite this, many cases have shown breakthroughs in treatment and diagnosis. It is crucial for medical professionals to be educated on AI's growth, so that AI can be responsibly implemented into the field while advancing patient treatment.



Poster Presentations

D1: Body Dissatisfaction Anticipates Heightened Alcohol Misuse Across

A parallel process growth curve model examining the longitudinal associations from body dissatisfaction to changes in alcohol misuse over the course of a school year.

Molly Selover, mselover2023@fau.edu, Doctoral Student, Charles E. Schmidt College of Science, Experimental Psychology, Florida Atlantic University, Mentor: Dr. Brett Laursen

Alcohol misuse can be a product of body dissatisfaction. Adolescents may drink to cope with negative feelings about their bodies (Nieri et al., 2005) or to reduce anxiety that accompanies poor body image (Aydin et al., 2018). Among young adults, longitudinal associations have been established such that low body image forecasts increases in alcohol consumption (Di Tata et al., 2024). Concurrent correlational studies (e.g., Jones et al., 2018) suggest that these associations extend downward into adolescence, when puberty elicits heightened concern about appearance (Volker et al., 2015). The present study is the first of its kind to examine the longitudinal associations from body dissatisfaction to changes in alcohol misuse over the course of a school year.

D2: Desired friends reflect ideals, not realities

The Friends They Have and the Friends They Want: Why Friendship Aspirations Usually Fail

Lucinda Sherrod, lsherrod2024@fau.edu, Doctoral Student, Charles E. Schmidt College of Science, Psychology, Florida Atlantic University, Mentor: Brett Laursen

Desired friends represent aspirational relationships. But are they realistic? Two longitudinal studies were conducted, each with two waves of data within a single school year. Participants included 340 boys and 385 girls, ages 10-14, from Florida (U.S.) and Lithuania. Participants identified and rank-ordered classmates who were desired friends and existing friends. Peer nominations assessed status and

attributes (i.e., academic achievement, attractiveness, athleticism, fun, popularity, unpopularity). Few (3.1-13.4%) desired friends became reciprocated friends. Desired friends had higher status and more favorable attributes than (a) those not desired as friends and (b) those who desired them as friends. Youth had more in common with existing friends than desired friends. We conclude that desired friends represent unattainable ideals rather than realistic interpersonal goals.

D3: best friends share the greatest similarity

Best Friends are More Similar than Other Friends

Sophia Montejo, smontejo2025@fau.edu, Doctoral Student, Charles E. Schmidt College of Science; Department of Psychology, Experimental Psychology, Florida Atlantic University, Mentor: Dr. Brett Laursen

Similarity should be a reflection of closeness, such that best friends share the most resemblances. The present study was designed to test this unexamined assumption. Participants included 133 girls and 106 boys, ages 6-13, attending public schools in Florida. Participants completed a peer nomination survey, identifying classmates who best fit descriptors for status (Popular, Unpopular, Accepted, Rejected) and reputation (Fun, Attractive, Athletic, and Disruptive). All participants made at least 5 friend nominations. Friend rank reflected the order of outgoing nominations, and similarity scores were calculated for each peer status and peer reputation variable. As hypothesized, children and adolescents were more similar to those identified as best friends than to lesser friends. Given that friends are an important source of influence, especially during middle school (Laursen & Veenstra, 2022), distinguishing best friends plays a crucial role in determining which peers will have the greatest impact on an individual.

D5: Heat, hunger, and the roots of personality

Testing for Effects of Thermal Stress During Incubation on Avian Development

Ray Pressman, rpressman2024@fau.edu, Doctoral Student, Charles E. Schmidt College of Science, Integrative Biology Doctorate Program, Florida Atlantic University, Mentor: Dr. Rindy Anderson

Early-life environmental conditions can have lasting effects on animal physiology and behavior. In birds, incubation temperature is a critical developmental factor, especially as climate change increases exposure to heat stress. This study tests how elevated incubation temperature influences begging behavior and personality development in zebra finches (*Taeniopygia guttata*). Begging is a key parent-offspring communication signal, while personality reflects consistent individual differences in behavior that affect fitness. We ask: (1) does begging intensity during early development predict later-life personality traits along the proactive-reactive spectrum, and (2) how does heat stress during incubation alter begging and personality outcomes? Using controlled incubation treatments and standardized behavioral assays, we predict that heat-stressed chicks will show reduced begging intensity and altered personality development, while more intense beggars will develop more proactive behavioral profiles. This work links early-life stress, behavioral development, and fitness, providing insight into how avian populations may behaviorally respond to rising global temperatures.

D6: Testing the Role of Vocal Performance

Testing the Role of Vocal Performance in Territorial Defense

Lauren Dawson-Scully, ldawsonscull2021@fau.edu, Doctoral Student, Charles E. Schmidt College of Science, Integrative Biology, Florida Atlantic University, Mentor: Dr. Rindy Anderson

Vocal performance, defined by the tradeoff between trill rate and frequency bandwidth, is an honest signal constrained by physiology and used in avian communication. While Swamp Sparrows modulate vocal performance in aggressive contexts, this plasticity has not been tested in the near-threatened Bachman's Sparrow (*Peucaea aestivalis*). I hypothesize that males will match the performance level of rivals, producing higher-performance songs in response to high-performance stimuli. To test this, I will conduct simulated territorial intrusions on 30 males at Jonathan Dickinson State Park, exposing each to one to either high or low performance stimuli. Vocal and behavioral responses will be recorded and analyzed in Raven Pro to quantify frequency bandwidth, trill rate, and deviation from an upper performance limit. Results will clarify whether Bachman's Sparrows adjust song performance during territorial defense, advancing our understanding of how signal honesty and performance tradeoffs shape male competition in songbirds.

D7: Song Development of Lab-Reared Bachman's Sparrows

Song Development in Lab-Reared Bachman's Sparrows (Peucaea aestivalis)

Heather Wolverton, Natalie Martinez, Rachel Allison, Luke Berg, hwolverton2013@fau.edu, nataliemarti2022@fau.edu, rallison2022@fau.edu, lberg2021@fau.edu, Doctoral Students, Biological Sciences, Integrative Biology, Florida Atlantic University, Mentor: Dr. Rindy Anderson

The Bachman's sparrow is a declining species whose diverse song repertoires are understudied. Like most songbirds, Bachman's sparrows learn to sing through a process called vocal learning, which involves recognizing and repeating conspecific songs. We conducted a study using a hand-reared population of Bachman's sparrows that were collected as nestlings and raised in our lab in Davie, Florida. They were exposed to song playback consisting of Bachman's sparrow songs from two different populations and heterospecific songs. We had two separate tutoring periods; one from fledging until 100 days of age, and the second occurring during their first breeding season. Tascams were used to record their singing attempts during and after playback exposure. We analyzed these recordings to see 1) if lab-reared sparrows will differentially learn conspecific song, 2) whether their sensitive learning period is limited to their hatch year, and 3) whether syntax plays a role in song learning.

M2: Child Body-Image Dissatisfaction Elicits Controlling Parenting

Weight Concerns and Body Image Dissatisfaction Elicit Maternal Psychological Control through Escalating Appearance Anxiety

Madeleine Guillont, mguillont2023@fau.edu, Masters Student, Charles E. Schmidt College of Science; Department of Psychology, Psychology, Florida Atlantic University, Mentor: Dr. Brett Laursen

Little is known about child characteristics that elicit psychologically controlling parenting. We tested whether adolescents' weight concerns and body-image dissatisfaction predict increases in perceived maternal psychological control via appearance anxiety. Participants were 723 Lithuanian students (352 girls, 371 boys; ages 11–15) surveyed three times in one school year (~13 weeks apart). Youth reported psychological control (Barber et al., 2005), appearance anxiety (Veale et al., 2013), body-image satisfaction (Harter, 1985), and weight concerns (Schacht et al., 2006). A longitudinal mediation model (SEM, Bayesian estimation) evaluated two indirect pathways. Both were significant: greater body-image

dissatisfaction and weight concerns in fall predicted higher appearance anxiety in winter, which predicted increased psychological control in spring. Findings indicate that child attributes can elicit psychologically controlling parenting, with appearance anxiety providing behavioral cues that trigger parental responses.

M3: Exploring cooperation in monogamous primates

Cognition in pair-living owl monkeys (Aotus nancymae): the role of partner affiliation in the willingness to cooperate to solve a cognitive task

Aaron Mencia, amencia2017@fau.edu, Masters Student, Charles E. Schmidt College of Science, Biological Science, Florida Atlantic University, Mentors: Dr. Kate Detwiler, Dr. Christy Wolovich

Animal cooperation studies explore collaboration and problem-solving mechanisms. Whereas most research using cooperative tasks, where individuals work together for a reward, has focused on group-living primates, this study tested pair-bonded owl monkeys (*Aotus nancymae*), known for food sharing and biparental care. We tested if owl monkeys performed like group-living species and if affiliation predicted success. Ten male–female pairs housed at the DuMond Conservancy (Miami, FL) were assessed through three phases: habituation, individual performance, and cooperative performance, using a loose string task requiring both monkeys to pull simultaneously for a food reward. Females participated more than males during individual performance. Few cooperative attempts occurred during phase three, with no successes. Two pairs made unsuccessful attempts, one being a highly affiliative pair with a female and a male not originally from the field site. These findings suggest partner origin and pair dynamics may influence participation.

U1: Observing Diverse Youth Social-Cognitive Growth

Investigating Social-Cognitive Development in Youth Diagnosed with Autism and Related Disabilities

Alexandra Hickey, hickeya2023@fau.edu, Undergraduate Student, Charles E. Schmidt College of Science; Department of Psychology, Neuroscience; FAU High, Florida Atlantic University, Mentor: Alexandria May

This project examines social-cognitive development in youth diagnosed with autism and other related disabilities. The study was conducted through structured activities and mentor interactions within the FAU Center for Autism & Related Disabilities Program: iRISE². Over multiple sessions, youth engagement in activities—including communication, skill-building, creative projects, and other interactive exercises—was assessed. Program mentors and facilitators directed these activities, providing guidance and support to the youth. Observations focused on which activities and approaches promoted the most sustained and impactful engagement, along with meaningful social interaction between mentors and their protégés. Findings from this study aim to identify certain methods that enhance social-cognitive development, guide best practices for the iRISE² program and similar future initiatives, and highlight strategies that maximize learning as well as social and psychological growth for youth with diverse needs.

U2: Ethical frameworks for organ distribution fairness

Life on the Waiting List: Ethics of Organ Allocation

Haleigh Gibson, gibsh8@mail.broward.edu, Undergraduate Student, Department of Humanities, Nursing, Broward College, Mentor: Joshua Kimber

This project examines the ethical challenges of organ allocation during scarcity. In 2024, more than 48,000 transplants were performed in the United States, and over 106,000 patients remained on the waiting list, with roughly 90% awaiting kidneys. This shortage raises a crucial ethical question: how should scarce donor organs be distributed fairly? To explore this, the project analyzes three major ethical frameworks. Utilitarianism seeks to maximize outcomes and efficiency but can disadvantage severely ill patients. Deontology upholds fairness and equal dignity but may ignore prognosis and outcomes. Rights ethics emphasizes protecting vulnerable groups and supporting justice but struggles when rights conflict. The conclusion affirms that no single framework resolves fairness alone; effective allocation requires balancing efficiency, dignity, and rights within biological constraints.

U3: Linking Beccaria's Jurisprudence to Contemporary Bioethics

This essay explores Cesare Beccaria's legal philosophy, linking his opposition to torture and capital punishment with contemporary bioethics, and highlighting human dignity as the guiding principle bridging historical and modern ethics.

Olivia Forlini, oforlini2023@fau.edu, Undergraduate Student, The Dorothy F. Schmidt College of Arts and Letters: Department of Languages, Linguistics, and Comparative Literature, Florida Atlantic University, Mentors: Professor Alessio Giovane, Dr. Ilaria Serra

This essay analyzes the treatise "On Crimes and Punishment" by Cesare Beccaria, an Italian author of the Enlightenment. Specifically, it discusses why Beccaria wrote this treatise and how it influenced both his era and the future of jurisprudence. It examines the ideas that Beccaria was against: death penalty, torture, and other parts of the historical Italian justice system. It illustrates how Beccaria's ideas, especially the death penalty and torture are connected to bioethics. This paper agrees with Beccaria in opposing the death penalty and is supported with authors such as Foucault, Cadoppi, and Bessler. There was a gap linking Beccaria to bioethics as this field was not developed in the 18th century. Thus, a bioethical reflection was extrapolated as an extension of human dignity and dignity correlated to the Social Contract. Furthermore, the essay will discuss the punitive alternatives purposed by Beccaria and their supporting ideas.

U4: Instagram's Power in Modern Democracy

Evaluating Social Media Strategies in the 2024 Presidential Campaign: A Focus on Instagram

Maneeha Luqman, Mahiba Bhuiyan, Mluqman2022@fau.edu, mbhuiyan2022@fau.edu, Undergraduate Students, College of Business, College of Engineering & Computer Science, Economics, Computer Science, Florida Atlantic University, Mentor: Kristin Shockley

This study investigates Instagram's influence on the 2024 U.S. presidential election by analyzing content shared through official candidate accounts. Data were collected over six months leading up to the election and categorized by both format (text, image, video) and type (campaign messaging, policy discussions, or personal updates). Engagement metrics such as likes, comments, and shares were recorded to determine which types of content most effectively captured public attention. It is hypothesized that policy-related video posts will generate the highest engagement. The findings aim to

enhance understanding of voter engagement strategies and highlight the growing role of social media in shaping democratic participation.

U5: Visual Design to Enhance STEM Engagement

Visual Design and Communication Strategies for STEM Community Engagement

Alexa Bowden, abowden2022@fau.edu, Undergraduate Student, The Dorothy F. Schmidt College of Arts and Letters, Graphic Design, Florida Atlantic University, Mentor: Dr. David Devraj Kumar

This project explores the FAU STEM Education Lab's community engagement initiatives while highlighting the role of cross-disciplinary collaboration in strengthening these efforts. STEM education lab has a history of successful collaborative community engagement efforts in K-12 schools in Broward and Palm Beach counties. Teacher leadership development among preservice teachers at Florida Atlantic University through STEM community engagement is a few of the outcomes. As a graphic design student, I will research how visual design and communication could contribute to augment outreach strategies. By applying design strategies to outreach materials and engagement efforts, this project demonstrates how creative perspectives can make STEM concepts more approachable and inspiring for K-12 audiences.

U6: GIS, Wildlife Corridor, No Spray Zones

Using Geographic Information Systems to Visualize No Spray Zones in South Florida: Impacts on Wildlife Corridors

Apollo I. Thomas, thoma437@mail.broward.edu, Undergraduate Student, Environmental Science, Broward College, Mentor: Dr. Julie Mura

The United States Fish and Wildlife Service (USFWS) sets criteria for areas of Florida to be prohibited from spraying insecticides targeting mosquitoes-These are commonly known as "no spray zones." This is to prevent areas containing sensitive wildlife from being negatively affected. Florida has law in place which recognizes area of land for conservation planning commonly referred to as a wildlife corridor. This is to allow species to transit throughout the state to help enable genetic diversity.

Geographic Information Systems (GIS) can offer spatial representation of no spray zones, wildlife corridors and areas that lack overlap. This research focusses on Southern Florida, from south of Lake Okeechobee to Key Largo. This visualization allows for identification of wildlife corridor areas not covered by no spray zones to better determine if the current coverage is suitable.

U7: GIS mapping of Asian Citrus Psyllid

Using Geographical Information Systems to Analyze the Spread of Asian Citrus Psyllid and Citrus Greening Disease transmission in Florida

Deshonda Holmes, holmd14@mail.broward.edu, Undergraduate Student, Environmental Science, Broward College

This study will use Geographic Information Systems (GIS) to investigate the spread of the Asian citrus psyllid (*Diaphorina citri*) and citrus greening disease (Huanglongbing, HLB) in Florida. As the primary vector of HLB, the psyllid poses a major threat to the state's citrus industry. Spatial data on psyllid

populations, disease reports, and environmental conditions can be integrated to identify areas at highest transmission risk. GIS mapping and spatial analysis will be used to examine relationships between vector distribution, climate, and citrus production.

Results are expected to demonstrate GIS's value as a tool for predicting, monitoring, and managing vector-borne plant diseases in agriculture. This research will offer a focus on Florida's citrus industry.

U8: GIS Mapping of Tawantinsuyu & Qhapaq Ñan

Integrating Spatial Data and Archaeological Evidence: a GIS Investigation of the Qhapaq Ñan in Tawantinsuyu Territory

Teresa Documet, docut@mail.broward.edu, Undergraduate Student, Anthropology, Broward College, Mentor: Dr. Julie Mura

Tawantinsuyu, the Incan Empire, was once one of the largest civilizations in the ancient world. Stretching across present day Peru, Ecuador, Bolivia, Chile, and Argentina, the empire was connected by a road system called the Qhapaq Ñan that linked major cities.

This work proposes to utilize Geographic Information Systems (GIS) to support archaeological methods. By mapping Incan artifacts and analyzing terrain along the Qhapaq Ñan, GIS can help reveal patterns of trade and movement within Tawantinsuyu. This approach assists to better understand how geography shaped the Inca Empire.

U9: Bioavailability of Myristicin in Seeds

Bioavailability of Myristicin in Nutmeg and its Pharmacological Benefits

Abigail Martinez, Lorena Barros, marta740@mail.broward.edu, pachl17@mail.broward.edu, Undergraduate Student, Physical Sciences, Broward College, Mentor: Dr. Behnoush Memari

Myristicin is a compound found primarily in nutmeg, but also found in other seeds, like star anise and celery seed. Traditional Asian medicine treatments make use of nutmeg oil against abdominal cramps, diarrhea, and insomnia. Myristicin is thought to be primarily responsible for its effects. Many pharmacological benefits have already been identified in myristicin, including the compound being used as an analgesic and anti-inflammatory agent. However, when used in high doses, myristicin can have strong contraindications, since it can have toxic effects. This study aims to compare the bioavailability of myristicin between different forms of nutmeg, while reviewing the benefits of the compound when used in moderation. Myristicin will be isolated through steam distillation and the content will be determined through Nuclear Magnetic Resonance Spectroscopy.

U10: Modeling blood flow through diseased arteries

Computational Modeling of Blood Flow Dynamics in Arteries with Atherosclerotic Plaques Using SOLIDWORKS Flow Simulation for Hemodynamic Analysis and Geometry Optimization

Zayd EL IMANE, ze60@mynsu.nova.edu, Undergraduate Student, College of computing and engineering, Biomedical Engineering, Nova Southeastern University

This research focuses on simulating blood flow through arteries affected by atherosclerotic plaques using SOLIDWORKS Flow Simulation. A 3D arterial geometry was created and modified to include

different plaque formations that replicate various stages of arteriosclerosis. The goal is to analyze how plaque shape, size, and location influence blood velocity, pressure distribution, and overall flow characteristics. Through computational fluid dynamics (CFD), the study provides detailed insights into hemodynamic parameters such as velocity profiles, wall shear stress, and turbulence zones within the arterial lumen. By comparing results across multiple plaque geometries, the project aims to identify critical flow disturbances that may contribute to disease progression and to propose optimized geometrical models for future biomedical analysis. This simulation serves as a step toward improving diagnostic understanding and treatment design for cardiovascular conditions and create a reliable geometry for testing.

U11: Targeting ISR and UPR Pathways in Glioblastoma

Targeting ISR and UPR Pathways in Glioblastoma Stem Cells with Potent Bis-Chalcone Derivatives

Abby Morrill, am5361@mynsu.nova.edu, Undergraduate Student, Halmos College of Arts and Sciences, Biology, Psychology, Nova Southeastern University, Mentor: DR. Regina M. Graham

Background: Glioblastoma (GBM) is a lethal brain tumor driven by therapy-resistant glioblastoma stem cells (GSCs) that depend on stress pathways like the Integrated Stress Response (ISR) and Unfolded Protein Response (UPR). Curcumin affects these pathways but lacks potency and bioavailability.

Methods: Bis-chalcone analogs inspired by curcumin were synthesized and tested against patient-derived GSC lines (Glio 3, Glio 9, Glio 38) using MTS assays (0.1–10 μ M, 72 h). Cytotoxicity in non-tumor mesenchymal stem cells assessed selectivity, while ISR/UPR and apoptosis markers were analyzed by western blot.

Results: The lead analog exhibited potent, selective GSC cytotoxicity ($IC_{50} = 270$ nM), $\sim 100\times$ stronger than curcumin, with minimal non-tumor toxicity. Mechanistic studies showed ISR activation ($\uparrow p-eIF2\alpha$, ATF4, CHOP) and UPR suppression ($\downarrow$ ATF6, no GRP78 induction).

Conclusion: This optimized bis-chalcone analog effectively targets resistant GSCs via ISR activation and UPR suppression, offering a promising GBM therapeutic platform.

U12: Grooming Reveals Hybrid Monkey Social Integration

The Impact of Hybrid Monkey Phenotype on Grooming Behavior and Social Bonding in a Mixed Phenotype Population: A Social Network Analysis Approach

Kari Bohannon, kbohannon2023@fau.edu, Undergraduate Student, Charles E. Schmidt College of Science, Biology, Florida Atlantic University, Mentor: Dr. Kate Detwiler

Hybridization between red-tailed monkeys (*Cercopithecus ascanius*) and blue monkeys (*Cercopithecus mitis*) provides a unique opportunity to examine how phenotype influences social integration in primate groups. This study investigated grooming behavior to assess whether hybrid phenotypes are socially embedded within the group. We analyzed grooming interactions observed by the project's field researcher in Gombe National Park, Tanzania, from 2023-2024, who recorded the phenotype of grooming partners for each interaction. A directed, weighted grooming network was constructed in Gephi (open-source software for network visualization and analysis) to evaluate social integration (degree centrality) and community structure (modularity class). Statistical tests assessed the significance of network patterns. Results showed a significant association between phenotype and community

membership. Hybrid phenotypes were distributed across multiple subcommunities, indicating broad social bonds within the group, which may be influenced by factors other than phenotype, such as kinship, age, and rank.

U13: Songbird communication compared in different temperatures

Song Analysis Abstract

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This study investigated whether vocal performance and song repertoire size in Bachman's Sparrows differs between moderate and hotter temperatures. Bachman's Sparrows are songbirds with high metabolic rates that rely on song for mating and competing for territory. Given that warmer temperatures increase thermoregulatory demands, we hypothesized that there would be reduced vocal performance and song repertoire size in June. Songs were recorded during two periods, March/April and June, using simulated territorial intrusions, and analyzed in Raven Pro Bioacoustics Software for song type variance and vocal performance. Results showed no significant differences between trials in trill rate ($p = 0.791$), frequency bandwidth ($p = 0.204$), or vocal deviation ($p = 0.151$). Additionally, averaged differences in the number of song types produced were not statistically significant ($p = 0.60$). These findings suggest moderate temperature increases did not systematically alter Bachman's Sparrow's song quality.

U14: Behavioral Ecology of De Brazza's Monkey

Behavioral Ecology of Cercopithecus neglectus (De Brazza's Monkey) in Lomami National Park in the Central Congo Basin of the Democratic Republic of the Congo

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Lomami National Park (LNP) supports a wide variety of animal species across tropical lowland rainforest and grassland habitats. *Cercopithecus neglectus* (De Brazza's Monkey) is an understudied primate, leaving gaps in knowledge about its behavioral ecology. Using camera-trap videos collected intermittently between 2013-2021 (10,810 trap days), we studied the behaviors of *C. neglectus* in LNP, documenting activity patterns and sociality. Utilizing an ethogram, we documented when one or more behaviors (e.g., vigilance, grooming, resting, etc.) occurred in an event, resulting in 152 behavioral observations across 86 events of *C. neglectus*. Of these observations, travelling ($n = 70$) and foraging ($n = 34$) behaviors were the most frequently observed. Despite being an arboreal and social species, 7.2% of behaviors occurred on the ground, and most events (85%) involved solitary individuals. These results provide baseline behavioral data for *C. neglectus* in LNP and reveal unexpected terrestrial and solitary tendencies that warrant further investigation.

U15: Alzheimer's research

Evaluation of swip-10 gene in amyloid-beta deposition in an Alzheimer's C.elegans model

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Extracellular Amyloid beta ($A\beta$) plaques are a hallmark of Alzheimer's disease (AD) pathology and promote neurodegeneration. In previous studies, the MBLAC1 gene, which regulates RNA endonuclease activity copper ion homeostasis was found to associate with increased risk for AD and demonstrated reduced expression in the postmortem AD brain. How a reduction of MBLAC1 expression impacts $A\beta$ plaque accumulation is unclear. The glial-expressed *C. elegans* gene swip-10 is the worm ortholog of MBLAC1. We crossed the $A\beta$ plaque-producing strain GMC101 with a swip-10 deletion strain to produce a novel model to study MBLAC1 contribution to AD risk. Using confocal imaging, we quantify $A\beta$ plaque accumulation, paralleled by behavioral evaluation, and thus elucidate the effects of swip-10 mutation on $A\beta$ accumulation. Our model provides a powerful and inexpensive approach to model and elucidate the established link between AD and diminished MBLAC1 gene expression.

U16: Gender Influence on Bystander CPR Performance

Evaluating the Impact of Patient Gender on CPR Performance and Response Among Certified and Non-Certified Individuals

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The study aims to examine the effectiveness of cardiopulmonary resuscitation (CPR) performed by Certified and Non-Certified bystanders and will demonstrate the effects of patient gender on CPR performance. As demonstrated by previous studies, women are proven to be less likely to receive CPR in public by bystanders than men by 14% (Duke Medical School, 2025.) Furthermore, women have a lower discharge survival rate than men by 13.8%. However, these studies do not cover the performance deficit between certified and non-certified individuals. To address this gap, participants will complete a short questionnaire on their CPR experience before performing CPR on either a male or female manikin. Researchers will record compression depth, rate, and reaction time to evaluate performance differences and determine whether training reduces gender bias in CPR response. By identifying whether gender bias affects CPR performance, this study aims to highlight the importance of inclusive and realistic CPR training.

U17: Bee Tongues Drive Nectar Microbial Dispersal

We investigated how bee tongues disperse nectar inhabiting yeast and bacteria, testing for differences in dispersal efficiency. Dispersal varied both among strains and within genera, suggesting microbial traits influence transfer dynamics.

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Floral nectar hosts diverse microbial communities that significantly impact plant reproduction by altering nectar chemistry and pollinator preferences. Pollinators facilitate microbial dispersal between flowers through direct contact with nectar, creating opportunities for cross inoculation. To investigate how bees

function as microbial vectors, we tested dispersal efficiency across 24 microbial strains (8 bacteria, 16 yeasts). We excised bee tongues from foraging honeybees, dipped them into standardized microbial suspensions, then immediately dipped them into sterile artificial nectar to quantify microbial transfer. We counted colony-forming units (CFUs) deposited in the nectar through plating to determine efficiency for each strain. Our results showed significant variation in dispersal efficiency both among strains and within genera, indicating that microbial dispersal depends on taxon-specific traits rather than taxonomic grouping. This variation likely influences which microbes successfully establish and persist in nectar communities, providing a mechanistic link between microbial traits and patterns of community assembly in nectar microbiomes.

U19: Target Marketing

The Impact of AI and Social Media on Target Marketing

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With the increased impact of AI and social media, machine learning models can identify and segment audience in real time and platforms can deliver hyper-personalized ads. This research will study the impact of tracking user behavior to deliver follow-up ads and its influence on target marketing.

U20: Synthesis and Dental Application of Carbon Dots

Synthesis and Dental Application of Carbon Dot Nanoparticles

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Dental biofilms, particularly those formed by *Staphylococcus epidermis*, are a major contributor to plaque accumulation and oral disease. This study investigates the potential use of carbon dots (CD) coatings as an antibacterial treatment to inhibit biofilm formation on extracted human teeth. Carbon dots are carbon based nanoparticles which indicate they are less than ten nanometers in size. Despite the small nature of this particle, they are infamous for their surface area which surrounds bacteria in close proximity, suffocating it. In this research, CDs were synthesized from natural precursors, specifically broccoli and blackberry measured at 2 lbs each. The carbon dots were synthesized by hydrothermal technique.

U21: Conch grazing impacts seagrass root microbes

*Effects of Fighting Conch (*Strombus alatus*) Grazing on Rhizosphere Microbiome of Shoal Grass (*Halodule wrightii*)*

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The rhizosphere microbiome of shoal grass, *Halodule wrightii*, plays a pivotal role in nutrient cycling, sediment stabilization, and plant resilience. While plant-microbe interactions are well studied, the influence of benthic grazers such as the fighting conch, *Strombus alatus*, on microbial community

dynamics remains poorly understood. To establish a baseline for future long-term studies, rhizosphere samples were collected immediately before conch introduction and again after 24 hours of grazing. Microbial communities were analyzed using 16S rRNA sequencing. We expect alpha diversity to remain largely unchanged, where early differences in beta diversity may suggest subtle shifts in microbial composition resulting from conch activity. These preliminary findings enhance our understanding of grazer–microbe interactions in seagrass ecosystems and may support the development of restoration strategies that incorporate rhizosphere microbiome resilience as a key component of habitat recovery.

U22: Student Perceptions on U.S. Disaster Relief

This study used a qualitative, multimethod approach to analyze the opinions and knowledge of university students on disaster relief programs, planning, and funding in the United States.

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This study used a qualitative, multimethod approach to gain an understanding of the perceptions, opinions, and overall knowledge of university students regarding disaster relief programs, planning, and funding in the United States. I aimed to interpret their knowledge of FEMA and government disaster relief programming. Using two focus groups, five interviews, and a photovoice presentation and discussion, I gathered data on student experiences and thoughts on planning, relief, recovery, and funding at a state and federal level. Additionally, I asked participants about their personal experiences with natural disasters to better understand their impacts. My data showed substantial variety in beliefs regarding disaster relief; however, a recurring opinion was the need for education on disasters and better preparation. Also, many interviewees had limited knowledge on the topic, which further highlighted the need for better education on disaster relief, which could lessen a disaster's negative impacts.

U23: Pathology and Therapeutic Strategies for Alzheimer's Disease

A study to analyze excitotoxicity and test neuroprotective strategies relevant to Alzheimer's disease (AD) utilizing differentiated SH-SY5Y cholinergic neuronal cell model.

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Alzheimer's disease (AD) is a neurodegenerative and multifactorial disorder. To analyze novel therapeutics for AD, we have optimized and characterized the differentiated cholinergic neuronal cell line SHSY5Y by the expression of morphological and chemical markers. We use this model to assess excitotoxicity as well as neuroprotection. The neuroprotectants are 1). taurine which prevents calcium overload and apoptosis in several models of neurological disease and 2). a disulfiram metabolite – Carbamathione, which prevents excitotoxicity through its action as a partial NMDA glutamate receptor antagonist. Therapeutics will be analyzed against exposure to two toxicities. The over expression of glutamate which results in excitotoxicity potentially leading to cell death, and toxic protein amyloid-beta. Our recent studies of human brain imaging point to a role for the glymphatic system in the failure to clear beta amyloid from the CNS in Alzheimer's disease (AD). In brain sections previously obtained from mouse Alzheimer's disease line (3 x Tg-AD) we will quantify expression by confocal microscopy of two markers:

namely vascular endothelial growth factor receptor -3 (VEGFR-3) and lymphatic vessel endothelial hyaluronan receptor-1 (LYVE-1).

U24: Behavioral Analysis Heat Stress Bachman's Sparrows

Effects of Beak Size and Temperature on Territorial Behavior in Bachman's Sparrows

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Increasing global temperatures and more frequent heat waves are causing thermoregulatory stress in wild songbirds, leading to behavioral changes. Birds' highly vascularized beaks and legs serve as thermal windows, enabling temperature regulation through heat radiation. Larger beaks and legs facilitate greater blood flow to these areas, improving thermoregulation efficiency. Previous research has shown that Bachman's sparrows with larger beaks sang and flew more frequently during territorial intrusions, sustaining these behaviors for longer durations. This study tests the hypotheses that bill size influences behavior primarily under heat stress. This research aims to enhance our understanding of how rising temperatures may negatively affect songbird social behavior, potentially reducing their fitness in the wild.

U25: How can AI improve business

How can AI improve business

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With the increased use of AI, business can improve operational efficiency with smarter decision-making, enhanced customer experience, innovation and product development, and security and compliance.

U26: The Health benefits of Ginger/Gingerol

Exploring the Therapeutic and Health Benefits of Gingerol: The Active Compound in Ginger

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Our poster presentation focuses on the chemistry of gingerol, the main active compound found in ginger, which is known for its various health benefits. This project explores how gingerol affects the body in positive ways and highlights its strong anti-inflammatory and antioxidant properties. Research shows that gingerol can help reduce pain, fight infections, and protect cells from damage. By sharing this project with students on campus, our goal is to make chemistry more relatable through a real-life example and to show how natural compounds can have powerful effects on health. We hope to inform and persuade students to consider natural remedies, like ginger, as part of a healthier lifestyle.

U27: Heat reshapes students' lives and routines

Too Hot to Function: How Students Adapt and Cope in Extreme Heat

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Extreme heat has become a defining feature of life in South Florida, by not only shaping the physical environment but also the everyday routine of students. This paper explores how heat changes students' daily behaviors, emotional states, and their perceptions of safety. Using two focus groups, two qualitative interviews with students, and photovoice submissions, I examined how participants navigated their daily lives during periods of intense summer heat. Findings revealed four major themes as disrupted daily routines, adaptative coping strategies, uneven institutional support, and significant emotional and physical strain. Drawing on Smith and Belgrave's analysis of disrupted normalcy and routines after Hurricane Andrew and Klinenberg's discussion of social neglect during the Chicago heat wave, this study argues that heat should be understood as a social disruption rather than a simple weather event.

U28: Detecting Superbugs: AI vs. Traditional Methods

AI in Medicine: Comparing Artificial Intelligence to Traditional Methods for Detecting Antibiotic Resistance

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Artificial Intelligence (AI) is rapidly transforming the world through life-changing innovations and its ability to acquire knowledge that humans often overlook. AI significantly contributes to the medical industry, where it has enhanced data-driven analyses and opened doors to new scientific discoveries. This project aims to compare AI-based approaches to traditional methods of identifying antibiotic resistance. It focuses on the differences in efficacy, reliability, accuracy, and overall quality of both AI and traditional detection techniques. Additionally, this research delves into how well AI detects superbugs in patients with various conditions, such as diabetes. Based on previous studies, we expect a dual approach to be most appropriate, whereas medical professions incorporate modern technologies such as AI without fully relinquishing human detection. This study emphasizes the growing role of AI in healthcare and how it has revolutionized the way professionals detect antibiotic resistance compared to previously established analytical methods.

U29: Marketing through social media

How social media affect marketing

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Social commerce plays an important role of marketing. The research will focus on to target the audience, choose the right platform, create engaging content, build relationship, and use analytics and insights through social media for marketing.

U30: Statistical Inference for Stochastic Climate Models

Developing Statistical Methods for Parameter Estimation in Stochastic Differential Equations with Continuous and Jump Dynamics

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This study develops new techniques for parameter estimation in stochastic differential equations with both continuous and jump-driven dynamics. The proposed framework is applied to a stochastic climate model that characterizes abrupt changes in global temperature. The model describes the dynamics of calcium ion concentration using a system of equations driven by Gaussian and heavy-tailed noise. Because part of the system is unobserved, the hidden component is reconstructed using previously collected calcium concentration data from central Greenland ice cores. The reconstructed process is then used to estimate continuous parameters through moment-based methods, while regression, M-estimation, and integrated squared error techniques are applied to identify the jump dynamics. These methods are validated using simulated data.

U31: Boosting wound care with natural nanoparticles

A Low-Cost Biomaterial Solution: Lemon- and Mushroom-Derived Carbon Dots for Infection Prevention

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Carbon dots, or carbon nanoparticles, are tiny particles made mostly of carbon, under 10 nanometers. We synthesized carbon dots with lemons and mushrooms in our experiment by grinding them down and doing microwave treatment to disrupt cellulose. We put the water mixture through a filter to get a solution of the carbon dots. We used lemons and mushrooms because they are already antibacterial in nature, which might be transferred over to the nanoparticles.

We tested whether such carbon dots would enhance the antibacterial activity of hydrogel, a frequent wound-healing agent that makes wounds humid but does not naturally kill bacteria. Our prediction is that hydrogels with lemon- or mushroom-based carbon dots will be more effective at inhibiting bacterial growth than hydrogel alone.

This research potentially holds far-reaching implications for global health, as a low-cost, sustainable way to enhance wound care has been identified—especially for areas lacking antibiotics and sterile equipment.

U32: Emotional growth shaping infant self-regulation

Developmental Changes in Infant Temperamental Emotionality Between 6 and 18 Months

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This study examined how infant emotions develop between 6 and 18 months through temperament. Specifically, it assessed changes in positive affectivity (smiling and laughter), negative affectivity (sadness), and regulatory capacity (soothability). Fifty-two infants participated in a longitudinal study, with mothers completing the 191-item Infant Behavior Questionnaire-Revised (IBQ-R). We predicted that 6-month smiling and laughter would positively predict 18-month soothability, while sadness would predict lower

soothability. Correlational and regression analyses showed that neither positive nor negative affectivity at 6 months significantly predicted soothability at 18 months ($p > .05$). However, smiling and laughter at 18 months significantly predicted soothability ($\beta = .34$, $R^2 = .2$), suggesting positive affect plays a stronger role in regulation. Future research should explore how emotional qualities and regulation co-develop using observational and physiological methods alongside maternal reports.

U33: Binding Study on Oncogenes

UV Vis Spectroscopic Study of Porphyrin Binding to G-quadruplexes

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This study aims to evaluate the binding interaction between porphyrins and DNA to determine how efficient porphyrin is at stabilizing G quadruplexes. This was done by performing titration experiments using DNA such as HT, c-KIT, and VEGF and titrating it into porphyrin such as TMPyP4, TMAP, and berberine chloride. Prior to the experiment, the DNA sample was annealed and scanned using a Circular Dichroism (CD) machine to make sure it is properly folded. After each titration, a scan was performed using a UV-Vis spectrometer, and the absorbance was recorded. This data was then analyzed using Origin, and the dissociation constant was calculated. The impact of this research could lead to the development of anticancer drugs as formation and stabilization of G-quadruplexes can inhibit oncogenes by limiting their interactions with enzymes.

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