Welcome to Tower Day 2026!

April 24

Join us for a day of academic dialogue and celebration at Columbus State University. Tower Day is an annual celebration of CSU research and creative endeavors generated by undergraduates, graduates and faculty. CSU students and faculty from different disciplines will present their research and creative endeavors in the form of fifteen-minute oral presentations, poster presentations.

This program is designed as an initiative to give CSU students an opportunity to share their research outside of the classroom. Our event has a keynote presentation by Earth & Space Research Scientist, professional development workshops, poster presentations, oral presentations, and mentor-led talks.

Program At-A-Glance

8:45am-9:20am	Welcome - Tower Day Conference Opening Lite breakfast provided (Blanchard A)

FRIDAY MORNING SESSIONS

9:30am-11:00am	Poster Presentations A series of brief talks in a poster presentation about research and scholarly endeavors of faculty, graduate and undergraduate students Blanchard A
9:30am-11:30am	Oral Presentations- Session I "Beyond Boundaries: Mentors-Student Partnerships in Solving Real-World Challenges" - A series of brief talks about research and scholarly endeavors of undergraduate students Room 209/210
9:30am-11:30am	Fine and Visual Arts- Session 1 Art demonstrations Room 214 Women in STEM at Brookstone HS Room 214
9:30am-11:30am	Oral Presentations- Session II "Unleashing Curiosity: Mentor-Student Collaboration in Cutting-Edge Research" - A series of brief talks about research and scholarly endeavors of undergraduate students Room 215/216

9:30am-11:30am

Graduate and Faculty Presentations- Session I

"Beyond Boundaries: Mentors-Student Partnerships in Solving Real-World Challenges" - A series of brief talks about research and scholarly endeavors of graduate students and faculty
Room 310/311

9:30am-11:15am

Professional Development Session I

"Success Post Undergraduate: Fellowship and Professional Development"

"Exploring Careers in Higher Education Administration"
Room 312/313

KEYNOTE LUNCHEON

11:30am-11:50am

Lunch

12:00pm-1:00pm

Keynote Session - "*The Long Wavelength: From Undergraduate Research to Sounding the Martian Interior*"
Cunningham Hall's Main Stage
Dr. Matthew R. Perry
Author

FRIDAY AFTERNOON SESSIONS

1:00pm-3:00pm

Oral Presentations- Session III

Cultivating Scholars: Student Research Excellence - A series of brief talks about research and scholarly endeavors of undergraduate students
Room 209/210

1:00pm-3:00pm

Mentor Led Session I

"Cultivating Scholars: Student Research Excellence and Career Relevancy"
Room 215/216

1:00pm-3:00pm	Graduate and Faculty Presentations- Session II "Cultivating Scholars: Graduate Research - A series of brief talks about research and scholarly endeavors of graduate students and faculty Room 310/311

General Notes

10:00am-11:15am	Judges' Lounge Room 211
1:00pm-2:50pm	Judges' Lounge Room 211

Detailed Schedule

Poster Presentations

TIME: 9:00-11:00 am – Blanchard A

UP-1 Logan Niemi
Developing a Bioelectrical Signal Monitoring Device [Abstract]
Mentor(s): Michael Dentzau
Major: Robotics

UP-2 Christina Wise, Destiny Palominos, Julia Wise
Investigating the Presence and Concentration of Endocrine-Disrupting Chemicals (EDCs) Found in Various Brands of Newborn Diapers [Abstract]
Mentor(s): Elizabeth Klar, Kerri Shelton Taylor
Major: Biology, Chemistry

UP-3 Jacob Steenborg, Autumn Markland
Building Bonds: How Toy Interlocking Blocks and Organic Chemistry Are More Alike Than You Think [Abstract]
Mentor(s): Kerri Shelton Taylor
Major: Chemistry

UP-4 Samuel Thrower, Garret Stephenson, Jane Parker, Alyssa Schmitz
Preserving Latent Prints for Forensic Use Through Debris Testing: Collaborative Project with Georgia Bureau of Investigation [Abstract]
Mentor(s): Kerri Shelton Taylor
Major: Chemistry

UP-5 Blessing Dike, Alisha Kennedy
Selective Therapeutic Potential of Novel Azolium-Based Triazole Salts in Non-Small Cell Lung Cancer [Abstract]
Mentor(s): Monica Frazier, Kerri Shelton Taylor
Major: Biology, Chemistry

UP-6 Jordan Mills
Coca-Cola Space Science Center Economic Impact Study [Abstract]
Mentor(s): Fady Mansour
Major: Marketing, Finance Management

UP-7 James Penwarden
Slut vs. Stud: Society's View on Sex [Abstract]
Mentor(s): Rebecca Toland
Major: Health Science

UP-8 Tatiana Roberst, April Evans
Impact of Socioeconomic Status on Family Health [Abstract]
Mentor(s): Rebecca Toland
Major: Health Science

UP-9 Eliana Scott
The Educational Impacts of COVID-19 in the United States: How Online Instruction Affected a Generation of Students [Abstract]
Mentor(s): Brennan Gonzalez
Major: Sociology

UP-10 Jakayla Lewis
Improving Student Workflows with an AI-Powered Feedback Assistant [Abstract]
Mentor(s): Rania Hodhod
Major: Computer Science

UP-11 Angela Allen
Clinical Features and Health Disparities of Herpes Simplex Virus in Pediatric Hispanic Populations: A Research Synthesis [Abstract]
Mentor(s): Rebecca Toland
Major: Health Science

UP-12 Michaela Hunt Dumlao, Caitlin Adorno
The Rh-Factor in Pregnancy in Low-Income Nations [Abstract]
Mentor(s): Rebecca Toland
Major: Health Science

UP-13 Jocelyn Fowler, Brissedia Melchor Tinoco, Farrah Johnson
Chem-sex and the effects of the uprises cases have on the youth [Abstract]
Mentor(s): Rebcca Toland
Major: Health Science

UP-14 Alecia Major
The positive and negative effects of teen pregnancy [Abstract]

Mentor(s): Rebecca Toland
Major: Health Science

UP-15 Makenzie Thomas, Gift Ubani
Women's Sexual Health in the Postpartum Period in Low-and Middle-Income Countries [Abstract]
Mentor(s): Rebecca Toland
Major: Health Science

UP-16 Sheniqua Carter-Beharry, Zacaria Jackson
Postpartum Depression and Its Impact on Maternal Mental Health and Family Dynamics: A Narrative Review of Current Research [Abstract]
Mentor(s): Rebecca Toland
Major: Health Science

UP-17 Lily Conner, P. Lawson Killough, Junebug Rahim, Maria Markosov
Stopping Brain Cancer at Its Root: Preventing Tumors from Coming Back [Abstract]
Mentor(s): Subhas Mukherjee
Major: Biology

UP-18 Jaeyoung Sim, Robert Linsley, Elijah Hawkins
Rising Rates of Sexually Transmitted Infections Among the Geriatric Population (Ages 60+) [Abstract]
Mentor(s): Rebecca Toland
Major: Health Science

UP-19 Caitlin Adorno, Caroline Batista Fermin
The Effects of Alcoholism on Family Dynamics Across America and Latin Countries [Abstract]
Mentor(s): Rebecca Toland
Major: Health Science

UP-20 Rosalee Kreischer, Yasmin Harris
The Acute Effects of Passive Stretch Duration on Active Shoulder Flexion and Extension Range of Motion [Abstract]
Mentor(s): Erica Taylor
Major: Kinesiology

UP-21 Oscar Lopez-Bolanos, Patrick Cassibry

Design and Security Hardening of a Hybrid Private Cloud Architecture for Small Business Environments [Abstract]
Mentor(s): Donnie Wendt
Major: Cybersecurity

UP-22 Rico Mora
The Transformation of the Roman-Christian Apocalyptic Tradition Through Pseudo-Methodius [Abstract]
Mentor(s): Laura Davis
Major: History

UP-23 Riley Seguin , Jill Walton, Valeria Saer
Low libido In women who suffer from endometriosis and PCOS [Abstract]
Mentor(s): Rebecca Toland
Major: Health Science

UP-24 Kailey Beasley, Novi Sandhu, Mary Ann Welter-O'connor, Jeremy Newton
The Role of Academic Anxiety in the Relationship Between Stress and Academic Performance. [Abstract]
Mentor(s): Jeremy Newton
Major: Psychology

UP-24 Jackson Boatner
"Epigenetics: How the Environment Influences Gene Expression" [Abstract]
Mentor: Rebecca Toland
Major: Health Science

UP-25 Desteny Lyons, Amaya Wilder, Halia Panoke
Bonus Parents or Bonus Problems [Abstract]
Mentor(s): Rebecca Toland
Major: Health Science

UP-26 Tennyson Smith, Zameria Butler,Kimberly Nguyen, Zahria Gaddis
The Effects of Narcissistic Parenting on Childhood and Generational Trauma [Abstract]
Mentor(s): Rebecca Toland
Major: Music, Health Science

UP-27 Zoya Babb, Sophia Williams
The Effects of Sleep Position and Quality on Shoulder Range of Motion, Mood, and

Comfort Following Acute Stretching [Abstract]
Mentor(s): Erica Taylor
Major: Kinesiology

UP-28 Tiffany Golden, Devon Cushing
Titration of Aqueous Sodium Thiosulfate with Electrolytically Generated Iodine in a Cell Powered by a Photovoltaic Panel [Abstract]
Mentor(s): Samuel Abegaz, Rajeev Dabke
Major: Chemistry

UP-29 Ashley Epps, Jarvis Evans
The impact of Physical Activity on Mental Health & Academic Performances (College Students Only) [Abstract]
Mentor(s): Erica Taylor
Major: Kinesiology

UP-30 Breanna McWhorter
Effect of Static Stretching Duration of the Shoulder Joint on Isometric Force Production [Abstract]
Mentor(s): Erica Taylor
Major: Kinesiology

UP-31 Rosalee Kreischer, Yasmin Harris
The Acute Effects of Passive Stretch Duration on Active Shoulder Flexion and Extension Range of Motion [Abstract]
Mentor(s): Erica Taylor
Major: Kinesiology

UP-32 Chance Hall, Tucker Starling
The Effects of Transcutaneous Electrical Nerve Stimulation (TENS) on Knee Flexion Range of Motion and Perceived Effectiveness [Abstract]
Mentor(s): Erica Taylor
Major: Kinesiology

UP-33 Navjot (Novi) Sandhu, Kailey Beasley, Mary Ann Welter-O'Conner
Perceived Stress and Everyday Cognitive Failures in Undergraduate Students: The Role of Sleep Quality [Abstract]
Mentor(s): Jeremy Newton

Major: Psychology

UP-34 Mary Ann Welter-O'Connor, Kailey Beasley, Novi Sandhu, Mariah Stepney
Cognitive Impairment vs. Enhancement: A Study Between Perceived Stress Levels and Subjective Working Memory Efficacy. [Abstract]
Mentor(s): Jeremy Newton
Major: Psychology

UP-35 London Von Every
Derivatization of Perfluorooctanesulfonic Acid by Isobutyl Chloroformate for Extraction and Analysis by GC-MS [Abstract]
Mentor(s): D.W. Holley
Major: Chemistry

UP-36 Madeleine Corrao, Liam Aycock, Camille Benjamin, José Delgado, John Hood, Micheal Johnson
Research Initiation Award: A NASA Award to Engage in Research of Active Galactic Nuclei and Near Earth Objects [Abstract]
Mentor(s): Rosa Williams
Major: Earth and Space Science

UP-37 Elijah Walker
Isolation of Volatile Compounds in Artemisia absinthium Stems for Bioactivity Testing [Abstract]
Mentor(s): D.W. Holley
Major: Chemistry

UP-38 Jenifer Castillo
Intelligent Heart Rate Measurement Solution for Elderly People in Rural Regions and Developing Countries [Abstract]
Mentor(s): Qi Zou
Major: Robotics Engineering

UP-39 Aleksandr Ball, Sutton Boone, JB Mcghee, Sanaa Mitchell
Examining Older Patients' Trust in Artificial Intelligence for Health Care Information [Abstract]
Mentor(s): Kisun Kim
Major: N/A

UP-40 Anderson Knap, William Smith
Then and Now, The Changing Space of Columbus [Abstract]
Mentor(s): Eric Spears
Major: History

UP-41 Ashlee Thomas
Understanding Female Orgasm Difficulties [Abstract]
Mentor(s): Rebecca Toland
Major: Health Science

UP-42 Hannah London-Janicki, Abi Roberson, Lily Southwick, Kiersten Strother
Technology Anxiety, Trust, and Avoidance of AI-Enabled Technologies Among Older Adults [Abstract]
Mentor(s): Kisun Kim
Major: Communication

UP-43 Reese Henry
The Challenges of Prediabetic Pediatric Intervention [Abstract]
Mentor(s): Rebecca Toland
Major: N/A

UP-44 Adrianna Harris, Felicia Starkes, Patrice Porter, Reginald Copeland Jr.
Digital Ageism Internalization and Digital Exclusion Anxiety Among Older Adults [Abstract]
Mentor(s): Kisun Kim
Major: Communication Integrated Media, Communication Film Production

UP-45 Skylar Kingsley, Victoria Hardy
Computational Development of Novel Azole Compounds for the Treatment of ALS [Abstract]
Mentor(s): Kerri Shelton Taylor
Major: Chemistry

UP-46 Caringtyn Fouts
Menopause and its Effects on Livelihood in Women [Abstract]
Mentor(s): Rebecca Toland
Major: Health Science

UP 47 Donovan Stone, Blake Dugan

The Effects of Transcutaneous Electrical Nerve Stimulation (TENS) on Quadriceps Muscle Pain Compared to Heat Therapy in Young Adults [Abstract]
Mentor(s):
Major: Kinesiology

FGP-1 Kisun Kim, Youngrak Park
Experience-Based Evaluation of Generative AI: How Output Performance and Service Fit Shape Expectancy Beliefs and Continued Use Intention [Abstract]
Area: Communication

FGP-2 Loriane Favoretto Hill, Ellen Martin
When Sports Are Built to Include: Adapting Tennis for Individuals with Autism Spectrum Disorder [Abstract]
Area: Health and Physical Education

FGP-3 Kayla Nickerson, Nama Mandiga, Luna Fuentes
Reframing Reality: How Cognitive Behavioral Therapy Disrupts the Cycle of Body Dysmorphic Disorder [Abstract]
Mentor: Dr. Hillary Ellerman
Area: Clinical Mental Health Counseling

FGP-4 Mary Claire Streat
Assessing Culvert Impacts on Water Quality in West Georgia Streams [Abstract]
Area: Earth and Space Sciences
Mentor: Troy Keller

FGP-5 George Darrisaw III, Kayla Nickerson, Petrina Moore
The Impact of Counselor Wellness on Burnout and the Therapeutic Alliance [Abstract]
Mentor: Dr. Lauren Neal
Area: Clinical Mental Health Counseling

FGP-6 James Wiggins, Troi Hudson, Liam Aycock
Carbon Mineralization in a Laboratory Setting: Lessons Learned From Experimental Design [Abstract]
Mentor: Clint Barineau
Area: Geology, Astrophysics

FGP-7 Daija Gibson
Reframing Sexual Assault and Intimate Partner Violence Through a Maternal and Child

Health Lens: Implications for Prevention, Policy, and Practice [Abstract]
Mentor: Patricia Anafi
Area: Public Health

FGP-8 Abigail Murphy
Identity and presentation effectiveness for job seekers through the use of LinkedIn [Abstract]
Mentor: Ramesh Rao
Area: Communications

FGP-9 Reese Wimberly
Lift Every Voice: How Media and Generational Communication from Self-Expression for Black Adults Between the Ages of 18-29 [Abstract]
Mentor: Kisun Kim
Area: Communications

FGP-10 Ayomiposi Akinyemi, Joseph Belle, Ariel Oden, Sophia Rother, Alexis Sutcliff
Anticipated Effects on Deep Groundwater Flow by Proposed Quarry [Abstract]
Mentor: Stephen Jessup
Area: Environmental Science

Student Oral Session I

"Beyond Boundaries: Mentors-Student Partnerships in Solving Real-World Challenges"
Time: 9:00 AM- 11:15 AM – Room: 209/210
Session Chair:

OS1-1 9:00-9:15 Nikhil Saddi
SignalWeave [Abstract]
Mentor(s): Rania Hodhod
Major: Cybersecurity, Engineerging

OS1-2 9:15-9:30 Evan Ahmed, Adam McDonald, Noureldeen Younis
Pop-Up Java: Exploring the Effectiveness of Augmented Reality in Coding Education [Abstract]
Mentor(s):
Major: Computer Science, Computer Engineering

OS1-3 9:30-9:45 Evan Bradshaw, Yosel Rivera, Jeshlymar Vicente Maldonado, Wyatt Bridges, Isabel Ehrlich
Tree Disease Detection AI [Abstract]
Mentor(s):
Major: Computer Science, Computer Engineering

OS1-4 9:45-10:00 Brennan Widner, Landon Alexander, Dajour Johnson
AI RAG Protocol Security [Abstract]
Mentor(s): Kerri Taylor
Major: Games Programming, Software Systems

OS1-5 10:00-10:15 Alexander Wilson, Jacob Tate
Sale Predictor [Abstract]
Mentor(s): Lydia Ray
Major: Computer Science Games Programming, Software Systems

OS1-6 10:15-10:30 Christopher Holley, Ryan Willis, Nathan Brown, Tristin Davis
Finch Robotic Programming [Abstract]
Mentor(s):

Major: Computer Science Games Programming, Software Systems, Cybersecurity

OS1-7 10:30-10:45 Janeen Reid, Alessandra Williams, Beth Owenby, KC Reyes
How Age-Based Stereotypes Affect Senior Citizens to Learn AI Technology [Abstract]
Mentor(s):
Major: Communication

OS1-8 10:45-11:00 Dwyana Williams
Defying the Odds [Abstract]
Mentor(s):
Major: Communication

OS1-9 11:00-11:15 Aajay Thiruppathi
The Effect of Novel Heterocyclic Compounds on the Growth of Triple Negative Breast Cancer Cells [Abstract]
Mentor(s): Ramneet Kaur
Major: Biology

Student Oral Session II

"Unleashing Curiosity: Mentor-Student Collaboration in Cutting-Edge Research"
Time: 9:00 AM- 11:15 AM – Room: 215/216
Session Chair:

OS2-1 9:00-9:15 Hannah Simmons
The Effect of Natural Products on the Growth of Docetaxel Resistant Triple Negative Breast Cancer Cells [Abstract]
Mentor(s): Ramneet Kaur
Major: Biology

OS2-2 9:15-9:30 Aaliyah Moise
Familial violence and its effects on family structure [Abstract]
Mentor(s):
Major: Health Science

OS2-3 9:30-9:45 Myriam Thiam
Targeted Intervention Strategies for Androgen Independent Prostate Cancer (AIPC): A Natural Product Approach [Abstract]
Mentor(s): Ramneet Kaur
Major: Biology

OS2-4 9:45-10:00 Emily Crews, Mackenzie Phipps
The Effects of Secondary Metabolites Extracted from Eupatorium serotinum on the Growth of Androgen-Independent Prostate Cancer Cells [Abstract]
Mentor(s): Ramneet Kaur
Major: Biology

OS2-5 10:00 -10:15 Venkat Garlapaty
The Effect of Natural Products on The Growth of Docetaxel-Resistant Androgen Independent Prostate Cancer Cells Expressing Cancer Stem Cell Markers [Abstract]

Mentor(s): Ramneet Kaur
Major: Biology

OS2-6 10:15 -10:30 Trinity Washington
Developing an Eco-Friendly Rust Remover: Testing Citric-Citrate Solutions with Natural Inhibitors [Abstract]
Mentor(s): W.D. Holley
Major: Chemistry

OS2-7 10:30 -10:45 Nevaeh Norwood, Tamia Mcghee, Ashlee Thomas
The Long-Term Impact of Child Abuse on Development and Mental Health [Abstract]
Mentor(s):
Major: Health Science

OS2-8 10:45 -11:00 Elijah Starkey, Feshuna Calloway, Grace McMillen, Natalee Clawson, Ayden Knighton, Sanaa Mitchell, Jamie Neal, Matthew Petallar, Amy Taylor, Robert Gill
The JT48 Project – Columbus College in the Civil Rights Era [Abstract]
Mentor(s): Andrea Frazier
Major: Interdisciplinary Studies

Fine and Visual Arts

TIME: 9:30-11:30 am – Room 214
Session Chair:

ART1-1 9:30am- 9:50am
Michelle Laverne Bossier
The Elephant in My Living Room [Abstract]
Mentor(s): NA
Major: Criminal Justice

Brookstone High School Session I

"Women in STEM at Brookstone HS"
Time: 10:00 AM- 10:45 AM – Room: 214

Presentations are arranged in 6 different projects with teams of two.

Elise Ferdinands
Brennan Neal
Mary Carter Fort
Cameron Valadi
Max Lopez
Addison Guin
Penelope Mayfield
Jiya Patel
Rayna Gor
Sydney Zwickey
Thomas Caves

Graduate/Faculty Session I

"Beyond Boundaries: Mentors-Student Partnerships in Solving Real-World Challenges"
Time: 9:30 AM- 11:15 AM – Room 310/311
Moderator: Yesem Kurt Peker

GFO 1-1 9:30-9:45 Jennifer Lovelace
Beyond calling: What keeps us going when the going gets tough [Abstract]

GFO 1-2 9:45-10:00 Lee McVadon
Using neurofeedback as a treatment modality for post-traumatic stress disorder [Abstract]
Mentor: Hillary Ellerman
Progam: MS Clinical Mental Health Counseling

GFO 1-3 10:00-10:15 Rahmatullah Roche
ProRNA3D-single: A Deep-Learning Powered Protein-RNA 3D Structure Prediction Method [Abstract]

GFO 1-4 10:15-10:30 Rahul Raj
Zero Trust for Non-Terrestrial Systems [Abstract]
Mentor: Yesem Kurt Peker
Program: MS Cybersecurity

GFO 1-5 10:30-10:45 Eric Spears
Spatial Practices of Power: (Re)Producing São Paulo Across Regime [Abstract]

GFO 1-6 10:45-11:00 Alejandro Villasana
The Generous Inquiry Protocol: Neutralizing the "It's Not For Me" Syndrome in Secondary STEM Education [Abstract]
Mentor: Basil Conway
Program: EdD Curriculum and Instruction

Professional Development Session I

"Success Post Undergraduate: Fellowship and Professional Development" [Abstract]

Time: 9:30 AM- 11:15 AM – Room: 312/313

Moderator: Michelle Jones

PD1-1 9:30-10:00am Joshua May, National Scholarship Committee
Undergraduate/Graduate Fellowship and Scholarship

"Exploring Careers in Higher Education Administration" [Abstract]
Time: 10:45 AM- 11:15 AM – Room: 312/313

PD1-2 10:45-11:15am Jennifer Lovelace, Director of the Doctoral Program
Melissa Young, Assistant Vice President for Student Success
Michael Poll, Adjunct Instructor, Higher Ed. Admin.

Keynote Luncheon

Theme: "*The Long Wavelength: From Undergraduate Research to Sounding the Martian Interior"*

12:00pm-12:55pm Dr. Matthew Perry, Research Scientist

Speaker Biography

Matthew R. Perry is a Research Scientist at the Planetary Science Institute. His research involves the interpretation of subsurface radar sounding data specifically as it pertains to the presence of

sits. He is also involved in numerous NASA-funded research projects solution 3D radargrams from Mars Reconnaissance Orbiter (MRO) d Mars Express Mars Advanced Radar for Subsurface and Ionosphere tions. He is a Co-Investigator on MRO SHARAD and serves as the orado SHARAD Processing System, which is primarily responsible for

he SHARAD Science Team. CO-SHARPS also provides parameterized ound the world. He also serves as the System Manager for ation.

Citation: Matthew Perry

Mentor-Led Session I

"Connected Futures: Exploring the Power of IT"

Time: 1:00 PM- 2:30 PM – Room 209/210
Moderator: Lydia Ray

ABSTRACT
This mentor-led session highlights the innovative work of students in **CPSC 3555: Human-Centered IoT Design and Engineering**, where technology is developed not just to function—but to serve real human needs. Four student teams will present fully functional IoT prototypes that address everyday challenges through intelligent, low-cost, and user-centered design. During this session, students will demonstrate working prototypes, explain their engineering decisions, and showcase real-world applications of their designs. Attendees will experience how human-centered IoT solutions can transform everyday environments into responsive, intelligent systems—while remaining affordable, practical, and scalable.

ML 1- 1 Smart Coffee Maker – A WiFi-enabled coffee system that can be controlled through a mobile app and autonomously begins brewing when it detects morning light, seamlessly integrating automation into daily routines.
Student: Cieplensky, Nicholas

ML 1- 2 Smart & Affordable Home Security Monitor – A low-cost, DIY security solution that uses motion detection to identify unauthorized entry and instantly notify homeowners via a WiFi-connected mobile app, demonstrating how accessible IoT can enhance personal safety.
Students: Joseph Craig, Paris Powell, Jagrishi Settipalli

ML 1- 3 Smart Plant Watering System – An intelligent irrigation system that monitors soil moisture levels in real time, determines plant hydration needs, and automatically waters when necessary—promoting sustainability and plant health with minimal human intervention.
Student: Sean Horne

ML 1- 4 Smart Mold Alert System – An environmental monitoring system that tracks temperature and humidity levels, analyzes conditions favorable to mold growth, and proactively alerts homeowners before costly damage occurs.
Students: Josh Lowery, Elijah Gamble, DJ Johnson, Kameryn Redd

Oral Student Session III

"Cultivating Scholars: Student Research Excellence"

Time: 1:00 PM- 2:30 PM – Room 209/210
Session Chair:

OS3-1 1:00-1:15 Grissel Alexa Sala
Law Enforcement and Protest [Abstract]
Mentor(s): NA
Major: Computer Science (Software)

OS3-2 1:15-1:30 Axel Jones
Why Prince Hamlet Would Hate Shakespeare (Or, A Commentary On This Generation's Approach to Classical Literature) [Abstract]
Mentor(s): Elizabeth Reeves
Major: Design Tech

OS3-3 1:30-1:45 Christin Warren
Public Sentiment and MASH in the Final Years of The Vietnam War [Abstract]
Mentor(s): NA
Major: History

OS3-4 1:45-2:00 W. Brock Smith
American Judgment on Calley's Conviction: How Southerners Related Calley's Conviction to the Vietnam War [Abstract]
Mentor(s): NA
Major: History

OS3-5 2:00-2:15 Gavin Tate
Blending the Divine: Religious Complexity in the Achaemenid Empire [Abstract]
Mentor(s):
Major: History

OS3-6 2:15-2:30 Daniel Callies
POST-Certified De-Escalation Training: Does It Affect Use of Force in Georgia Law Enforcement? [Abstract]
Mentor(s): Patrice Kerner

Major: Criminal Justice

OS3-7 2:30-2:45 Zoe Milano
Child Abuse leading to Addictions in Juveniles: The Lasting Impacts [Abstract]
Mentor(s): Patrice Kerner
Major: Communication

OS3-8 2:45-3:00 Rachel Turner
Drivers of Road Rage: A Social Phenomenon [Abstract]
Mentor(s):
Major: Sociology

Graduate/Faculty Session II

"Cultivating Scholars: Graduate and Faculty Research"
Time: 1:00 PM- 3:00 PM – Room: 310/311
Session Chair: Yesem Kurt-Peker/Michelle Jones

GFO 2-1 1:00-1:15 Mohammad Jafari
Closed-Loop Regulation of Cell Migration: Integrating Neural Network Control and Bioelectronic Stimulation [Abstract]

GFO 2-3 1:15-1:30 Subhas Mukherjee
Disrupting CDK5-Mediated MCL1 Stabilization to Sensitize Glioblastoma to Radiation [Abstract]

GFO 2-4 1:30-1:45 Kayla Winston-Bass
Short-Form Content on Attention Span in the Classroom [Abstract]
Mentor: Kisun Kim
Program: MA Communication

GFO 2-5 1:45-2:00 Nigel McEachern
The Link between Legacy media & Digital Media [Abstract]
Mentor: Kisun Kim

Abstract Index

UP-1 Logan Niemi

Developing a Bioelectrical Signal Monitoring Device

Recent research has shown that bioelectrical signals from living organisms can be represented both in graphics and audio. This project is designed to expand upon this to develop a portable, field-capable device that can monitor, collect, and display these bioelectrical signals from plants, with a focus on fungi. The final design of this device will incorporate sensors to monitor the environment such as humidity, ambient light, and temperature, along with probes to measure millivolts of the specimen. Bioelectrical signals will be collected and stored onto an Arduino micro controller, and able to be exported to a computer to be put into a graph. An additional module will be designed to run these signals through a filter and output music notes through speakers. The goal of this engineering design activity is to produce a working prototype enclosed in a 3-D printed housing. Ultimately, such a portable instrument can be used to collect data in-situ and potentially look for differences across species and across different environmental gradients.

UP-2 Christina Wise, Destiny Palominos, Julia Wise

Investigating the Presence and Concentration of Endocrine-Disrupting Chemicals (EDCs) Found in Various Brands of Newborn Diapers

Endocrine-disrupting chemicals (EDCs) are categorized by the ability to mimic, alter, or block naturally occurring hormones in the body, in turn disrupting the endocrine system. The endocrine system is a significant contributor to the maintenance of numerous processes, including the preservation of homeostasis through hormone regulation and production.

Hormones aid in metabolic function, development, mood regulation, and reproduction. Due to limited research on EDCs, the extent of the negative health implications of having EDCs within products is ongoing. This experiment aims to analyze newborn diapers from both widely known brands and those advertised as "natural". Infant exposure to EDCs has been correlated to an increased risk of childhood diseases, including multiple organ dysfunctions, childhood obesity, and issues concerning glucose-insulin homeostasis. The vulnerability of newborn babies is the focus of the experiment due to the similarities shared between diapers and menstrual products. Given that menstrual products have been found to contain numerous EDCs, and diapers share a comparable function of absorption. Using Mass Spectrometry, the presence and concentration of EDCs will be examined in samples of newborn diapers. The importance of this experiment lies in the duration for which diapers are worn as compared to menstrual products, which potentially exposes newborns to more negative effects concerning growth, metabolism, and reproduction.

UP-3 Jacob Steenborg, Autumn Markland

Building Bonds: How Toy Interlocking Blocks and Organic Chemistry Are More Alike Than

You Think

The use of interlocking toy building blocks (e.g., LEGO) as teaching modules will be used to demonstrate key reactions and select mechanisms in organic chemistry. Interlocking building blocks were assembled on a baseplate to depict chemistry concepts of functional groups, resonance, acid-base reactions and other fundamental reactions through the perspective of CARIO, which is presented with various molecules and ions. CARIO provides a framework for predicting electron flow by evaluating factors in the following order: charge, atom, resonance, induction, and orbital effects. Additional modules depict the reactivity of amines and amides via SN2 pathways. Comparisons of SN2 vs SN1 mechanisms are also illustrated. Carbocation stability is generally specific to leaving-group tendencies and are displayed to demonstrate the connection to substitution reactions. The modules will be utilized to illustrate key topics in an undergraduate chemistry course for chemistry and STEM majors. Modules are intended to be presented on a document camera for in-person and online modes of delivery. A quiz is implemented to assess the modules' effectiveness.

UP-4 Samuel Thrower, Garret Stephenson, Jane Parker, Alyssa Schmitz

Preserving Latent Prints for Forensic Use Through Debris Testing: Collaborative Project with Georgia Bureau of Investigation

Preserving latent fingerprints for forensic analysis during debris testing is a problem that has arisen in a number of cases by Georgia Bureau of Investigation's Forensics Department. The destruction of latent fingerprints in the process of debris testing is of a high interest because the collective set of evidence is not able to be split for dual analysis. The intention is to help understand how to "keep" the composition of the fingerprint so it can be studied for physical review purposes (latent print identification) and arson (heat and combustion). The goal of this research project is to determine a way for both the latent print and debris labs to test the same materials without damaging the print evidence on them. The revolves around a number of factors (temperature and contents) that impact the longevity of the fingerprints on glass withstand before deteriorating past the point of testing. We are developed a series of experiments to assist Georgia Bureau of Investigations with how to help split fingerprints for dual analysis. The intention is to help understand the chemical composition of the fingerprint so it can be studied for physical review purposes (latent print identification) and debris (heat and combustion).

UP-5 Blessing Dike, Alisha Kennedy

Selective Therapeutic Potential of Novel Azolium-Based Triazole Salts in Non-Small Cell Lung Cancer

Lung cancer is the second most common cancer in the United States and the leading cause of cancer-related death. Although lung cancer is more prevalent in older populations, a small percentage of diagnoses occur in individuals under 45 years of age. Lung cancer is divided into two subtypes: small cell (SCLC) and non-small cell (NSCLC). This project focuses on NSCLC, which represents 80–85% of cases. Current chemotherapy options, while effective, often lack specificity

and damage normal cells in addition to cancer cells. Therefore, identifying treatments that selectively target cancer cells while minimizing effects on healthy cells is critically important for improving patient outcomes. The purpose of this study is to test novel azolium-based triazole salts against NSCLC with the goal of identifying a more selective and effective therapy. We synthesized, characterized, and tested the biological activity of a series of novel azolium-based triazole salts against WI-38 (normal lung) and H1299 (lung cancer) cells. Preliminary cell viability data suggests that the triazole derivatives have selective, dose-dependent anti-proliferative effects on H1299 cells. We hypothesize that Bis(2-Naph)-1,2,3-triazole (T3 2-2) and is-3-phenylbenzyl-1,2,3-triazole (T3 5-5) selectively inhibit the growth of lung cancer cells and promote apoptosis, while minimizing effects on normal lung cells. For this research, the drugs were solubilized in either pure DMSO (T3 2-2) or a mixture of DMSO and ethanol (T3 5-5) and diluted in cell media to final concentrations of 30, 15, 5, and 1 μM. Cisplatin and the corresponding solvent controls were used as appropriate controls. Results show a dose-dependent decrease in the growth of H1299 cells with little to no effect on WI-38 cells. Viability data also indicate a selective, dose-dependent increase in cell death of H1299 cells. Future studies will employ flow cytometry to further characterize these outcomes through cell cycle analysis and mitochondrial function studies.

UP-6 Jordan Mills

Coca-Cola Space Science Center Economic Impact Study

This study evaluates the impact of the Coca-Cola Space Science Center (CCSSC) in Columbus, Georgia, through four complementary perspectives that together capture its economic, educational, and strategic significance. First, it assesses the CCSSC's monetary impact on the regional economy by estimating how its ongoing operations and expenditures support employment, labor income, and economic activity in the Columbus, Georgia–Alabama Metropolitan Statistical Area, using a conservative framework that excludes visitor-related tourism spending. Second, the study presents quantitative evidence from student and teacher surveys to examine short-term educational outcomes, including students' interest and engagement among MCSD fourth-, fifth-, and sixth-grade participants and teachers' assessments of alignment with the Georgia Standards of Excellence. Third, it draws on qualitative testimonies from educators, community leaders, and former participants to illustrate plausible educational and career pathways shaped by early exposure to hands-on space and STEM programming. Finally, the analysis situates these findings within a broader context of national security and technological competitiveness, emphasizing the importance of early STEM engagement in sustaining the long-term workforce pipeline required for U.S. leadership in aerospace, defense, and advanced technologies amid intensifying global competition.

UP-7 James Penwarden

Slut vs. Stud: Society's View on Sex

This study explores and explains the sexual double standard reflected in society where men are framed as "studs" and women are "sluts", examining how similar sexual behaviors are judged differently based on differing gender. This information is gathered from scholarly reviewed articles,

public health data, and scientific findings to analyze and understand how social norms shape the perception of reputation and social acceptance, studies show that men are more often praised and held in higher regard for having multiple sexual encounters than women. Key factors that further back this include gender role expectations, media portrayal, influence from peers, and social beliefs. This study also places an emphasis on the psychological and behavioral issues that this social norm produces, such as impacts on self esteem, relationship dynamics, and sexual communication. Although the younger generations are starting to veer off of this way of thinking, the double standard is still incredibly present. Understanding the blatant inequality between men and women is paramount to promoting a healthier understanding about sexuality.

Keywords: Sexual double standard, Gender differences, Sexual behavior, Social Norms.

UP-8 Tatiana Roberst, April Evans

Impact of Socioeconomic Status on Family Health

The socioeconomic standing of a family impacts its stability, health and quality of life. Income, education, employment, housing conditions, access to transportation and food security are important factors that have an effect on a person's physical and mental health. Families who do not have access to these resources often suffer from ongoing stress and barriers that limit their ability to function normally. A low socioeconomic status is typically linked to lower levels of food security, unstable housing, less access to healthcare, and lower financial flexibility. This can develop into a cycle that is difficult to escape. Participation in a poverty simulation provided further insight into the realities many families face. With limited financial resources, families were forced to prioritize essential needs such as food, rent, childcare, and transportation.

Reduced food assistance and the rising cost of living have made it increasingly difficult for families to provide basic necessities. Caregivers, especially mothers, often carry the responsibility of securing employment while also managing childcare and household responsibilities, frequently with limited support. Poverty is not solely defined by a lack of income. It also involves chronic stress, uncertainty, and constant decision making under pressure. These factors can significantly affect health outcomes. Individuals facing socioeconomic hardship may delay medical care, struggle to afford medications, or have difficulty following treatment plans due to competing financial demands. Understanding the impact of socioeconomic status is essential in health and human services, as it promotes more informed, equitable, and compassionate care for vulnerable populations.

UP-9 Eliana Scott

The Educational Impacts of COVID-19 in the United States: How Online Instruction Affected a Generation of Students

The COVID-19 pandemic triggered a widespread disruption of the United States education system, requiring an abrupt transition from in-person instruction to online learning across K–12 and higher

education. This paper examines how this sudden shift affected students academically and socially and considers what these impacts reveal about the broader societal role of education. The central research questions guiding this study ask how pandemic-era online instruction disrupted the manifest and latent functions of education and what long-term consequences these disruptions may pose for social stability and cohesion in the United States.

Grounded in the structural functionalist perspective, this paper contributes to sociological analyses of education by situating pandemic-related learning loss and social isolation within classical theories of social order and institutional interdependence. Drawing on the work of Emile Durkheim, Talcott Parsons, and Robert K. Merton, the paper conceptualizes education as a core social institution responsible not only for academic instruction but also for socialization, moral development, and the maintenance of social equilibrium. While existing scholarship has documented declines in standardized test performance and widening racial and socioeconomic achievement gaps since the onset of COVID-19, this paper extends that literature by explicitly linking these trends to disruptions in education's latent social functions and to broader strains placed on families, the economy, and youth development.

Methodologically, this study employs a theoretical analysis informed by secondary research on educational outcomes and youth mental health during and after pandemic-related school closures. Empirical findings from national and peer-reviewed studies are synthesized and interpreted through a structural functionalist framework to assess how the rapid reorganization of schooling affected the education system's capacity to fulfill its societal functions.

This paper concludes that the educational disruptions caused by the COVID-19 pandemic represent a significant sociological concern with implications extending beyond short-term learning loss. Declines in academic achievement and weakened social integration among youth may have lasting effects on workforce readiness, economic participation, and social cohesion as younger generations enter adulthood. Continued research is essential to evaluate the long-term impacts on societal outcomes.

UP-10 Jakayla Lewis

Improving Student Workflows with an AI-Powered Feedback Assistant

This project presents the development of a web-based AI feedback assistant designed to help students review and improve their assignments before submission. The system was implemented for a Social Media and Digital Marketing course and is uniquely tailored through direct faculty input. Assignment guidelines, evaluation criteria, and instructional expectations provided by the instructor are embedded into the system, allowing the AI to generate feedback that closely reflects course-specific standards rather than relying on generic responses. This customization improves the relevance, accuracy, and consistency of the feedback students receive.

Built using JavaScript, HTML, and CSS, the application integrates file-upload functionality, user input processing, and a clean, accessible design to support an interactive learning experience. Students can upload their work and receive targeted suggestions for clarification, correction, and improvement aligned with the instructor's objectives.

By incorporating faculty-driven parameters into the AI workflow, the project demonstrates how guided AI systems can enhance performance, support personalized learning, and maintain alignment with pedagogical goals while providing scalable academic assistance. The presentation will include a live showcase of the system to demonstrate its functionality and practical use in the classroom.

UP-11 Angela Allen

Clinical Features and Health Disparities of Herpes Simplex Virus in Pediatric Hispanic Populations: A Research Synthesis

Herpes simplex virus represents a significant pediatric health concern because its clinical course and long-term outcomes are deeply influenced by social, cultural, and structural determinants of health. In early childhood, primary infection typically manifests as herpetic gingivostomatitis. This condition is characterized by painful oral lesions, high fever, irritability, and inflamed gingiva. Beyond immediate physical discomfort, these symptoms often lead to reduced oral intake, dehydration, and missed school days, placing a substantial burden on both the child and the caregivers. Following the resolution of the acute phase, the virus establishes lifelong latency within the sensory ganglia. Periodic reactivation, often triggered by stress, ultraviolet exposure, or illness, results in herpes labialis. These recurrent cold sores can cause persistent physical discomfort and significant psychological distress or social stigma for developing children and their families.

While most pediatric cases are self-limited, neonatal infection is a rare but devastating exception. It typically presents three patterns: disease limited to the skin, eyes, and mouth; central nervous system disease; or disseminated multisystem involvement. Neonates with central nervous system involvement face high risks of seizures and permanent neurodevelopmental impairment, while disseminated disease affecting the liver, lungs, and adrenal glands carries a high mortality rate even with intervention. Consequently, early clinical recognition and immediate initiation of antiviral therapy are vital to preventing systemic failure and long-term neurological complications.

The risk of exposure and the severity of the disease are not distributed equally across populations. In the United States, Hispanic children may face higher exposure risks due to specific structural and household factors. Multigenerational living arrangements and close contact caregiving practices, while fostering strong familial support, can facilitate viral transmission, particularly through asymptomatic shedding by adult caregivers. Furthermore, socioeconomic barriers such as limited health insurance, language discordance in clinical settings, and transportation instability often delay diagnosis. These structural inequities mean that children from marginalized communities may

present with more advanced disease, leading to poorer prognostic outcomes and a higher likelihood of permanent injury.

Modern diagnosis relies heavily on polymerase chain reaction testing, which provides rapid and high sensitivity detection of viral DNA necessary to distinguish the virus from similar conditions like impetigo or hand foot and mouth disease. Acyclovir remains the gold standard for treatment. In neonatal cases, this involves intensive intravenous administration followed by long term oral suppressive therapy to protect neurological function and reduce the frequency of recurrences.

Effective prevention and management require integrated public health strategies that respect cultural nuances and community strengths. Family centered education must extend to all caregivers, including extended family members, to ensure a comprehensive understanding of transmission risks. By providing linguistically appropriate materials and addressing structural barriers to care, healthcare systems can better support Hispanic families, reducing the disparities associated with pediatric infections and improving long term health equity for all children.

Keywords
Herpes simplex virus, Pediatrics, Hispanic health, Health disparities

UP-12 Michaela Hunt Dumlao, Caitlin Adorno

The Rh-Factor in Pregnancy in Low-Income Nations

The Rhesus (Rh) factor describes the protein surrounding red blood cells. This protein differentiates between positive and negative blood types. If an individual's red blood cells contain the Rh factor, their blood type is positive. If the Rh factor is not present, the individual's blood type will be negative. Rh-incompatibility occurs when the body comes in contact with Rh-positive blood when the host is Rh-negative. This causes the body to identify the Rh-positive blood proteins as foreign, and the body will begin to attack them, causing a process called hemolysis, which is the breakdown of red blood cells. Rh-incompatibility may occur during blood transfusions, but also during pregnancy. This is not common in many first pregnancies due to the initial production of antibodies to protect both mother and fetus, which is called Rh sensitization. Rh-incompatibility affects pregnant women in subsequent pregnancies due to the antibodies preexisting in the body as the fetus develops. If the baby being carried is Rh-positive within a Rh-negative mother's womb, Rh-incompatibility will occur.

To prevent Rh-incompatibility effects, women are given Rho(D) immune globulin of Rhogam to prevent antibodies from being made. This research study will examine the Rh-factor in pregnancy in low-income nations; research will be conducted via peer-reviewed primary and secondary research sources and journals. This research will delve into the barriers to receiving treatment, such as prenatal care in low-income nations, which causes a high risk for fetal death. In low-income nations, a general lack of access to prenatal care causes high infant mortality, with Rh-

incompatibility being a contributor. Rh disease, the effect of Rh incompatibility on the fetus, has essentially been primarily "eradicated" in high-income nations such as the United States. High infant morbidity and mortality in low-income nations such as South Asia and Sub-Saharan Africa continue to be prevalent. Increasing public health and safety for women who may be affected in their pregnancies by Rh-incompatibility and having access to fetal monitoring and Rhogam would be essential to lowering infant mortality and improving fetal outcomes in the affected nations.

UP-13 Jocelyn Fowler, Brissedia Melchor Tinoco, Farrah Johnson

Chem-sex and the effects of the uprises cases have on the youth

The inclusion of Psychoactive drugs has been used to increase and/or ease sexual experience voluntarily. The term used to describe this action is known as Chem-sex. Due to its connection with drugs, substance abuse has increased in participants alongside the rates of sexually transmitted diseases such as STIs and HIV, which is the prevalent result of bed-chem, it presents itself as an unprecedented public health concern. The study seeks to understand the behavioral and social mechanisms that make individuals partaking and vulnerable to both addiction and sexual health risks within the community. The investigation will utilize mixed methods, consisting of the analyzation of multiple pieces of literature data, epidemiological data, and qualitative interviews. On going reports regarding the public health provided data on drug prevalence, sexual behavior, and infection rates, which were all analyzed to identify patterns regarding risky behavior and Chem-sex. Preliminary finding suggests that individuals that take part engaging in the activity known as Chem-sex are more likely to engage in unsafe sex, due to impaired judgement. The overall study concludes that chemsex is a large and relatively new public health concern which needs intervention strategies to prevent the increase rates of risk and potential addiction from forming.

Keywords: Chemsex, psychoactive drugs, substance abuse, sexual health risk, STIs, HIV, public health, addiction vulnerability, risk behavior, mixed methods research.

UP-14 Alecia Major

The positive and negative effects of teen pregnancy

This research will pose how teen pregnancy can influence the outcomes of life for young parents and those around them. This also includes the circumstances for positive personal growth that can occur. This is to focus on the different areas that are impacted on adolescents and their communities. Research that has already gone places spotlight on the challenges that are brought about, such as financial instability, emotional incompetence, and interrupted education. Rarely has research talked about the positives like personal responsibility, supportive communities, and mature development in certain aspects. The central question surrounding this study is: What are the short-term and long-term impacts of adolescent pregnancy, and what positive outcomes can occur despite these challenges?

Teen pregnancy is often made to be focused on to be a negative social problem. This research is to bring awareness and provide a balanced look by analyzing both the shortcomings and upbringings.

This research will have scholarly studies, demographic data, and social science research that relates to adolescent development and teen pregnancy. By comparing the outcomes across different socioeconomic and cultural contexts, adolescents can be influenced through education, healthcare, and community resources. This is not to focus on individual cases, but an overall approach with patterns and themes.

The expected findings about teen pregnancy are hoped to present significant obstacles when teens lack the needed resources. Due to limited resources and support, negative outcomes are more likely to occur. This research highly anticipates the stronger the positive outcome can stem from strong family support, access to good healthcare, and outreach programs. The conclusions discussed will emphasize the importance of supportiveness and intervention strategies to improve the outcomes for adolescent parents and their children. Within broader context of education reform and prevention programs this project aims to move beyond the one-dimensional narrative. The more access adolescents have to education initiatives, the more achievable positive teen pregnancies can be.

Keywords: teen pregnancy, adolescent pregnancy, positive, negative, long-term, short-term, adolescent development

UP-15 Makenzie Thomas, Gift Ubani

Women's Sexual Health in the Postpartum Period in Low-and Middle-Income Countries The purpose of this article is to summarize and describe the current research on women's postpartum sexual health within the low- and middle-class income countries, showing the sexual function and dysfunctions to fill in gaps, trends and limitations. In October 2021, this research was done on women between the ages 15 – 49 that gave birth within a year, it mainly evaluated in Saharan Africa. There are only five articles on the positive side of sexual health, and a large proportion of the studies examined the return to sex after childbirth. The postpartum period should be looked at more and help should be more effective for women.

To collect our information, we first spoke with the science librarian to get help with finding our studies that were included surrounding the topic of postpartum sexual health and specifically articles that were published over the past 30 years (2001-2021). These studies explored women's sexual health during the postpartum period. The first thing done to set the parameters for the review was to have a definition down for sexual health, which was derived from the World Health Organizations definition and other examples. Because there are many different topics under the umbrella of sexual health in the postpartum period, the final criteria of information included was solely based on sexual function and dysfunction. It's important to get our research from these articles so we can have a better understanding of the sexual health of during postpartum and shine more light on the severity of postpartum in low- and middle-income countries.

In conclusion, women's sexual health while dealing with postpartum is greatly overlooked in low- and middle-income countries. Majority of the research focuses on women can return to sexual activity. Postpartum period in sexual health is very limited and needs to be more focused on. Postnatal counseling and no judging services for women can help them better get through the changes happening to their body and to overall improve their sexual health.

References: A scoping review on women's sexual health in the postpartum period: opportunities for research and practice within low-and middle-income countries – ProQuest

UP-16 Sheniqua Carter-Beharry, Zacaria Jackson

Postpartum Depression and Its Impact on Maternal Mental Health and Family Dynamics: A Narrative Review of Current Research

Postpartum depression (PPD) is a maternal mental health condition that can impair emotional functioning, bonding, and daily stability during the first year after childbirth. PPD also affects families by increasing partner stress, disrupting communication, and influencing infant development through reduced maternal responsiveness. This project examines key biological, psychological, and social contributors to PPD and how these factors shape overall family functioning.

Methods: A narrative literature review will be conducted using peer reviewed studies from CINAHL, PsycINFO, and PubMed. Articles will be analyzed for themes related to risk factors, family impact, and evidence based, family centered interventions.

UP-17 Lily Conner, P. Lawson Killough, Junebug Rahim, Maria Markosov

Stopping Brain Cancer at Its Root: Preventing Tumors from Coming Back

Glioblastoma (GBM) remains the deadliest primary brain cancer, largely because tumors almost invariably recur after standard therapy. Although surgery, radiation, and chemotherapy can reduce tumor burden, a small population of glioma stem cells (GSCs) survives treatment and regenerates the tumor. These cells possess self-renewal capacity, resist therapy, and re-establish tumor architecture. While prior studies have identified transcriptional programs that define tumor-propagating cells, the upstream regulatory mechanisms that maintain this stem-like identity remain insufficiently understood. Addressing this gap is essential for developing strategies that prevent recurrence rather than temporarily controlling tumor growth.

This project asks whether CDK5, a kinase normally active in post-mitotic neurons, functions as an upstream regulator of the transcriptional network that sustains GSC identity and tumor-initiating capacity. Our previous work demonstrated that CDK5 directly activates the transcription factor CREB1 in glioblastoma stem cells, independent of classical signaling pathways. We hypothesize that CDK5-activated CREB1 maintains the core tumor-propagating

transcriptional program and that pharmacologic or genetic disruption of this axis will collapse GSC identity while sparing normal neural stem cells.

To test this hypothesis, we will use patient-derived glioblastoma stem cell models and matched human neural stem cells. The study will combine molecular and functional approaches, including chromatin-based assays to assess CREB1 binding at target gene promoters, gene expression analysis to evaluate transcriptional changes, and genetic suppression or pharmacologic inhibition to disrupt CDK5 activity. Functional assays of self-renewal and proliferation will determine whether interference with CDK5 signaling reduces tumor stem cell capacity. Parallel experiments in normal neural stem cells will assess relative specificity and define an initial therapeutic window.

We expect that CDK5 inhibition will reduce activation of the tumor-propagating transcriptional program and impair GSC self-renewal, while having limited effects on normal neural stem cell function. If validated, these findings would identify CDK5 as a previously unrecognized upstream regulator of glioblastoma recurrence and establish a mechanistic basis for targeting cancer stem cells at their regulatory source.

By focusing on the root cause of tumor re-initiation rather than transient tumor reduction, this research aims to shift the therapeutic paradigm in glioblastoma from short-term control to durable suppression of recurrence.

UP-18 Jaeyoung Sim, Robert Linsley, Elijah Hawkins

"Rising Rates of Sexually Transmitted Infections Among the Geriatric Population (Ages 60+)"

Why are sexually transmitted infection (STI) rates rising among adults aged 60 and older? This research examines the social factors creating this rising trend and shows that ageist ideals are compromising geriatric sexual health. An analysis of data sourced from the CDC and WHO reveals that while sexual activity remains high, the limited use of protection, continuous partner changes, and provider-side bias fuels infection rates. This research demonstrates that silence in clinical settings (nursing homes, etc) discourages healthcare-seeking behavior. Ultimately, this research argues that the integration of routine screenings, continued sexual education and awareness, and open communication into geriatric care are paramount in reducing transmission and normalizing sexual health.

UP-19 Caitlin Adorno, Caroline Batista Fermin

The Effects of Alcoholism on Family Dynamics Across America and Latin Countries Alcohol abuse is a medical condition in which a person cannot control their alcohol consumption, often leading to emotional, financial, and psychological disruptions in their families. Research supports that alcohol abuse affects men and women differently, causing different impacts on family dynamics and socioeconomic status. This study will focus on the impact of alcoholism on familial roles,

relationships, and communication patterns in families across the United States and Latin America. This study will also show how sociocultural influences such as family structures and environmental factors can lead to an increase in alcohol abuse in families. Additionally, this research will analyze the correlation between a family's economic background and their access to intervention resources and how these factors can further disrupt family dynamics.

UP-20 Rosalee Kreischer, Yasmin Harris

The Acute Effects of Passive Stretch Duration on Active Shoulder Flexion and Extension Range of Motion

The purpose of this study is to examine whether stretch duration influences acute improvements in shoulder flexion and extension active range of motion (ROM). Specifically, this project investigates whether performing the Modified Sleeper Stretch (MSS) and Modified Cross-Body Stretch (MCBS) for 15, 30, or 45 seconds produces significantly different improvements in active shoulder ROM among healthy college-aged individuals. The guiding research question is: Does increasing the duration of passive stretching result in greater immediate improvements in shoulder flexion and extension ROM?

Stretching interventions, including static, dynamic, active, passive, and proprioceptive neuromuscular facilitation techniques, have consistently shown improvements in joint ROM across muscle groups and populations. However, while the general effectiveness of stretching is well established, limited research has isolated stretch duration as a variable influencing acute shoulder ROM. Much of the literature emphasizes chronic adaptations or compares stretching modalities rather than examining time under stretch. As a result, duration recommendations are often inconsistent. This study addresses that gap by isolating stretch duration as the primary independent variable.

Fifteen college-aged participants without current shoulder pathology were recruited. Eligibility will be confirmed using the Disability of the Arm, Shoulder, and Hand (DASH) questionnaire. Participants were randomly assigned to one of three duration groups (15, 30, or 45 seconds). A pre–post quasi-experimental design will be used, with baseline and post-intervention measurements of active shoulder flexion and extension obtained via manual goniometry. Participants will perform the MSS and MCBS according to their assigned duration before post-testing.

It is hypothesized that longer stretch durations will produce greater acute improvements in active shoulder ROM, with the 45-second condition resulting in the largest gains. If supported, these findings may help guide evidence-based stretching prescriptions by informing practitioners whether longer durations meaningfully enhance immediate mobility outcomes compared to shorter bouts.

UP-21 Oscar Lopez-Bolanos, Patrick Cassibry

Design and Security Hardening of a Hybrid Private Cloud Architecture for Small Business Environments

Small businesses often rely on insecure remote access and unmanaged file sharing, increasing risk of ransomware and data loss. This project designs and hardens a hybrid "private cloud" environment that delivers secure file sharing and administrative remote desktop while remaining feasible for small IT teams. The lab uses pfSense for network segmentation and firewall enforcement, Tailscale or site-to-site VPN for remote connectivity, Nextcloud for private file services, RustDesk for controlled administrative access, and Wazuh for centralized monitoring. We establish a baseline "flat" network, then implement hardening controls: least-privilege firewall rules, service exposure reduction, and endpoint/host logging. Using repeatable scans and authentication/traffic tests, we compare observable security telemetry before and after hardening (blocked lateral movement, reduced exposed ports, and increased actionable alerts in Wazuh). The result is a documented reference architecture and evidence-based workflow that demonstrates how layered controls measurably improve security for small-business hybrid cloud deployments. All configurations are documented.

UP-22 Rico Mora

The Transformation of the Roman-Christian Apocalyptic Tradition Through Pseudo-Methodius

The crisis of the Arab conquests of the mid-to-late 7th century CE were nothing short of a disaster for the Roman Empire, and for the eastern Christian world. As time progressed, so too did apocalyptic writings and homilies. The Apocalypse of Pseudo-Methodius composed sometime in the latter half of the 7th century has emerged as one of the most influential Christian works in Late Antiquity and the Middle Ages. By evolving the pre-existing Christian apocalyptic traditions and introducing elements of local Syriac Christianity and political polemics, the Apocalypse of Pseudo-Methodius is a sharply political apocalyptic text which reinforces the role of the Roman Empire as the fourth Danielic kingdom and re-affirms the primacy of Rome as both a secular political power and divine intermediary of Christ to the mortal world. Through Pseudo-Methodius' reworking and adaptation, a new Christian eschatological ideology is developed and rapidly transmitted through the Christian world, further enforcing the primacy of Rome throughout the Near East and well into Europe, where his rhetoric will continue to influence apocalyptic literature for centuries after.

UP-23 Riley Seguin , Jill Walton, Valeria Saer

Low libido In women who suffer from endometriosis and PCOS

Low libido in a woman is an important yet frequently overlooked concern in those who suffer from gynecological disorders such as Endometriosis and Polycystic ovary syndrome or also known as PCOS. These conditions are associated with hormonal imbalances, chronic pain, and even psychological distress to some, which may negatively affect sexual health and in some instances affect a woman's quality of life. Existing research on contributing factors, and impacts of sexual dysfunction in individuals diagnosed with endometriosis and PCOS is a constant study.

Additionally, this essay will highlight research showing that women with these diseases had far greater rates of low libido than the general population, especially when it comes to sexual desire, arousal, and pain during sexual activity. These results also seem to be influenced by factors such as dyspareunia, body image concerns, infertility, and mental health issues. In recent studies it is also shown that women's symptoms are commonly downplayed or ignored in clinical settings and the home, which results in insufficient treatment and delayed diagnosis which could be anywhere from a 7-10 year delay in. Furthermore, understanding the relationship between gynecological disorders and sexual dysfunction highlights the need for increased clinical awareness and a more holistic approach to patient care that addresses both physical and psychosocial aspects of the toll Endometriosis and Polycystic Ovary Syndrome can have on a woman's body.

UP-24 Kailey Beasley, Novi Sandhu, Mary Ann Welter-O'connor, Jeremy Newton *The Role of Academic Anxiety in the Relationship Between Stress and Academic Performance*

Academic stress and exam-related anxiety are common experiences among college students and have been linked to impaired both cognitive functioning and academic performance (Ansari, & Iqbal, 2025). For students in higher education levels, prior research has demonstrated that elevated high levels of stress and anxiety has a negative impact on university students' physiological and psychological states, which results in the inability to complete their studies effectively (Zheng et al., 2023). From a cognitive perspective, heightened anxiety has been shown to interfere with core executive functions such as attention, working memory, and cognitive flexibility (Hood et al., 2015). A cognitive overload can impair encoding, retrieval, and problem-solving during examinations, thereby directly affecting performance outcomes. While the existing research establishes a negative relationship between stress and anxiety, further investigation is needed to clarify how academic anxiety operates within this relationship as a mediator.

The present study examines the relationship between academic stress, academic anxiety, and academic performance among undergraduate psychology students at Columbus State University. The participants will be recruited from the undergraduate psychology courses and will complete an online survey through Qualtrics, completely anonymous to minimize response bias and encourage honest reporting. In an academic research project, this strategy helps to preserve ethical sustainability while allowing the investigation of predictive relationships.

Students will be rewarded one SONA credit. The Perceived Stress Scale (PSS) will be used for measuring stress that students may encounter when relating to school work or studying for a major exam. The PSS will measure how stressed and overwhelmed a student might feel. It has a history of being clinically valid and reliable. Academic anxiety will be measured using the Academic Anxiety Scale from Ball State University, as it measures anxiety directly related to school work and exams. Self reported academic performance of GPA to reflect their overall academic performance and most recent major exam grade for immediate performance.

Demographics of age and gender will also be asked in the survey as potential covariates.

Accounting for these covariates gives control for their potential influence. Self reports may be linked to some biases and inaccurate answers. Participants may put a higher score than their GPA and exam grade for social desirability or response distortion to fit in with the societal standards of success or to project the grade they truly want. The risk also runs of participants' genuine incorrect recollection. To examine the data results, statistical software will be used (JASP) with the use of Pearson's correlation to identify preliminary relationships between stress, anxiety, and performance.

It is expected that higher levels of academic stress will be related to an increased academic anxiety, which will have a negative relationship with lower academic performance. It can also be hypothesized that academic anxiety will have a negative association with academic performance. As academic stress increases, students may experience heightened anxiety that interferes with concentration and academic performance. By studying the relationship between the current factors, this study will contribute to the already published research and growing literature on anxiety, stress, and performance. The findings may help future researchers contribute ways to reduce stress and eventually increase academic performance, and promote institutional efforts to

UP-24 Jackson Boatner

"Epigenetics: How the Environment Influences Gene Expression"

This study examines how environmental factors influence gene expression through epigenetics using evidence from peer-reviewed studies, animal models, and human research. Findings from experimental and observational studies to examine patterns of epigenetics across different environmental exposures were examined. Epigenetics refers to heritable changes in gene activity that occur without altering the DNA sequence itself. Environmental factors, diet, stress, and lifestyle behaviors can modify the chromatin structure, leading to changes in gene expression that affect health outcomes.

Findings indicate that early-life exposures, like developmental periods, can result in long-lasting epigenetic changes. Maternal nutrition impacts disease susceptibility. Exposure to environmental toxins, like heavy metals and endocrine-disrupting chemicals, has been shown to alter DNA methylation and histone modifications, which can disrupt normal cellular function. Evidence shows that changes in how our genes work can affect the immune system and inflammation.
This links what we are exposed to in our environment with a higher risk of autoimmune and inflammatory diseases. Chronic stress and psychosocial factors are involved in epigenetics. Changing genes that are related to how we handle stress can raise the risk of mental health problems.

Epigenetics explains how outside conditions can affect our genes, which can be seen in the way we live our lives. Research shows that some changes in gene regulation can last into adulthood and can even be passed down to future generations. This emphasizes the lasting effects of

environmental exposures beyond just the person who experienced them. Lifestyle changes, such as better nutrition, more physical activity, and reduced stress, can lead to positive changes in our epigenetics. This suggests that epigenetic changes are reversible. Understanding these points is important for preventing diseases and improving public health. Epigenetic research helps close the gap between genetics and environmental science by showing how external factors shape our bodies. More research in this field can help create targeted programs and policies. These programs and policies look to reduce environmental risks and improve long-term health outcomes. This study shows how our environment and genes work together to affect our health and risk of disease.

Keywords: epigenetics, gene expression, environmental exposures, health outcomes, DNA methylation, histone modifications, autoimmune, inflammation

UP-25 Desteny Lyons, Amaya Wilder, Halia Panoke

Bonus Parents or Bonus Problems

This specific Research on family transitions after divorce shows that a child's adjustment after parental separation isn't shaped by the separation itself. Yet by the quality of relationships, they maintain each parent. Although new families will form after separation, it is likely the child will need time to adjust to this new life they are having to experience. Studies show that children demonstrate better emotional and behavioral outcomes when they have a stable home to come home to. When parents in both homes are enforcing the same rules, the child is more likely to have fewer manipulation issues. Studies show that manipulation issues are easy to develop when a child is living in two separate homes. Although coparenting may come with many benefits, including shared responsibilities, along with financial stability. Positive parent–child and stepparent–child relationships are associated with lower levels of internalizing problems over time.

References

Schein, E. (2021, August 12). Co-Parenting in a Blended Family: Challenges and Perspectives. Schein on Divorce. https://scheinondivorce.com/posts/co-parenting-in-a-blended-family-challenges-and-perspectives

Repond, G., Darwiche, J., & Antonietti, J. (2024). Unlocking family harmony: Coparenting as a moderator of parenting and stepparenting difficulties on children's adjustment. Family Transitions, 65(8), 517–540. https://doi.org/10.1080/28375300.2024.2430924

UP-26 Tennyson Smith, Zameria Butler,Kimberly Nguyen, Zahria Gaddis

The Effects of Narcissistic Parenting on Childhood and Generational Trauma

The purpose of this research is to examine how narcissistic traits in parents influence family dynamics and can contribute to long-term psychological and emotional trauma for their children. This behavior can play a crucial role in the development of children, begin generational trauma, and can lead into family violence. Peer reviewed and scholarly articles state that individuals who display narcissistic behavior tend to display a need of control, lack of empathy, emotional manipulation,

and an overwhelming sense of self-importance. Within a family environment, these behaviors can cause psychological, emotional, and physical abuse. This foundation heightens a risk of creating a household of fear, instability, and chronic stress. Children who are raised in these environments are vulnerable to depression, unhealthy emotional development, and impaired self-esteem. With time, these effects may contribute to generational trauma where dysfunctional coping mechanisms, unresolved psychological distress, and patterns of emotional or violent abuse are passed down unconsciously. Being able to understand and visually recognize narcissistic behavior and personality within families is essential for preventing family violence, negligence in kids, and mimicking generational trauma, along with finding support for a healthier personality and family outcome.

Keywords: narcissistic parenting, family dynamics, generational trauma, child development, family violence

UP-27 Zoya Babb, Sophia Williams

The Effects of Sleep Position and Quality on Shoulder Range of Motion, Mood, and Comfort Following Acute Stretching

Stretching, the elongation of muscle tissue to increase joint range of motion (ROM), is vital for functional performance. However, research shows that sleep posture (lateral, supine, or prone) significantly influences shoulder health. Research also suggests that lateral sleeping is linked to increased subacromial pressure and rotator cuff degeneration. Furthermore, poor sleep quality and negative moods can decrease stretch tolerance and alter discomfort perception. Despite these links, research into how individual sleep factors specifically affect ROM remains limited.

This study investigates how habitual sleeping positions and sleep quality influence shoulder joint comfort, ROM, and force production following acute stretching. Twelve injury-free college students (ages 19–24) will be screened using the Disability of the Arm, Shoulder, and Hand questionnaire (DASH). Eligible participants will complete the Pittsburgh Sleep Quality Index (PSQI) and the Profile of Mood States and Anxiety scale (PMA). Baseline measures include body composition, height, weight, and shoulder internal rotation, flexion, and extension via goniometry.

Participants will perform a modified sleeper and cross-body stretch protocol on their dominant side for either 15 or 45 seconds. Following the intervention, ROM and comfort perception will be reassessed to determine if sleep and mood variables influenced the stretching outcomes. We hypothesize that lateral sleepers and those with poor sleep quality will exhibit reduced baseline ROM and greater discomfort during stretching. These findings aim to optimize shoulder mobility programs by integrating sleep-related variables into flexibility and performance training.

UP-28 Tiffany Golden, Devon Cushing

Titration of Aqueous Sodium Thiosulfate with Electrolytically Generated Iodine in a Cell Powered by a Photovoltaic Panel

In this study we proposed to develop a new undergraduate laboratory experiment for the titration of thiosulfate ions. This method involves an alternative power source using a photovoltaic panel. This titration method will be more economical and saves reagent volume. An alternative method of titration of aqueous thiosulfate with electrolytically produced iodide is presented. Aqueous iodide was oxidized to iodine in an electrolysis cell powered by a photovoltaic panel illuminated by an LED bulb. Electrolytically produced iodine was used for the chemical oxidation of thiosulfate. The end point of this titration was determined by visual change in the starch indicator from colorless to blue-black. The electrolytic charge was determined from the current and the time of electrolysis. Stoichiometric relations and Faraday's laws of electrolysis were then used to determine the concentration of thiosulfate. The effect of distance between the light source and the photovoltaic panel on electrolytic current was assessed. The electrolytic current decreased with the distance and the time of electrolysis increased to maintain the constancy of charge. Multiple trials of titration were performed and the average concentration of thiosulfate (0.0104 M) agreed with results obtained from the independent volumetric titrations (0.0099 M). The work was performed by the student authors as a supervised undergraduate research study

UP-29 Ashley Epps, Jarvis Evans

The impact of Physical Activity on mental health & Academic Performances (College Students Only)

High levels of stress, anxiety, and psychological strain among college students are associated with lower academic engagement and poorer performance. National data indicate that about 60–65% of U.S. college students report moderate to high stress levels, while fewer than 50% meet recommended physical activity guidelines. Research consistently shows that regular exercise is linked to reduced symptoms of depression and anxiety and improved psychological well-being in college-age populations. Moderate physical activity has also been associated with better concentration, cognitive function, and perceived academic performance. However, limited research examines mental health, academic engagement, and physical activity together in the same population. Addressing this gap could provide a clearer understanding of how student well-being and academic participation jointly contribute to overall wellness and academic success. The present study will adopt a quantitative cross-sectional design combined with in-person data collection. Students aged 18–25 years will receive brief, low-risk paper-based questionnaires. Physical activity will be assessed by a brief self-report measure of activity frequency. Mental health will be evaluated with the Perceived Stress Scale (PSS-10) and the short mood rating scale.

Hypotheses: College active students experience lower perceived levels of stress and increased academic engagement on average than other less physically active students. Accordingly, the findings from the study may have relevance to campus wellness programming and within physical

education programming designed to enhance students' overall health as well as engagement.

UP-30 Breanna McWhorter

Effect of Static Stretching Duration of the Shoulder Joint on Isometric Force Production

Static stretching is commonly used in warm-up routines, rehabilitation programs, and general workouts to help improve flexibility and joint range of motion (ROM); however, research suggests that static stretches of a longer duration immediately before performance or activity may temporarily reduce force production. Most research focuses on the lower extremities, while there is little to no research on the upper extremities. Given how important shoulder joint strength is in activities like resistance training, throwing, overhead sports, more research is needed on stretching for the upper extremities. The purpose of this study is to examine the duration of static stretching that would temporarily affect the force production of the shoulder joint. For this study a quasi-experimental design will be used on physically active participants completing 2 conditions: short stretch (15 secs) and a long duration stretch (45 secs). Before and after any stretching, the force production will be assessed with the Athletic Shoulder (ASH) test. It is hypothesized that longer-duration stretching will have reduced isometric force production as compared to short-duration, which should have minimal to no effect. The findings of this study may contribute to existing research of stretching and performance by helping to guide warm-up strategies for athletes, coaches, and overall physically active individuals.

UP-31 Rosalee Kreischer, Yasmin Harris

The Acute Effects of Passive Stretch Duration on Active Shoulder Flexion and Extension Range of Motion

The purpose of this study is to examine whether stretch duration influences acute improvements in shoulder flexion and extension active range of motion (ROM). Specifically, this project investigates whether performing the Modified Sleeper Stretch (MSS) and Modified Cross-Body Stretch (MCBS) for 15, 30, or 45 seconds produces significantly different improvements in active shoulder ROM among healthy college-aged individuals. The guiding research question is: Does increasing the duration of passive stretching result in greater immediate improvements in shoulder flexion and extension ROM?

Stretching interventions, including static, dynamic, active, passive, and proprioceptive neuromuscular facilitation techniques, have consistently shown improvements in joint ROM across muscle groups and populations. However, while the general effectiveness of stretching is well established, limited research has isolated stretch duration as a variable influencing acute shoulder ROM. Much of the literature emphasizes chronic adaptations or compares stretching modalities rather than examining time under stretch. As a result, duration recommendations are often inconsistent. This study addresses that gap by isolating stretch duration as the primary independent variable.

Fifteen college-aged participants without current shoulder pathology were recruited. Eligibility will be confirmed using the Disability of the Arm, Shoulder, and Hand (DASH) questionnaire. Participants were randomly assigned to one of three duration groups (15, 30, or 45 seconds). A pre–post quasi-experimental design will be used, with baseline and post-intervention measurements of active shoulder flexion and extension obtained via manual goniometry. Participants will perform the MSS and MCBS according to their assigned duration before post-testing.

It is hypothesized that longer stretch durations will produce greater acute improvements in active shoulder ROM, with the 45-second condition resulting in the largest gains. If supported, these findings may help guide evidence-based stretching prescriptions by informing practitioners whether longer durations meaningfully enhance immediate mobility outcomes compared to shorter bouts.

UP-32 Chance Hall, Tucker Starling

The Effects of Transcutaneous Electrical Nerve Stimulation (TENS) on Knee Flexion Range of Motion and Perceived Effectiveness

"Transcutaneous electrical nerve stimulation (TENS) is a commonly used therapeutic modality in exercise science, rehabilitation, and athletic training settings to reduce pain and improve recovery. However, limited research exists examining the immediate functional effects of TENS compared to other recovery methods such as heat therapy in healthy, college-aged populations. The purpose of this study is to determine how effective TENS is for improving bodily function, specifically knee flexion range of motion (ROM), and to evaluate participant perceptions of its effectiveness compared to heat therapy.

A sample of 8–12 college-aged, (18-25 years) will be recruited for this study. Each participant will report to the lab twice to complete both conditions, and the conditions will be counterbalanced. Participants will get screened prior to testing using a stretching questionnaire, and a previous injury or surgery questionnaire. Individuals with a history of significant musculoskeletal injury or surgery will be excluded to ensure participant safety and reduce confounding variables. Participants will also be asked about prior experience with TENS to determine familiarity with the modality.

Participants will be assigned to receive either TENS or direct heat for 10 minutes after screening. Knee flexion will be measured with a goniometer before and after the TENS or heat application. Additionally, participants will rate their experience with either treatment. TENS will be applied using standard electrode placement procedures to ensure consistent stimulation of the target area. Heat will be applied directly using a safe and controlled gel heat pad to maintain consistency across participants.

ROM readings were recorded and required approximately five minutes per participant. These measurements will serve as the primary quantitative variable used to evaluate the effectiveness of

TENS compared to heat therapy. Following ROM assessment, participants will complete a preferred method questionnaire, which asks them to identify which modality they believe was more effective and comfortable. This questionnaire will take approximately five minutes to complete and provides data regarding participant perception and satisfaction. Results may also inform exercise science professionals, athletic trainers, and physical therapists on the practical effectiveness of TENS for improving joint mobility and supporting overall physical performance in active individuals.

UP-33 Navjot (Novi) Sandhu, Kailey Beasley, Mary Ann Welter-O'Conner

Perceived Stress and Everyday Cognitive Failures in Undergraduate Students: The Role of Sleep Quality

Sleep difficulties and academic stress are prevalent among college students and have been linked to deficits in several core cognitive processes that support academic success. Working memory supports the short-term storage and manipulation of information, executive functioning supports planning, inhibition, and flexible thinking, and attention allows students to focus on relevant material while ignoring distractions. Prior research indicates that high levels of stress impair executive control, working memory, and attention (Shields et al., 2016), and that insufficient or poor-quality sleep is also associated with reduced cognitive performance in these same domains (Lim & Dinges, 2010). Disruptions in these cognitive systems often appear in daily life as cognitive failures, such as forgetting tasks, losing focus, or making minor errors (Broadbent et al., 1982). Although existing research links stress and sleep to cognitive functioning, fewer studies have examined how sleep quality may help explain the relationship between perceived stress and everyday cognitive failures in college students.

This study examines the relationships among perceived stress, sleep quality, and self-reported cognitive failures using an online survey. Participants will complete the Perceived Stress Scale (PSS; Cohen et al., 1983), the Cognitive Failures Questionnaire (CFQ; Broadbent et al., 1982), which measures the frequency of everyday attention and memory lapses, and the Pittsburgh Sleep Quality Index (PSQI; Buysse et al., 1989), which assesses overall sleep quality and sleep-related disturbances over the past month. Basic demographic information, including age, gender, and year in school, will also be collected.

It is hypothesized that higher perceived stress will be associated with poorer sleep quality and more frequent cognitive failures, and that sleep quality will help account for the relationship between stress and cognitive failures. More frequent cognitive failures have important real-world implications for college students, as these lapses can interfere with studying, time management, exam preparation, and classroom engagement. Over time, these difficulties may contribute to lower academic performance, increased academic stress, and reduced confidence in academic abilities. By clarifying how sleep quality contributes to the stress–cognition relationship, this study may help inform campus-based initiatives such as sleep education programs, stress-management workshops, or wellness interventions designed to promote healthier sleep

habits and coping strategies. These initiatives could help students maintain better cognitive functioning in their daily academic tasks and support overall academic success and well-being.

UP-34 Mary Ann Welter-O'Connor, Kailey Beasley, Novi Sandhu, Mariah Stepney
Cognitive Impairment vs. Enhancement: A Study Between Perceived Stress Levels and Subjective Working Memory Efficacy.

Stress affects many aspects of daily life, particularly for college students who must navigate high-stakes learning environments. Acute stress impacts cognitive functions, such as attention, focus, and memory, and can significantly hinder academic performance. While established literature confirms a Yerkes-Dodson (bell curve) in which moderate stress aids performance but high stress inhibits it, less is known about the optimal stress levels required specifically for learning versus those necessary for effective memory retrieval. According to Vogel and Schwabe (2016), Moderate levels of difficulty, or "cognitive load," can enhance neuroplasticity and long-term cognitive development. Strategic challenges in a learning environment build resilience and critical thinking more effectively than keeping the workload as low as possible. It seems that further research is needed to differentiate the effects of stress on memory and learning. This study investigates the interplay between working memory, objective stress levels, and subjective stress perceptions utilizing validated instruments such as the Perceived Stress Scale, Memory Awareness Rating, and the Stress Mindset Measure. Research examines how varying stressors affect distinct cognitive processes. We hypothesize that individuals reporting high working memory efficacy will correlate with low-to-moderate stress levels, suggesting an optimal range may enhance cognitive function and endurance.

Methodology: This study employs a quantitative, cross-sectional survey design to investigate the correlational relationships between subjective stress mindsets, perceived stress levels, and self-reported working memory efficacy. Participants will complete a battery of three validated psychometric scales delivered via an online platform:
Stress Mindset Measure (SMM): Assesses whether individuals perceive stress as enhancing or debilitating.

Perceived Stress Scale (PSS-10): Measures the degree to which life situations are appraised as stressful over the past month.

Memory Awareness Rating: Evaluates subjective perceptions of working memory capacity and metacognitive awareness of memory performance.

Data collection will be conducted through an anonymous online survey. Participants will first provide informed consent before progressing through the randomized presentation of the SMM,

PSS, and memory scales to mitigate order effects. Quantitative data will be analyzed using Pearson correlation coefficients and multiple regression models to determine if stress mindsets or perceived stress significantly predict reported working memory performance. Participants will be recruited from the undergraduate student population via SONA, earning them 1 SONA credit.

Data analysis will be performed in JASP, ensuring transparency. We will compute descriptive statistics (means, SDs, Cronbach's alpha) for PSS-10 and SMM scores, run a correlation matrix to explore relationships, and use multiple regression to analyze predictors of subjective memory awareness, with assumptions (normality, homoscedasticity) verified beforehand.

It is believed that the findings from this research will show that those experiencing moderate levels will have a higher perceived memory. Moderate levels of arousal can enhance memory formation, attention allocation, and might not just improve recall but also boost a student's metamemory (their awareness and confidence in their own memory processes). The findings from this research could provide valuable insights for students and faculty as well as future research, assisting in the development of optimized learning strategies.

UP-35 London Von Every

Derivatization of Perfluorooctanesulfonic Acid by Isobutyl Chloroformate for Extraction and Analysis by GC-MS

Per- and polyfluoroalkyl substances (PFAS) are man-made 'forever chemicals,' meaning they do not naturally break down once they enter the environment. They often enter a water supply through improper waste disposal or human activity, where they may accumulate within the bodies of aquatic life. This research project aims to eventually analyze fish flesh samples from the Chattahoochee River via gas chromatography-mass spectrometry (GC-MS) for the presence of PFOS, or perfluorooctanesulfonic acid, a specific PFAS pollutant. To do so, PFOS must first be reliably derivatized into esters, as it is too stable to properly evaporate during GC-MS analysis. Currently, esterification via isobutyl chloroformate is being investigated as a reliable method for sample preparation. When combined with selected ion monitoring (SIM) scans, the esterified PFOS will hopefully be detectible at trace concentrations, allowing for accurate analysis of homogenized fish muscle tissue matrixes. Once this method is firmly established, it will be used on a series of spiked flesh standards, then on wild caught samples from the Chattahoochee, as a vital step in the analysis process.

UP-36 Madeleine Corrao, Liam Aycock, Camille Benjamin, José Delgado, John Hood, Micheal Johnson

Research Initiation Award: A NASA Award to Engage in Research of Active Galactic Nuclei and Near Earth Objects

The Westrock Observatory (WRO) recently received a NASA Research Initiation Award (RIA) enabling it to complete major upgrades to its imaging and observatory systems. These upgrades

include a new high-resolution camera, filter wheel, and filters to the imaging system and a new mount and automated system for the observatory's telescope and dome. These new systems will improve our ability to monitor extra-galactic sources such as Active Galactic Nuclei (AGN) by filtering out light pollution and improve our telescope tracking. Additionally, these upgrades will allow us to provide orbital data on Near-Earth Objects (asteroids and comets). With this research, we hope to demonstrate the feasibility of small to medium sized observatories to add and enhance current data on both AGN and NEO monitoring.

UP-37 Elijah Walker

Isolation of Volatile Compounds in Artemisia absinthium Stems for Bioactivity Testing

Natural products chemistry is the study and use of chemicals derived from natural sources. This field is useful in drug discovery as many natural products show bioactive properties. Some of the most important drugs in modern medicine are derived from natural products, such as morphine from the opium poppy and penicillin from the mold Penicillium chrysogenum. Artemisia absinthium (also known as common wormwood) has been used in traditional medicine for centuries across the globe. A. absinthium has shown a wide range of bioactivity including antibacterial, anti-tumor, antipyretic, antifungal, etc. This study seeks to isolate and identify, via GC-MS analysis, specific compounds within A. absinthium responsible for its bioactive properties.

UP-38 Jenifer Castillo

Intelligent Heart Rate Measurement Solution for Elderly People in Rural Regions and Developing Countries

It is a critical issue for elderly people to obtain fast and convenient healthcare procedures, especially for people from rural regions and developing countries. Both the time cost and financial cost for healthcare can be partially eliminated and some symptoms can be predicted and detected earlier if some simple tests can be realized at home with low cost and instant measures. This project presents the development of a wearable system for real-time heart rate monitoring using the MAX30102 sensor and an ESP32 microcontroller. The system can measure heart rate, process the data, and display the results on a small display, while also storing short-term data in internal memory for potential diagnosis. A rechargeable battery and USB-C charging module allow portable use, and built-in Bluetooth enables future wireless communication. This highly integrated system is a simple and reliable design. It can monitor instant heart rate measurements and assist doctors in conducting certain procedures once the heart rate is abnormal.

UP-39 Aleksandr Ball, Sutton Boone, JB Mcghee, Sanaa Mitchell

Examining Older Patients' Trust in Artificial Intelligence for Health Care Information This study investigates older patients' perceived trust of Artificial Intelligence (AI), specifically regarding their health information. Although previous research has shown older adults are hesitant towards the use of AI in their health care because of multiple factors, such as perceived AI's capability, technology acceptance and literacy, willingness to engage, but less is known about their perceived

levels of trust, specifically, depending on perceived privacy concerns. To investigate this, we used a survey and collected data from the senior center, approximately using fifty participants and using ten to fifteen survey items. Our key variable items include perceived level of trust and perceived privacy concerns and our data was analyzed using Jamovi. This study indicated that older adults' attitudes reflect a lower perceived trust of AI and perceived levels of privacy concerns negatively predict trust in AI for health information among older adults. Therefore, there is a negative relationship between trust and attitudes towards AI. Furthermore, our study suggests that trust is a major contributing factor in understanding the attitudes of older adults' and a possible pathway to increase the acceptance of older adults', requiring further, extensive research.

UP-40 Anderson Knap, William Smith

Then and Now, The Changing Space of Columbus

"For this project we will be focusing on three major sections of the modern history of Columbus. We will be making an ARCGIS Story map of the history of the Mills here from the Civil War to their eventual downfall. Next, we will focus on Urban Transport Systems. Afterwards, we will focus on the urban design of Columbus. This will start with the initial grid system, then moving to the pre-World War Two suburbs. From here it will move to urban spawn that comes with the post-World War Two years and finally ending this with the urban revitalization and gentrification. We picked these because of the impact they have had on the design of Columbus over the years.

The first section will highlight the Mills that made up much of the Columbus Economy. From there we will look at the growth of the textile industry in Columbus throughout most of the 19th and 20th century. Afterwards we will look at the downfall of the textile industry in Columbus. Finally, we will end at the development of the service industries such as Aflac and TSYS.

The second section will focus on the transportation systems of Columbus over the years and how they evolved. The project will start with original transportation systems which Columbus relied on to export materials such as shipping. From there we will be focusing on the Railroads in Columbus such as the Central of Georgia, Southern and Georgia and Alabama railroads and eventually making it to Norfolk Southern. While doing this we will also be talking about the Columbus Tram system. The next part of this section will talk about the arrival of the automobile and eventually end with the Eisenhower highways system and the J.R. Allen freeway.

The last section will be focusing on the way that the Urban Layout of Columbus starting with the grid system that Columbus was originally planned out on. Next, we will examine the suburbs that develop outside of Columbus as the city continues to grow and their design. Eventually moving onto the urban spawl that we see in the Post-World War Two years and throughout the late 20th century. This section will end with the Revitalization of Downtown Columbus and other efforts to revitalize historic structure and areas of Columbus.

UP-41 Ashlee Thomas

Understanding Female Orgasm Difficulties

"Female orgasm difficulties are a common topic within human sexuality and continue to be misunderstood. Many women report difficulty achieving orgasm, particularly during partnered sexual activity, which has led to long standing misconceptions about how female sexual response works. Unlike male orgasm, which is often described as straightforward and consistent, female orgasm is influenced by physical, psychological, emotional, and social factors. The purpose of this study is to examine the most common factors that contribute to female orgasm difficulties and to explore how stimulation methods, mental arousal, emotional comfort, and communication with partners affects sexual satisfaction. Information for this study will be gathered through a review of peer-reviewed journal articles, academic databases such as PubMed and Google Scholar, and established human sexuality research. Research in human sexuality shows that female orgasm is complex and varies greatly among individuals. Some women experience orgasm easily, while others may struggle or only reach orgasm in certain situations. By addressing these factors, this study highlights ways to improve sexual satisfaction and overall sexual well-being among women.

Keywords: Female orgasm, sexual dysfunction, psychological factors

UP-42 Hannah London-Janicki, Abi Roberson, Lily Southwick, Kiersten Strother *Technology Anxiety, Trust, and Avoidance of AI-Enabled Technologies Among Older Adults*

This study explores how older adults interact with artificial intelligence (AI) technologies. Prior research has focused primarily on older adults' AI use in social media and healthcare settings; however, limited attention has been given to broader AI use and the factors that influence older adults' willingness to engage with these technologies. The purpose of this study is to investigate the extent to which technology anxiety and trust in AI-enabled technologies predict avoidance behaviors. A survey was conducted to quantitatively assess participants' levels of technology anxiety, trust in AI-enabled technologies, and avoidance behaviors related to these technologies. Additionally, a set of interviews was conducted in order to gain deeper insight into participants' personal experiences with AI, helping to explain the underlying reasons for these behaviors within their daily interactions with technology. Results showed that higher levels of technology anxiety and lower levels of trust were associated with greater avoidance of AI-enabled technologies. Overall, this study aims to clarify how psychological factors shape older adults' engagement with AI, providing foundational knowledge to inform the development of interventions that reduce barriers and promote more inclusive technology use among older adults. The findings contribute to existing theories of technology adoption while offering practical guidance for improving AI's accessibility and design for older populations.

UP-43 Reese Henry

The Challenges of Prediabetic Pediatric Intervention

Prediabetes is a chronic condition where the patient's blood glucose levels are not yet high enough

to meet the diagnostic criteria for diabetes type 2. Youth who are at risk of diabetes are often overweight (BMI >81) or obese (BMI >91). In the U.S. population, the prevalence of types 1 and 2 diabetes are expected to quadruple from 2010-2050 in people under 20.

In a family, we often experience a shared lifestyle. It is essential for guardians to be mindful of their food choices, as creating healthier habits can help prevent pre-diabetes, reduce financial strain, and lessen concerns about future health complications. In many cases, a pre-diabetes diagnosis can serve as a wake-up call for the whole family, offering an opportunity to work together toward a healthier lifestyle.

When looking at targets of intervention for pre-diabetes prevention, the group at greatest risk of diabetes are young, low socioeconomic bracket black Americans. In 2023, 1 in 4 black Americans faced food insecurity. Low socioeconomic brackets for all races are often in "food deserts"- swathes of communities without direct access to healthy foods such as fresh vegetables and fruits. These communities would benefit most from family health education, household diet intervention, community action, and policy change that would support healthy eating behaviors. The goal of this poster is to bring awareness, and advocate for these intervention strategies for families at risk of developing diabetes.

Keywords: *Prediabetes, Prevention, Intervention, Family Health, Socioeconomic Status, Food Insecurity, Food Deserts, Health Education, Household Diet, Policy Change, Black Americans*

UP-44 Adrianna Harris, Felicia Starkes, Patrice Porter, Reginald Copeland Jr.

Digital Ageism Internalization and Digital Exclusion Anxiety Among Older Adults

As society evolves in digitization, older adults face growing pressure to engage with technology for essential services, healthcare access, financial institutions, social engagement, and civic participation. This study investigates the relationship between digital ageism internalization and digital exclusion anxiety among older adults with an analysis of the role of education in that relationship. Although previous research has shown a relationship between digital literacy and technology engagement among older adults, less is known about how the internalization of age-based stereotypes in digital contexts specifically contributes to digital exclusion anxiety among older adults. A cross-sectional survey design will be employed to collect data from a total of 25 participants aged 60 years and older recruited from Columbus, Georgia. Participants will complete self-report surveys assessing digital ageism internalization, digital exclusion anxiety, education, and demographics including age, gender, and frequency of technology use. It is hypothesized that greater digital ageism internalization will be significantly and positively associated with higher digital exclusion anxiety among participants. Additionally, education is expected to influence this relationship, such that older adults with lower levels of education will report stronger associations between digital ageism internalization and digital exclusion anxiety compared to those with higher levels of education. These findings are expected to demonstrate that digital ageism extends beyond

external discrimination, producing significant psychological consequences that impact older adults' sense of belonging in digital environments, with education anticipated to reduce the impact of these psychological effects. This research represents an important step toward understanding how internalized ageism shapes the digital experiences of older adults, with implications for public health, social policy, and the promotion of inclusive digital environments for the aging population.

Keywords: digital ageism internalization, digital exclusion anxiety, education, older adults, internalized stereotypes

Sources Cited

UP-45 Skylar Kingsley, Victoria Hardy

Computational Development of Novel Azole Compounds for the Treatment of ALS

Amyotrophic lateral sclerosis (ALS) is a neurodegenerative disease targeting motor neurons in the central nervous system. While ALS pathology is characterized by excitotoxicity and the formation of TDP-43 protein aggregates, the underlying cause of sporadic cases is unknown. Nitrogen heterocycles, such as the benzothiazole-based drug Riluzole, have displayed efficacy in the treatment of ALS. In this study, a series of novel azole compounds will be designed using computational methods and optimized for the ability to interact with ALS-associated proteins and ideal pharmacological parameters. The computational software used to guide the design process includes TargetDB, Knime, RDKit, Chemaxon, and AutoDock for target identification, standardized data collection, structure filtering and preparation, and molecular-docking studies. The most promising candidates determined from these analyses will then be synthesized and evaluated for their therapeutic potential via the use of various cell culture assays.

UP-46 Caringtyn Fouts

Menopause and its Effects on Livelihood in Women

This study examines the relationship between menopause and its effects on the livelihood of women. Menopause is defined after at least twelve months of the absence of a woman's menstrual cycle, resulting in a discontinuation of reproductive capabilities. A woman typically experiences the three stages of menopause. This includes perimenopause, menopause, and post menopause. Several women may experience physical and emotional changes, including mood swings, fatigue, hot flashes, and self-esteem issues, which can be extremely taxing on a woman for the first time. In some cases, younger women may experience menopause earlier than expected, which is considered early menopause. Research shows that early menopause can also have the same negative effects on younger women as older women who are experiencing these drastic reproductive and abnormal hormonal changes. Expectations in the workplace and access to healthcare determine how women cope with lifestyle changes due to menopause. These lifestyle changes can include fluctuations in weight, mental well-being, and stress. These symptoms can also impact a woman's livelihood in ways that are commonly understood but not always discussed. When there is stigma or a lack of communication surrounding menopause, many women may feel

hesitant to seek support from employers, healthcare providers, or even family members. Acknowledging the significance of menopause and its effects on women daily is key to maintaining a well-balanced, healthy lifestyle. As researchers, we will gather information and data for this study through a review of peer-reviewed scholarly journal articles, public health reports, and credible medical databases such as PubMed and Google Scholar. Additional data may be collected through surveys or questionnaires distributed to women experiencing menopause to better understand how symptoms affect their workplace performance, mental well-being, and overall livelihood. Analyzing both qualitative and quantitative research will enable a comprehensive understanding of how menopause affects women socially, emotionally, and economically.

Keywords: Menopause, Hormonal changes, Women's Health, Mood swings, Lifestyle changes

UP-47 Donovan Stone, Blake Dugan

The Effects of Transcutaneous Electrical Nerve Stimulation (TENS) on Quadriceps Muscle Pain Compared to Heat Therapy in Young Adults

Transcutaneous electrical nerve stimulation (TENS) is a widely used, non-invasive device for managing pain in clinical and rehabilitation settings. Pain can negatively impact physical performance, daily activities, and overall quality of life, making effective treatment essential for maintaining functional movement. TENS works by delivering low-intensity electrical currents through surface electrodes placed near the area of pain, specifically over the quadriceps muscle of the knee joint in this study. Compared to invasive or pharmacological approaches, the TENS device provides a safer alternative with minimal health risk.

The purpose of this study is to determine whether TENS is more effective than a standard heat intervention in reducing perceived pain and improving functional outcomes in young adults aged 18 to 25 experiencing quadriceps muscle discomfort. A total of 15 participants will be recruited and screened prior to testing. Individuals with pacemakers or who are pregnant will be excluded from participation. Eligible participants will be randomly assigned to either a TENS group or a heat treatment group to allow for direct comparison between the two non-invasive interventions. The TENS group will receive treatment using a portable unit, with intensity adjusted to a comfortable and tolerable level. The comparison group will receive moist heat therapy applied to the same quadriceps region. Pain levels will be measured using a self-reported pain scale before and after treatment, while functional ability will be assessed through movement-based questionnaires related to knee function. It is hypothesized that participants receiving TENS will experience greater improvements in pain reduction and functional performance compared to those receiving heat therapy. Findings from this study may support the use of TENS as an effective and accessible recovery tool in clinical and exercise settings.

FGP-1 Kisun Kim, Youngrak Park

Experience-Based Evaluation of Generative AI: How Output Performance and Service Fit

Shape Expectancy Beliefs and Continued Use Intention

As generative AI increasingly serves as an everyday information source, understanding why users continue relying on AI-generated outputs has become a critical question. Moving beyond pre-adoption perspectives, this study conceptualizes generative AI use as an experience-driven process in which expectancy beliefs are updated through repeated interaction with GenAI. Thus, a post-adoption model was proposed by connecting experience-based evaluations including perceived generative AI output performance and perceived service-fit to performance expectancy, effort expectancy, and continued use intention.

Using two independent samples of early-stage generative AI users, the proposed model was tested. A total of 236 participants were included in the first sample, and 259 participants were included in the second sample for PLS-SEM analysis of the proposed model. In this model, four latent variables, including perceived GenAI output performance, perceived GenAI service fit, performance expectancy, and effort expectancy, were examined to explain early generative AI users' continued use intention. In both studies, performance expectancy and effort expectancy played a critical role in current users' continued use intention, showing that expectancy-related determinants were the core of generative AI use intention. On the other hand, output performance and service fit showed different patterns across samples, indicating that users form different beliefs depending on their experience-based contexts.

The results show that continued use of generative AI services does not merely rely on perceived AI output performance and service fit, but rather on re-evaluated performance expectancy and effort expectancy developed through users' experiences with generative AI. This study offers theoretical contributions to human–AI interaction research by extending technology acceptance perspectives and reconceptualizing expectancy formation as a post-adoption mechanism. This study also provides practical implications by highlighting the importance of optimizing both users' perceived output performance and service fit to support their long-term engagement with generative AI services. Across the two studies, the findings further reveal that expectancy beliefs consistently predict continued use intention, while experience-based evaluation of generative AI, output performance, and service fit vary by sample, underscoring the contextual and experiential nature of belief formation in generative.

FGP-2 Loriane Favoretto Hill, Ellen Martin

When Sports Are Built to Include: Adapting Tennis for Individuals with Autism Spectrum Disorder

With 1 in 36 children diagnosed with Autism Spectrum Disorder (ASD), the need for inclusive, evidence-based physical activity opportunities in schools and communities continues to grow. However, many traditional sport and recreation programs are not intentionally designed to address the unique learning, communication, sensory, and behavioral needs of individuals with ASD, limiting meaningful participation and skill development.

This poster presents the implementation and outcomes of ACEing Autism, a national nonprofit organization that delivers adapted tennis programming to create accessible, developmentally appropriate sport experiences for children, youth, and adults on the autism spectrum. Grounded in research in adapted physical activity and motor learning, the program incorporates visual supports, individualized instruction, behavioral strategies, and scaffolded skill progressions to promote engagement, motor competence, and social interaction across three service models: Community Youth, School-Based, and Adult.

At Columbus State University, the program is directed by Dr. Loriane Favoretto Hill and embedded within an interdisciplinary training framework that integrates teaching, service, and community engagement. Special Education faculty Dr. Hendricks and Dr. Blalock incorporate the program into coursework to prepare future educators to implement individualized supports. Dr. Da Silva contributes expertise in Board Certified Behavior Analyst practices to tailor sessions to participants' behavioral and learning needs. Health and Physical Education students trained in adapted physical activity provide direct instruction and mentorship, strengthening both participant outcomes and professional preparation. Dr. Hill also collaborates closely with Dr. Martin, whose longstanding commitment to inclusive physical education continues to inform program development.

Ongoing program evaluation guides continuous improvement, and practical tools and partnership strategies are shared to support replication across educational and community settings.

FGP-3 Kayla Nickerson, Nama Mandiga, Luna Fuentes

Reframing Reality: How Cognitive Behavioral Therapy Disrupts the Cycle of Body Dysmorphic Disorder

Mentor: Hillary Ellerman

Body Dysmorphic Disorder (BDD) is a psychiatric condition where an individual fixates on flaws of physical appearance when they appear normal (Nicewicz et al., 2024). In the American Psychiatric Association's (2013) Diagnostic and Statistical Manual of Mental Disorders (DSM-5), BDD falls under the Obsessive-Compulsive Disorder (OCD) umbrella and can be marked by social impairment, academic, and occupational dysfunction. According to research, BDD appears to have a significant impact on the social and emotional well-being of members of collectivist societies. An additional factor, such as religion, has been shown to influence the harsh maintenance of camouflage tactics and body checking. Early prevention habituation techniques can be essential in reducing the onset of BDD in younger populations. A collective of experimenters studied the cognitive and behavioral features of body image in relation to homosexual, heterosexual, and bisexual women. Their interpretation highlights how social and environmental contexts can influence our self-perceptions. The implications of this study emphasize which subgroups we should consider when diagnosing body dysmorphic and eating disorders. Cognitive Behavioral Therapy (CBT) mostly targets dysfunctional and negative thinking due to it being a main contributor to the distress of the

individual (Seligman & Kress, 2021). The fundamental basis of CBT is to identify, evaluate, and modify unhelpful thoughts or beliefs. This technique encourages behavior change and the development of problem-solving skills, facilitating a shift from maladaptive thinking, core beliefs, and perceptions to positive, growth-related behavior. Within the CBT model, specifically the intervention of cognitive restructuring, counselors can target a client's negative thought processing and, subsequently, their behaviors toward their body image. Common steps that can be considered goals for cognitive restructuring are acknowledging, challenging, and replacing maladaptive thoughts (Vallejo, 2023). Regardless of its effectiveness, this approach has limitations. There is a need for cultural inclusivity in the studies. Researchers explored best practices and other recommendations that include more qualitative sources, such as longitudinal studies, which can provide insight into the strength of the treatment effects over time.

FGP-4 Mary Claire Streat

Assessing Culvert Impacts on Water Quality in West Georgia Streams

Mentor: Troy Keller

"Culverts, large pipes, are widely used to transport rivers below human infrastructure. Although there is strong evidence that culverts cause downstream erosion and fragment populations of aquatic organisms such as fish, crayfish, and salamanders, there are few studies detailing how culverts impact water quality. To address this gap in the literature, we measured culvert influences on turbidity, dissolved oxygen, pH, specific conductance, and temperature, directly upstream and downstream of 24 independent culverts within the Chattahoochee River watershed. To account for seasonal variability in water quality, measurements were taken in the spring (n=12) and the summer (n=12). Statistical results from a series of paired t-tests revealed that culverts reduced water temperature, but had no detectable effect on turbidity, dissolved oxygen, pH, or specific conductance. Longer culverts were positively correlated with larger temperature reductions but had no association with any other water quality parameters. This study found that culverts have little impact on water quality, which strengthens the existing evidence that culverts are mostly a threat to stream biota as a physical barrier.

FGP-5 George Darrisaw III, Kayla Nickerson, Petrina Moore

The Impact of Counselor Wellness on Burnout and the Therapeutic Alliance

Mentor: Lauren Neal

Counselor burnout significantly affects the strength of the therapeutic alliance and the quality of care a counselor can provide, yet so many counselors fall victim to it. This project will review the literature on counselor burnout and propose a research study to assess how burnout impacts care and determine how it can be avoided. Recent research has explored the impact of counselor wellness on burnout, academic performance, and therapeutic alliance with clients. Cigrand et al. (2025) found that engaging in mindful practices improves self-compassion, reduces emotional fatigue, and diminishes symptoms of burnout. The primary research question is which wellness strategies have been identified as most effective in reducing burnout and strengthening the therapeutic alliance among practicing counselors? This proposal will examine preventive strategies

that counselors-in-training (CITs) and experienced clinicians can utilize to identify and alleviate the early signs of burnout. It also aims to identify effective approaches for maintaining a strong therapeutic alliance. Furthermore, the study will explore potential strategies for integrating these best practices into counseling education programs.

FGP-6 James Wiggins, Troi Hudson, Liam Aycock

Carbon Mineralization in a Laboratory Setting: Lessons Learned From Experimental Design

Mentor: Clinton Barineau

Carbon Capture and Sequestration (CCS) projects include laboratory and field based experiments designed to capture carbon at the point of emission (e.g., burning of fossil fuels) or from the atmosphere with the goal of isolating greenhouse enhancing carbon dioxide in geologic systems. CCS projects such as CarbFix in Iceland has shown that carbon dioxide dissolved in water and injected into subsurface rocks (e.g., basalt) resulted in sequestration of that carbon as carbonate minerals (e.g., calcite) with >90% of the injected carbon mineralizing within 1 year. In a laboratory CCS project developed here at CSU, we compare and contrast two experimental designs in which carbon dioxide is injected into a PVC pressure vessel in a mixed rock and water medium in order to test potential carbon mineralization in metamorphosed basalts (e.g., amphibolite). In one experiment, we introduced carbon into a pressure vessel as a gas using a commercial carbon dioxide tank, pressure regulator, and custom PVC pressure vessel. In a second experimental design, we introduce carbon in a solid state (i.e., dry ice) into a custom PVC pressure vessel. Both experiments have the goal of adding the maximum amount of carbon dioxide to the mixed rock and water system that does not exceed the pressure rating of the PVC vessel (280 psi). We discuss the relative design strengths and flaws of the two systems, as well as the limitations of the experiment regardless of design.

FGP-7 Daija Gibson

Reframing Sexual Assault and Intimate Partner Violence Through a Maternal and Child Health Lens: Implications for Prevention, Policy, and Practice

Mentors: Patricia Anafi, Carlene Robinson

Sexual assault (SA) and intimate partner violence (IPV) remain persistent public health challenges in the United States, disproportionately affecting women, families, and young adults. While these forms of violence have traditionally been addressed through criminal justice or behavioral health frameworks, they have been less frequently examined through a maternal and child health (MCH) lens emphasizing family systems, life course development, and upstream prevention. This project reframed SA and IPV as core MCH concerns and explored the implications of this perspective for integrated prevention, policy, and public health practice.

A structured literature review and secondary analysis of publicly available datasets and policy documents were conducted to examine how stress exposure, behavioral health risk factors, and institutional responses interact to influence violence risk across the life course. Analysis focused on

prevention strategies extending beyond individual behavior change to include relational health and coordinated systems of care. Findings revealed persistent gaps between existing prevention efforts and MCH-informed approaches that prioritize early intervention and family stability.

Reframing SA and IPV within MCH-highlighted opportunities to shift prevention from reactive response toward sustained, population-level health promotion. This work demonstrated that integrating MCH principles into violence prevention may strengthen cross-sector collaboration, improve equity in prevention practice, and support healthier developmental environments for individuals and families. The project contributes a conceptual foundation for advancing integrated prevention models within public health systems.

FGP-8 Abigail Murphy

Identity and presentation effectiveness for job seekers through the use of LinkedIn

Mentor: Kisun Kim

LinkedIn is one of the primary means of communication for job seekers to connect with recruiters and employers. For many users, their LinkedIn profile acts as a digital resume. However, LinkedIn has multiple features that, if curated, can be used as characteristics to build a professional identity. In past research, many scholars have examined the role LinkedIn plays for those hiring. Fewer studies have focused on LinkedIn's influence on job seekers, and the ones that do, don't examine much beyond the profile feature. To address this gap, this study examines how different LinkedIn identity characteristics relate to job seekers' interview outcomes. Through a survey of recent and current job seekers, this study examines the identity-building and presentation habits of job seekers on LinkedIn.

LinkedIn's features, including a user's profile, network (i.e., follower) amount, and feed, can all be considered identity characteristics. These identity characteristics were the independent variables of this study: profile completion, size of network, frequency of commenting, and frequency of posting. To measure for "success," the job seekers were asked about the number of interview requests they had received. Interview requests were used as a behavioral indicator of presentation effectiveness. Based on this framework, the study hypothesized that higher levels of profile completeness and platform activity would be associated with greater numbers of interview requests.

Through surveying roughly 15 Columbus State University graduate students and other recent graduates, this online survey tracked the parts of the profile that were filled in, the size of their network, and the frequency. Descriptive statistics and correlational analyses were used to examine relationships among the variables. Each of these variables, or characteristics, would be aspects that a job seeker could construct their professional identity on LinkedIn. Results indicated that profile completion and network size were positively related to interview requests, while posting and commenting frequency showed weaker associations. The findings suggest that the job seekers who present more complete profiles and maintain larger professional networks may experience greater

success in receiving interview opportunities. Overall, the study suggests that active and detailed LinkedIn engagement may strengthen professional identity and improve self-presentation outcomes for job seekers.

FGP-9 Reese Wimberly

Lift Every Voice: How Media and Generational Communication from Self-Expression for Black Adults Between the Ages of 18-29

Mentor: Kisun Kim

This study examines how generational communication and exposure to Black cultural media stories shape perceptions of self-expression among Black young adults ages 18 to 29. While previous research has examined cultural identity formation and media representation separately, there is limited scholarship on how intergenerational dialogue and culturally meaningful storytelling work together to shape an individual's sense of voice and agency. This research centers on two key influences: the frequency and quality of intergenerational conversations and engagement with Black literature, music, and film that highlight themes of strength, pride, advocacy, and empowerment. Using a quantitative survey approach, participants will reflect on their experiences with generational communication, their exposure to culturally affirming media, and their perceived confidence in speaking up, being heard, and believing their voices hold value. I hypothesize that higher levels of meaningful generational dialogue and stronger engagement with empowering Black media stories will be associated with greater perceived self-expression. Ultimately, this study intends to contribute to communication scholarship by underlining culturally grounded narratives as powerful foundations for empowerment, identity development, and voice among Black young adults.

FGP-10 Ayomiposi Akinyemi, Joseph Belle, Ariel Oden, Sophia Rother, Alexis Sutcliff

Anticipated Effects on Deep Groundwater Flow by Proposed Quarry

Mentor: Troy Keller

Quarries often have negative impacts on surrounding groundwater by excavating the site and dewatering it for mining purposes. A proposed rock quarry within Cusseta, Alabama may negatively impact the local deep groundwater levels in the region. The Cusseta Township seeks to understand the harmful environmental impact the Rocky Glades quarry might have on surrounding farmland and private wells. Cusseta Township seeks to understand how the proposed quarry site will affect the flow of deep groundwater in the surrounding watershed. We hypothesize that the groundwater will shift to flow towards the projected quarry site, which could result in limiting water availability in surrounding wells. By attaining the elevation of water in the deep wells, we can use ArcGIS Pro to create a flow direction map using water level contours. To simulate the impact of the quarry, we will then reanalyze the flow direction after adding a deep well set to the anticipated quarry depth. The pumping well at the center of the quarry negatively affected the flow of deep groundwater within the surrounding watershed, pulling the water away from domestic wells and toward the quarry. The findings of this research suggest that the quarry will impact deep groundwater which will have domestic and economic effects. Future research could use data from analysis of metals

and isotopes to age and source of local groundwater. That data could be used to understand ground and surface water connectivity, which is critical to understanding the hydrology of this region and how it may be impacted by the proposed quarry.

OS1-1 9:00-9:15 Nikhil Saddi

SignalWeave

SignalWeave is a research-driven Security Operations Center (SOC) detection and correlation engine designed to address one of cybersecurity's most pressing challenges: alert fatigue. Traditional security tools often generate alerts for every suspicious event, overwhelming analysts and obscuring real threats. SignalWeave models how modern SOCs operate by ingesting authentication logs, correlating activity over time, and evaluating behavioral patterns before determining whether an incident truly warrants escalation.

Built with a modular architecture using Python and FastAPI, the system normalizes incoming data, detects patterns such as repeated failed logins, and assigns contextual risk levels (Low, Medium, High). By intentionally separating raw events, signals, and incidents, SignalWeave demonstrates how risk-based decision-making reduces false positives while improving threat prioritization. This project serves as both a functional prototype and an educational model of real-world detection engineering, and the presentation will include a live demonstration of its end-to-end workflow.

OS1-2 9:15-9:30 Evan Ahmed, Adam McDonald, Noureldeen Younis

Pop-Up Java: Exploring the Effectiveness of Augmented Reality in Coding Education

Technological literacy is becoming an essential part of K–12 education, especially as students prepare for STEM-related careers. However, introductory programming is often taught in ways that feel abstract and disconnected from real-world outcomes. Traditional text-based coding environments can be difficult for beginners to understand, making it challenging for students to see how their code actually works.

This project explores whether augmented reality (AR) can make programming more intuitive, engaging, and meaningful for novice learners. We developed Pop-Up Java, a Unity-based educational platform that allows students to write code and immediately see the results appear and interact within their physical environment. As students progress through guided challenges, their code is compiled and executed in real time, generating objects that can be visualized, manipulated, and explored in AR space around them. Instead of imagining what their program does, learners can see their logic come to life, reinforcing key concepts through direct visual and spatial feedback. During Tower Day, we will provide a live demonstration of Pop-Up Java, allowing attendees to experience firsthand how code can be transformed into interactive AR elements and how this approach can make early programming education more accessible, engaging, and impactful.

OS1-3 9:30-9:45 Evan Bradshaw, Yosel Rivera, Jeshlymar Vicente Maldonado, Wyatt

Bridges, Isabel Ehrlich

Tree Disease Detection AI

Crops and trees have diseases. These diseases can be detrimental, not only to the individual plants but to a large group or field if not caught and recognized in a reasonable time frame. Farmers need a way to determine what kind of disease, or even if there is a disease, their plants have before it's too late.

AI has been made to handle this, but due to the lack of specialization in the AI, it is not well suited to recognize the plant, let alone recognize the disease. AI needs to be made that's more specialized to handle recognizing certain types of crops and then recognize if the crops are diseased.

Our team will be making a specialized AI to examine images of trees to determine what kind of tree it is, if the tree is diseased in some way, and if so, what kind of disease the tree has. We will select a type of tree to focus on first and specialize the AI to that variety of tree before expanding it to other types to allow a stronger degree of certainty of both the type of tree and the type of disease.

The goal of this project will allow farmers to have a trusted and inexpensive way to diagnose their crops and determine how to handle problematic diseases in their fields. This is an ongoing work, and results will be provided following the conclusion of experiments and tests.

OS1-4 9:45-10:00 Brennan Widner, Landon Alexander, Dajour Johnson

AI RAG Protocol Security

With the rise of artificial intelligence in recent years, discussions about the security of autonomous systems have come to light. Large backend databases are exposed to potential security risks in the name of convenience. Retrieval Augmented Generation, for example, is a powerful tool that may put sensitive information at risk. There must be a concrete solution for securing systems through RAG at the smallest level, which we will attempt to solve.

Retrieval Augmented Generation “chunks” large pieces of information into smaller, more processable sizes. Each chunk is processed separately by an LLM when generating a response. In our solution, we look to assign metadata to each chunk that will assign a security level on a chunk-by-chunk basis. This will open new avenues for user-based information retrieval. The metadata will serve as a security level at the base layer, preventing sensitive data leaks. Knowing that chunking and metadata assignment is entirely possible, we can safely propose a solution.

We propose fitting a tight security layer onto the data itself, to be processed before an answer is generated, will theoretically prevent data leaks and creates the ability to assign security levels on a user basis without reconstructing a knowledge base for each user type.

OS1-5 10:00-10:15 Alexander Wilson, Jacob Tate

Sale Predictor

A problem most people face is figuring out when a sale is going to happen, so they tend to go on the internet to try to find a reputable source or online forum to help them determine this. What our group wants to address is how to more reliably let everyone know when companies are going to go on sale.

We will make and train an Ai model that will predict when a sale possibly happens. Whether it will happen on a holiday, a seasonal sale, or even an anniversary sale, and many more. The bordering impact on our product will help our consumers tell when a sale will be happening soon. And whether they should save their money until the sale or just go and buy it since there won't be a sale anytime soon.

OS1-6 10:15-10:30 Ryan Willis, Nathan Brown, Tristin Davis

Finch Robotic Programming

This project involves us using one Finch robot to remotely control a separate one, which was made and compiled in Java. In order to make something like this happen requires knowledge we learned by participating in our Computer Science 2 class. These particular robots were programmed using Java and BirdBrain's Java Library. To start integrating the remote control feature of this finch, we first had to review the methods that were used previously. we'd look over the first test, followed by the spinner and dance moves. Using the knowledge I have from the previous assignments, then we built a layout of the methods that were needed for remote control. Some methods, however, weren't used previously, so we had to pull up the list of possible methods required in this assignment. With the combination of previous and new knowledge, we were able to construct the code in the hopes it would work, but of course, it didn't work the first two or three times. After a lot of trial and error, we finally managed to make it work, and we did a final test to make sure there weren't any errors we have missed.

OS1-7 10:30-10:45 Janeen Reid, Alessandra Williams, Beth Owenby, KC Reyes *How Age-Based Stereotypes Affect Senior Citizens to Learn AI Technology* Background: This study investigates age-based stereotypes in learning emerging technology. Although previous research has shown that the younger generation catches on better when it comes to learning recent technology, less is known about senior citizens learning the technology. The purpose of this study is to examine the pressure that senior citizens feel to learn about AI technology.

Methods: This study used interviews and surveys. Data was collected from senior citizens. A total of 40 participants and 1 item were included. Key variables included Ai technology, age, and societal pressure. Data was analyzed using surveys from the local senior assisted living facility in Columbus Georgia.

Results: Results showed that seniors feel the need to learn about recent technology, especially AI.

These findings indicate that due to societal pressure, the need to adopt rapidly changing technology is necessary.

Conclusion: This study suggests that senior citizens learn about recent technology due to societal pressure and stability. The findings contribute to past research and findings that older generations are more willing to learn about recent technology, especially AI. Theoretical implications include that they are learning to stay connected with society just as a standard measure, or they might be learning to be able to work.

OS1-8 10:45-11:00 Dwyana Williams

Defying the Odds

In 1993, she walked onto a college campus carrying more than books. She carried public transportation bus schedules instead of car keys, uncertainty instead of a safety net, and a quiet hope that education could become a door where none had been left open. The world did not make it easy for her to stay. Confusion about grades, the weight of poverty, the grind of survival each semester felt less like progress and more like trying to keep her head above water. Eventually, she did what so many strong people are forced to do: she chose work over waiting, survival over dreams. And for 29 years, she showed up. Steady, loyal, working, while a degree sat unfinished in the background like a sentence without a period.

Time passed. Life happened. Health faltered. Responsibilities multiplied. And still, the dream didn't die, it just learned how to wait. In 2008, she tried again. Life said "not yet." So she listened, healed, and kept going. Then in 2023, she wrote a letter, not just to a financial aid office, but to the past version of herself who thought maybe this chapter would never be finished. By then, she wasn't just a student. She was a full-time employee. A caregiver to a mother with dementia. A woman carrying both memory and loss, duty and devotion, exhaustion and resolve. The odds were loud. Time was heavy. But something in her was louder. She came back! Not as someone chasing a second chance, but as someone who earned it.

In 2024 and 2025, her name appeared on the Dean's List. Not as a fluke, not as luck, but as proof. Proof that focus can outgrow fear. Proof that discipline can outpace doubt. Proof that resilience doesn't always look like speed; sometimes it looks like staying. Now, in her final semester, with graduation set for May 13, 2026, she is not crossing a finish line. She is closing a circle that started decades ago on public buses and quiet hope. She is doing it while working full-time. While caring for her mother. While carrying a life that never got lighter, only stronger.

This isn't a story about being perfect. It's a story about being persistent. About returning when it would've been easier to stay gone. About choosing growth in the middle of grief, and purpose in the middle of pressure.

She didn't beat the odds by escaping them.

She beat them by outlasting them.

And that might be the bravest way to win.

OS1-9 11:00-11:15 Aajay Thiruppathi

The Effect of Novel Heterocyclic Compounds on the Growth of Triple Negative Breast Cancer Cells

Triple Negative Breast Cancer (TNBC) is an aggressive subtype of breast cancer characterized by the absence of estrogen receptor (ER), progesterone receptor (PR), and human epidermal growth factor receptor 2 (HER2). Due to the lack of these receptors, treatment options remain limited, and chemotherapy continues to be a primary therapeutic approach despite its cytotoxic effects on normal rapidly dividing cells. Therefore, there is a need to evaluate novel compounds for potential biological activity against TNBC cells. This study investigated the anti-proliferative potential of chemically synthesized heterocyclic compounds in the TNBC cell lines. Specifically, novel spiroheterocycles in which a naphthopyran ring shares C-2 with an isoindolone ring were evaluated. Naphthopyrans and isoindolones are known to display diverse biological activities.

The unique three-dimensional geometry and presence of multiple polar functional groups in these compounds suggested their favorable biological interactions. TNBC cell lines (MDA-MB-231 and MDA-MB-468) were treated with varying concentrations of the heterocyclic compounds dissolved in DMSO. Cellular proliferation was assessed using the MTT assay to determine the compounds' biological activity. Preliminary findings indicate four compounds demonstrate significant anti-proliferative effects, and additional compounds are currently being evaluated.

This research will contribute to understanding the biological activity of these novel heterocyclic compounds in TNBC models.

OS2-1 9:00-9:15 Hannah Simmons

The Effect of Natural Products on the Growth of Docetaxel Resistant Triple Negative Breast Cancer Cells

TNBC is a very aggressive form of breast cancer and there is no targeted treatment available for this subtype of breast cancer. Chemotherapy drugs like docetaxel are prescribed for TNBC patients. Chemotherapy is cytotoxic and has various side effects as it cannot differentiate between normal fast-dividing cells and fast-dividing cancer cells. Docetaxel kills most of the cancer cells, but some cells are resistant to docetaxel. These resistant cells survive, they express cancer stem cell markers and are responsible for the relapse of cancer. In this project, we are studying if the chemicals in natural products like ginger, turmeric, herb (ashwagandha), grapefruit, lemon peel, etc. can kill docetaxel resistant TNBC stem cells. We are working with prominent chemicals in natural products like Withaferin A in ashwagandha, curcumin in turmeric, 10-Gingerol/Shigoals in ginger, etc. We have some preliminary data making use of the online molecular docking tool Patch Dock and we have analyzed the data using a molecular visualization system called Pymol. We have found possible interactions between chemicals in natural products and over-expressed proteins (CD24, KIF 11, KIF14) in docetaxel-resistant cells. We want to check the potential of these natural products to

kill the docetaxel resistant TNBC stem cells. Natural products are well tolerated by the human body, and they will be a great substitute for chemotherapy which is toxic for the human body."

OS2-2 9:15-9:30 Aaliyah Moise

Familial violence and its effects on family structure

This study examines the correlation and effects of different family structures that have been introduced to familial violence. The purpose of this study is to understand how much an entire family can change or approach life when a member of the family has experienced or is displaying violence within the family. In this generation it's become a big goal to end the generational trauma that they may have been subjected to but do not want to continue. For so many people to feel the need to stop this; then we should understand how much something like familial violence can affect the family structure. I conducted mixed method research with some literary reviews. Data was collected from reliable sources including government websites and an interview with members of a family that experienced family violence was performed. The intention of this research is not to simply talk about "ending generational trauma" but to create an understanding on how much of an effect that trauma has on a family and how the generations to follow can be affected by it too. This understanding will hopefully invoke a sense of reflection in all observers to think about at least one habit from a previous generation that they think can have a better alternative for those to come after.

Keywords: Family violence, domestic violence, family structure, family dynamics, generational trauma, Breaking familial cycles, adverse childhood experiences (ACEs), cycle of violence.

OS2-3 9:30-9:45 Myriam Thiam

Targeted Intervention Strategies for Androgen Independent Prostate Cancer (AIPC): A Natural Product Approach

Androgen-Independent Prostate Cancer (AIPC) is a serious and aggressive form of prostate cancer that does not respond to standard hormone therapies. Because of this, there is a strong need to find new and effective treatment options. Our research focuses on exploring the potential of Artemisia absinthium (commonly known as Wormwood) as a natural source of anti-cancer agents for AIPC. We have extracted and screened bioactive compounds from A. absinthium and evaluated their effects on AIPC cell growth through in vitro assays. Our results show that both the crude extract and several fractions significantly reduced cancer cell growth. We also used bioinformatics tools and found that some plant compounds interact with important cancer-related markers. These findings suggest that A. absinthium could be a promising natural option for developing new treatment for aggressive prostate cancer.

OS2-4 9:45-10:00 Emily Crews, Mackenzie Phipps

The Effects of Secondary Metabolites Extracted from Eupatorium serotinum on the Growth of Androgen-Independent Prostate Cancer Cells

Androgen-independent prostate cancer (AIPC) is an aggressive stage of prostate cancer that does

not require the presence of hormones for its progression. Most prostate cancers develop as androgen-dependent cancers, which are treated with androgen deprivation therapy. Androgen-dependent prostate cancer has the capabilities to develop into androgen-independent prostate cancer, meaning hormone depletion therapy will no longer work as a treatment plan. Current treatment plans for AIPC are limited and low in efficacy, creating a need for useful and effective strategies for treatment that will induce cell death and prevent relapse. Researchers have been investigating secondary metabolites produced from natural sources for their potential as anti-cancer agents. Secondary metabolites are organic compounds that plants produce to increase their chances of survival and reproduction in their environment. These compounds have produced positive results in research due to their ability to be biologically active in humans, their low toxicities, and their physico-chemical properties. In this project, chromatographically separated fractions containing secondary metabolites from the North American native plant Eupatorium serotinum, common name late boneset, are used against androgen-independent prostate cancer cell lines DU-145 and PC3. Cell lines DU-145 and PC3 are treated with fractions for 72 hours and their cell growth is evaluated using the MTT assay.

Multiple fractions have exhibited antiproliferative potential against both cell lines. Further research will be performed to confirm the ability of secondary metabolites from E. serotinum to reduce cell viability in AIPC cell lines DU-145 and PC3. This study provides insight into the capabilities for secondary metabolites from E. serotinum to work as an effective, plant-based treatment for androgen-independent prostate cancer.

OS2-5 10:00 -10:15 Venkat Garlapaty

The Effect of Natural Products on The Growth of Docetaxel-Resistant Androgen Independent Prostate Cancer Cells Expressing Cancer Stem Cell Markers

Androgen-independent prostate cancer (AIPC) is an advanced and aggressive stage of prostate cancer that no longer responds to hormone-depletion therapy. The current standard of care for AIPC is the FDA-approved chemotherapy drug docetaxel, which initially provides clinical benefit but ultimately fails as resistance develops. Docetaxel-resistant prostate cancer cells often express cancer stem cell markers, such as CD44, representing a population of cells that are highly resistant to chemotherapy and radiation and are responsible for cancer recurrence. There is an urgent need to identify alternative therapeutic strategies to target this drug-resistant cell population. In this project, the anti-proliferative potential of natural products—including turmeric, ginger, and ashwagandha is being evaluated in docetaxel-resistant prostate cancer stem cells. Briefly, prostate cancer cells (PC3 and DU145) were cultured and gradually exposed to increasing concentrations of docetaxel to generate docetaxel-resistant cell lines. These resistant cells were treated with varying concentrations of the natural products, and cell viability was assessed using the MTT assay. We have examined the effects of natural products such as curcumin (turmeric), Withaferin A (Ashwagandha), and gingerol (ginger) on both regular and resistant cell lines, in the presence and absence of docetaxel. In both cell lines, PC3 and DU 145, that were made resistant to docetaxel, almost all natural products were more effective in killing docetaxel-resistant cells, and docetaxel

was more effective in regular cell lines, as expected. This research has the potential to reveal novel strategies for overcoming docetaxel resistance and contribute to the development of more effective treatments for advanced prostate cancer.

OS2-6 10:15 -10:30 Trinity Washington

Developing an Eco-Friendly Rust Remover: Testing Citric-Citrate Solutions with Natural Inhibitors

The oxidation of iron and steel is a universal problem that typically requires the use of hazardous synthetic acids for cleaning and maintenance. This research focuses on the development of a safer, "green" alternative: a homemade citric-citrate rust removal solution. The primary goal of the study is to test the base effectiveness of this solution and determine if adding organic, biodegradable inhibitors—specifically eucalyptus and citrus peel extracts—improves its performance. The experiment seeks to discover if these natural additives can either increase the speed of rust removal or act as a protective barrier to prevent new rust from forming. To maintain a rigorous scientific process and limit experimental variables, the study uses 16-gauge cold-rolled steel. Two large plates, originally 8 by 24 inches, were cut into uniform 2 by 4-inch samples to ensure that every test is conducted on a consistent surface area. These samples are intentionally rusted under controlled conditions to provide a standardized starting point for all trials. The core of the data collection relies on a mass-loss method; each sample is weighed while rusted, treated with a specific solution, and then weighed again after cleaning. This weight difference provides a clear, mathematical measurement of how much rust was removed and whether the solution protected the healthy metal underneath. Beyond simple cleaning, the research explores the concept of long-term inhibition. After the initial cleaning, the steel samples are re-exposed to a corrosive environment to see which natural extract best defends the metal against future damage. The chemistry behind this involves looking at how the organic compounds in the extracts, such as natural oils and acids, interact with the metal surface to create a molecular shield. This study identifies a specific mixture that balances fast cleaning with strong future protection. This research is important because it moves away from toxic, industrial chemicals and toward "green chemistry" solutions that are easy to produce and safe to handle. By utilizing common biodegradable materials like citrus and eucalyptus, the study proves that environmentally friendly products can be just as effective as traditional ones. This approach provides a practical, low-cost model for metal preservation that is accessible to both home users and small-scale operations. The findings detail the experimental design, the results of the mass-loss tests, and a comparison of which organic inhibitor offered the best overall performance for rust remediation and prevention. By validating these natural alternatives, the research offers a comprehensive framework for sustainable metal treatment that reduces environmental impact while maintaining high efficiency.

OS2-7 10:30 -10:45 Nevaeh Norwood, Tamia Mcghee, Ashlee Thomas

The Long-Term Impact of Child Abuse on Development and Mental Health

Child abuse is a serious social and public health problem that affects children's safety, emotional well-being, and long-term development. This paper examines how physical abuse, emotional abuse,

and neglect affect children's learning, mental health, and relationships over time. The main problem addressed in this research is how early trauma can shape a child's development and create challenges that continue into adolescence and even adulthood. Many children who experience abuse face difficulties that go beyond immediate harm. These difficulties can include trouble in school, problems managing emotions, and challenges forming healthy relationships. Understanding these effects is important for improving prevention efforts and providing better support for affected children.

To explore this issue, this paper reviews information from academic studies and research articles focused on childhood trauma and development. The method used is a review of existing research to identify common findings about how abuse impacts children over time. The sources were selected based on their focus on brain development, emotional health, behavior, and recovery. By comparing results across multiple studies, this paper identifies patterns in how abuse affects growth and which factors help reduce long-term harm.

The key findings show that physical abuse is often linked to high levels of stress that can interfere with brain development. Long-term stress may affect memory, attention, and emotional control, which can lead to academic struggles and behavior problems in school. Emotional abuse has been connected to increased risks of anxiety, depression, and low self-esteem. Children who experience emotional harm may have difficulty trusting others and building stable relationships. Neglect is commonly associated with delays in language skills, social development, and emotional growth because children may not receive consistent care, attention, or support. Research also connects early trauma to higher risks of mental health challenges and ongoing difficulties in school performance and peer relationships. However, the findings also show that negative outcomes are not guaranteed.

The research highlights the importance of protective factors. Supportive relationships with caring adults, stable and safe home environments, access to counseling, and early intervention programs can greatly reduce the long-term effects of abuse. Children who receive consistent support are more likely to develop healthy coping skills and improve their emotional and academic functioning.

In conclusion, child abuse can have lasting effects on a child's brain, behavior, learning, and relationships. However, early support and strong community involvement can promote healing and positive development. Prevention efforts and access to mental health services are essential for improving long-term outcomes for children who have experienced abuse.

OS2-8 10:45-11:00 Elijah Starkey, Feshuna Calloway, Grace McMillen, Natalee Clawson, Ayden Knighton, Sanaa Mitchell, Jamie Neal, Matthew Petallar, Amy Taylor, Robert Gill
The JT48 Project – Columbus College in the Civil Rights Era
During this presentation, we will explore how the city of Columbus and Columbus College evolved

during the 1960 Civil Rights era. A pivotal moment in the Post World War II Civil Rights movement was Executive Order 9981 by President Truman in 1958 which integrated Fort Benning and all of the Armed Forces. This integration mandate was 15 years before Columbus College became integrated through the matriculation of John Townsend, the first African American student to attend Columbus College. Once Townsend graduated, Columbus College rapidly changed, with transformations occurring across the full spectrum of the lives of all of the students. Using sources like early yearbooks, past issues of our student newspaper, and texts exploring the history of Columbus and Fort Benning from the 1950s through the 1970s, our sources revealed a variety of responses to the Civil Rights movement, with these responses signaling how the university was evolving. Although we in the preliminary stages of our research, we have come to see that an exploration of the early history of CSU cannot be adequately understood without an understanding of the Civil Rights era. We've also learned that all students of all majors can become memory keepers.

OS3-1 1:00-1:15 Grissel Alexa Sala

Law Enforcement and Protest

The research examines the constitutional right, the First Amendment, specifically the right to assembly. It investigates the relationship between law enforcement presence and variations in protest behaviors. The central research question is whether law enforcement presence during peaceful protests is associated with differences in protester behavior and protest outcomes.

The geographic focus of this study is Minnesota, with particular attention to law enforcement presence and protest escalations within the state. Escalation is defined as measurable increases in arrests, documented confrontations, or use-of-force incidents during protests that begin peacefully. Protest escalation will be the dependent variable, while law enforcement tactical posture will be the independent variable. Crowd demographics, including age, race, socioeconomic status, and education levels, as well as protest issue type, will be incorporated as control variables. The project will be a mix of methodologies. This research contributes to scholarly understanding of interactions between protesters and law enforcement during constitutionally protected assemblies.

OS3-2 1:15-1:30 Axel Jones

Why Prince Hamlet Would Hate Shakespeare (Or, A Commentary On This Generation's Approach to Classical Literature)

Hamlet is one of the most famous existentialist works in classic literature. Debated and studied for nearly as long as it has existed, this tragedy is both integrated into modern society and culture while also having a reputation for being "high art" and difficult to understand. Shakespearean works tend to be held at arm's length by the average American student for fear of the language; however, there has been a recent resurgence of Shakespeare's characters in social media forums and youth culture in the form of text posts and memes. Generation "X" and millennials have a humor-based existential lens of many aspects of life. Particularly, there is a common view of Hamlet

as a depressed teenager in the emo subculture among high school students, hence the title of the pitch. Whether referring to modern fads or historical literature, societal stigmas dictate the public opinion on nearly anything. For instance, the cultural phenomena of "scene" and "emo" subcultures that dominated the early 2000s (where the band My Chemical Romance thrived) are now broadly considered "cringe" and outdated. Disregarding a view as obsolete or out of fashion, however, can be lethal to the growth of a generation's culture.

OS3-3 1:30-1:45 Christin Warren

Public Sentiment and MASH in the Final Years of The Vietnam War

From its earliest seasons, the comedy-drama sitcom M*A*S*H maintained a steadfast anti-war commentary, which served as a pertinent response to the mounting public disillusionment surrounding the Vietnam War. Despite the show being set during the Korean War, it is generally understood that the series was topical commentary on the then ongoing conflict within Vietnam. Many of the show's recurring themes and plot lines culminated together to form the series' overarching message that illustrated the meaningless nature of warfare. M*A*S*H emphasizes how social commentary in fictional works plays a crucial role in reconciling national tragedy.

OS3-4 1:45-2:00 W. Brock Smith

American Judgment on Calley's Conviction: How Southerners Related Calley's Conviction to the Vietnam War

On March 16th, 1968, members of the United States Army brutally murdered 504 women, children, and elderly in the Vietnamese village of My Lai 4. On March 31st, 1971, Lieutenant William Calley was sentenced for the murder of twenty-two civilians, making him the only person held responsible for this horrific incident. Reactions to the conviction of Calley vary, but one set of reactions that deserves special attention are those that occurred in Columbus, Georgia and Georgia's 3rd Congressional district where his trial took take place. After the verdict was announced, constituent letters commenting on the trial poured into the office of Jack Brinkley, the district's Congressman. The outpouring of support for Calley is undeniable, but the reasons that so many people supported Calley vary and were never as simple as unwavering Cold War patriotism. One veteran wrote, "From a veteran wearing winged boot, guilty of civilian deaths. Cest La Guerre. Free Calley or try us all." Another stated that, "You know when you get a little older, things like this upset you more. I have a grandson and if I could I think I would tear up his draft card. They aren't thinking about all of our boys who have been killed over there." These two letters, while both pronouncing their support for Calley, highlight the wide range of responses that Georgian's had to the massacre and, more broadly, the Vietnam War. Their feelings about Calley's conviction vary from complacent acknowledgements of the murders to fear that her grandchild could face similar punishment. By looking at letters from constituents to their congressman, we learn a great deal about the anger and frustration southerners felt towards Calley's conviction, and this paper will analyze the complicated emotions people had with the Vietnam war.

OS3-5 2:00-2:15 Gavin Tate

Blending the Divine: Religious Complexity in the Achaemenid Empire

This study examines the religious identity of the early Achaemenid Empire through an analysis of Cyrus II and Darius I, arguing that their reigns reflect a complex process of religious integration best described as Proto-Zoroastrian rather than definitively Zoroastrian. Situating the discussion within the broader context of early Iranian history, the paper traces the migration of Indo-Iranian peoples into the Iranian plateau and the emergence of the Medes and Persians, whose political consolidation culminated in the formation of the Achaemenid Empire in the sixth century BCE. Particular attention is given to the fluid and developmental nature of Zoroastrianism, whose chronology, textual canonization, and doctrinal evolution complicate attempts to categorize early Achaemenid rulers within a fixed religious framework.

The paper engages the historiographical debate surrounding Achaemenid religion. Earlier scholarship, especially that of Mary Boyce, argued that the Achaemenid kings were clearly Zoroastrian. Later scholars such as Prods Oktor Skjærvø have contended that while Zoroastrian elements are evident, the evidence does not justify labeling the rulers definitively as adherents of a fully developed Zoroastrian orthodoxy. Avram R. Shannon's concept of "Proto-Zoroastrianism" provides a mediating framework, suggesting that early Achaemenid religious ideology incorporated emerging Zoroastrian concepts without constituting a formalized or exclusive Zoroastrian identity. This paper builds upon and refines that mediating position by incorporating evidence often overlooked in the debate, particularly the role of Cyrus II and the influence of external religious traditions such as Judaism and Mesopotamian cults.

Using the Cyrus Cylinder, the Book of Isaiah, the Old Avesta, the Gāthā-Bā-Maāni, and the Bisotun Inscription, this study analyzes how royal ideology intersected with developing theological concepts. The Cyrus Cylinder portrays Cyrus II as divinely chosen by Marduk to restore order in Babylon, while the Book of Isaiah similarly presents him as the anointed agent of the Judean God, tasked with liberating the Jewish people and restoring the Temple in Jerusalem. The linguistic and thematic parallels between these sources—particularly motifs of divine election, temple restoration, and shepherd imagery—demonstrate Cyrus's deliberate engagement with multiple religious frameworks. Rather than indicating personal adherence to a single doctrinal system, these parallels reveal a strategic sacral kingship model that integrated local religious traditions into imperial ideology.

At the same time, Cyrus's emphasis on justice, legitimacy, and restoration resonates with emerging Zoroastrian dualism, especially the moral polarity between truth (asha) and the lie (druj). These themes become more explicit under Darius I, whose Bisotun Inscription invokes Ahura Mazdā directly and frames his suppression of rebellions as the defeat of the Lie. Darius's rhetoric aligns closely with Zoroastrian cosmology, portraying political insurrection as moral and metaphysical disorder. His repeated insistence that his authority derives from Ahura Mazdā and his condemnation

of rivals as liars indicate a more explicit articulation of dualistic ideology within royal discourse.

Nevertheless, the evidence does not conclusively demonstrate adherence to a fully systematized Zoroastrian orthodoxy. Instead, the Achaemenid rulers appear to have operated within a dynamic religious environment in which Iranian dualistic concepts, Mesopotamian traditions, and Jewish theological ideas interacted. Cyrus's presentation as a divinely sanction.

OS3-6 2:15-2:30 Daniel Callies

POST-Certified De-Escalation Training: Does It Affect Use of Force in Georgia Law Enforcement?

"While many modern police agencies are still working to minimize the application of lethal force and maximize positive community contacts, de-escalation is a key part of that strategy. The Georgia Peace Officer Standards and Training (POST) Council has designed specific training modules, such as "De-Escalation for Officers," to address that goal. Yet there is a dearth of literature on the effect of that training on the frequency and extent of use-of-force by Georgia enforcement officers. This study will assess whether the de-escalation training being provided at the Georgia Public Safety Training Center (GPSTC) is effective in preparing officers to de-escalate. This research is pertinent because it will shape future training and policy at the GPSTC. The mixed-methods research design will comprise a qualitative document analysis of de-escalation course materials and a quantitative analysis of extant use-of-force data from participating Georgia law enforcement agencies. Through incident and training data analysis from 2023 to 2025, this study will determine whether a significant reduction in physical enforcement actions has occurred amongst officers who have received advanced de-escalation training. training.

OS3-7 2:30-2:45 Zoe Milano

Child Abuse leading to Addictions in Juveniles: The Lasting Impacts

Child maltreatment and neglect are strongly linked to later substance abuse and contribute to an intergenerational cycle of harm. Research consistently shows that individuals who experience abuse in childhood are more likely to engage in substance use during adolescence and adulthood as a means of coping with trauma. In Georgia, nearly 40% of children removed by Child Protective Services have cases involving caregiver substance abuse, underscoring the scope of this issue. This oral presentation reviews existing literature on the relationship between child maltreatment and substance abuse, with a particular focus on juveniles in foster care and the systems designed to protect and support them. Using a literature review approach, the analysis examines trauma-informed practices, early intervention strategies, and the roles of social workers, guardians ad litem, and foster parents in recognizing and addressing substance use among youth. Findings suggest that early identification and targeted, trauma-responsive interventions may help disrupt cycles of maltreatment, decrease future system involvement, and improve long-term outcomes for affected children and adolescents.

OS3-8 2:45-3:00 Rachel Turner

Drivers of Road Rage: A Social Phenomenon

The social phenomenon of "road rage" is unique as it is an extremely common occurrence closely tied to psychological processes and behaviors that have immediate real-world consequences. Despite the frequency of life-threatening accidents caused by this phenomenon, little has been done to address the combination of psychological and social factors regarding road safety. First recognized in the 1980s, road rage is a social issue linked directly to road stimuli. Observable behaviors associated with road rage include yelling, speeding, following too closely, hand gestures, and shootings. The catalyst for these behaviors is believed to be multifactorial, including factors such as stress, external stimuli, and personal anonymity. Road rage has been linked to intermittent explosive disorder as well as state-trait anxiety, certain coping styles, and self-determination theory. Through the philosophical framework of pragmatism, Herbert Mead's social behaviorism, W.I. Thomas's theory on the relationship between thoughts and behaviors, and Herbert Blumer's emphasis on meaning to understand human actions, we can better understand how these factors culminate to create this phenomenon. Only a thorough understanding of how these behaviors develop can properly address this social issue.

ART1-1 9:30am- 9:50am

Michelle Laverne Bossier

The Elephant in My Living Room

The Elephant in My Living Room is a mixed-media work that confronts the unspoken histories embedded in American identity, those truths that are present, overwhelming, and often deliberately ignored. The central figure of a camouflaged African elephant emerges within the domestic space as both witness and warning, symbolizing the persistent legacy of slavery, colonization, and racialized labor that continues to occupy contemporary life. The elephant's patterned surface functions as a visual disruption, blending into familiar imagery while refusing invisibility, much like the histories it represents.

Through layered materials including burlap, house paint, oil, acrylic, charcoal, and found elements, the work physically embodies the weight of inherited trauma. Burlap evokes agricultural labor, trade, and the commodification of human bodies, while fragments such as cotton, tobacco leaves, and diagrammatic references to African slave ships anchor the piece in economic systems built on exploitation. Partial figuresNative American profile and feather, fragmented European aristocratic limbs, and the lower extremities of enslaved Africans and early settlers—are intentionally incomplete, emphasizing erasure, hierarchy, and the dismemberment of collective memory.

The American flag, rendered as both symbol and burden, hovers within the composition as a contested emblem of freedom and contradiction. Its presence challenges viewers to reconcile national mythology with lived realities, asking who has historically been included in its promise and who has paid the cost. The center seal, surrounded by organic materials, suggests authority and

legitimacy, yet its placement amid fractured bodies questions the foundations upon which such authority rests.

This work does not seek to accuse in isolation, but rather to expose complicity through proximity. By situating the elephant in a "living room," the piece collapses the distance between historical violence and modern comfort, insisting that these narratives are not confined to textbooks or museums but reside within everyday spaces and personal identities. The domestic setting becomes a site of reckoning, where silence is no longer neutral.

Ultimately, The Elephant in My Living Room invites viewers into a moment of confrontation and reflection. It challenges them to acknowledge inherited histories, sit with discomfort, and recognize that healing and accountability begin only when the elephant is no longer ignored.

PD1- "Success Post Undergraduate: Fellowship and Professional Development" 9:30-10:00am – Room: 312/313

Joshua May, National Scholarship Committee

The National Scholarship Committee at Columbus State University will present an overview of our scholarship opportunities for students and faculty. CSU students are encouraged to apply for and participate in these national competitions. Students are encouraged to begin planning for these opportunities as early as their freshman year so that they can participate in activities that will increase their competitive edge in these prestigious national competitions.

These scholarships are designed to attract outstanding students across many different disciplines. A consortium of faculty across campus will review applications and make recommendations. Faculty and students can learn more about these scholarships in this session, meet our committee members, and can view the requirements to apply for them visiting our website at National Scholarship Opportunities - Columbus State University.

PD1-2 "Exploring Careers in Higher Education Administration" 10:45 am- 11:15 am - Room: 312/313

Jennifer Lovelace, Director of the Doctoral Program
Melissa Young, Assistant Vice President for Student Success Michael Poll, Adjunct Instructor, Higher Ed. Admin.

As colleges and universities continue to evolve in response to shifting student needs, technological advancements, and changing educational landscapes, the field of Higher Education Administration

offers dynamic and meaningful career opportunities. This session introduces undergraduate students to the diverse professional pathways available within student affairs and higher education administration, highlighting roles that are essential to supporting student success, strengthening institutional effectiveness, and shaping campus life. Participants will gain an understanding of key functional areas – including academic advising, student engagement, housing and residence life, admissions, diversity and inclusion, and institutional leadership – while exploring how graduate study provides the knowledge, skills, and professional experiences necessary for entering the field. Through real-world examples, discussion of emerging trends, and guidance on choosing a master's program, this session aims to equip aspiring higher education professionals with the insight needed to take the next step toward a purposeful and impactful career.

GFO 1-1 9:30am- 9:45 am

Jennifer Lovelace

Beyond calling: What keeps us going when the going gets tough

In times of burnout, disillusionment, or systemic challenge, the concept of "calling" often serves as a foundational motivator for educators, leaders, and change agents. But what happens when calling alone isn't' enough? This session explores the deeper, often overlooked sources of resilience and perseverance that sustain professionals through adversity. Drawing on qualitative insights from doctoral students, faculty, and higher education leaders, this presentation will unpack the emotional, relational, and structural supports that help individuals persist when their sense of purpose is tested.

Participants will engage with reflective prompts and storytelling exercises to identify their own sustaining forces – whether it be community, mentorship, spiritual grounding, or a commitment to justice. The session will also introduce a framework for "resilience beyond calling," offering practical strategies for cultivating long-term sustainability in mission-drive work. Attendees will leave with renewed clarity about what keeps them going and how to nurture those sources intentionally in themselves and others.

GFO 1-2 9:45am- 10:00am

Lee McVadon

Using neurofeedback as a treatment modality for post-traumatic stress disorder

One of the defining characteristics associated with post-traumatic stress disorder (PTSD) involves dysregulation of several brain wave frequencies, with notable changes in alpha and beta activity. Decreased alpha power has been associated with reduced sensory suppression and increased hyperarousal. In contrast, increased beta power has been linked to heightened vigilance, impaired focus, and activation of the fight-or-flight response. Additionally, alterations in alpha wave frequency have been associated with persistent sympathetic activation. Neurofeedback is a technique rooted in operant conditioning that aims to train dysregulated brain waves to return toward a more regulated state of neural activity. Through noninvasive measures, this approach

allows individuals to moderate neural activity using real-time feedback. This presentation highlights a range of studies examining the potential benefits of neurofeedback as a treatment modality for PTSD.

GFO 1-3 10:00 am- 10:15 am

Rahmatullah Roche, Sumit Tarafder, Debswapna Bhattacharya

ProRNA3D-single: A Deep-Learning Powered Protein-RNA 3D Structure Prediction Method

Determining how protein–nucleic acid complexes interact and adopt conformations in three-dimensional space is crucial for understanding biological processes and holds great potential for drug design and discovery. However, experimental determination through wet-lab methods is expensive and time-consuming, making computational prediction an attractive alternative.

Although recent deep learning techniques have shown strong predictive potential, they often rely on limited evolutionary information. To address this limitation, we developed ProRNA3D-single, a method for predicting the 3D structure of protein–RNA complexes. ProRNA3D-single introduces a geometric attention–based pairing strategy that integrates language model embeddings for proteins and RNAs, thereby bypassing the constraints of evolutionary data and enabling more accurate predictions. The ProRNA3D-single method was published in Cell Systems, demonstrating its potential for broad application and dissemination.

GFO 1-4 10:15 am- 10:30am

Rahul Raj, Luka Wilmink, Morgan Brown, Chandler Carabajal

Zero Trust for Non-Terrestrial Systems

Cyber threats in the Non-Terrestrial Network (NTN) environment have shown that traditional perimeter-based security models are insufficient for specialized missions. NTNs are a critical service to enable global connectivity and are exceptional targets for nation-state cyber actors. To meet proper network security posture, we are collaborating with INSuRE Research to integrate the Zero Trust framework. Our investigation focuses on identifying gaps in existing protocols and overviewing the emerging Low Earth Orbit (LEO) NTN, CubeSats. In our study, we have accumulated literature reviews of essential protocols within space communications, CubeSats architecture, and case studies of successfully launched CubeSats.

GFO 1-5 10:30am- 10:45 am

Eric Spears

Spatial Practices of Power: (Re)Producing São Paulo Across Regime

This research examines the intersection of place, memory, and neoliberal transformation in São Paulo, focusing on how the city's spatial fabric reflects both the authoritarian legacy of Brazil's military dictatorship (1964–1985) and the subsequent restructuring under neoliberal urbanism through the present day. Drawing on geographic and political economy theory, as well as on historical spatial practice, the analysis situates São Paulo as a contested site where the production of space during the dictatorship, through securitized campuses, repressive policing of public

squares, and infrastructural megaprojects, both constrained and enabled new urban imaginaries. The study then considers how neoliberal reforms, privatization, and entrepreneurial urban governance have reshaped the landscape, often erasing or commodifying spaces of memory tied to student resistance, labor organizing, and state violence. By juxtaposing sites of repression, such as university precincts, detention centers, and protest squares, with contemporary spaces of capital accumulation and memorialization, the research highlights the uneven ways memory is inscribed onto the urban environment. Methodologically, this project combines archival work, field observation, and critical spatial analysis to interrogate how historical geographies of authoritarian control persist within, and are transformed by, São Paulo's neoliberal spatial logics. The paper argues that attending to place and memory within São Paulo's neoliberal present not only illuminates the city's fractured histories but also reveals the enduring power of spatial practices in shaping collective remembrance and forgetting.

GFO 1-6 10:45 am- 11:00 am

Alejandro Villasana

The Generous Inquiry Protocol: Neutralizing the "It's Not For Me" Syndrome in Secondary STEM Education

A significant barrier to achieving equity in secondary Computer Science (CS) and Math education is the "It's Not For Me" syndrome. This phenomenon reflects a form of academic withdrawal where students, particularly those from underrepresented backgrounds, perceive the effort required to master STEM subjects as a Calculus of Sacrifice that threatens their cultural identity.

This presentation will discuss a three-year longitudinal study conducted at Norcross High School that tested an original philosophical framework, the Generous Inquiry Ideology (GII). By integrating the GII Protocol—a teaching approach that reframes technical learning as an act of communal service rather than a pursuit of personal gain—the researcher observed a significant improvement in student outcomes. Quantitative data indicate a reduction in course failure rates, dropping from 24% in 2022 to 9% in 2025. The session will outline the theoretical foundations of GII, which combines Socratic rigor with Pascalian delight, present comparative data, and provide educators with GII strategies that can be incorporated into existing rigorous curricula to cultivate students' resilient intrinsic motivation.

GFO 2-1 1:00 pm- 1:15 pm

Mohammad Jafari

Closed-Loop Regulation of Cell Migration: Integrating Neural Network Control and Bioelectronic Stimulation

Cell migration is a tightly regulated biological process that plays a central role in tissue development, immune response, and wound repair. External electric fields (EFs) have been widely used to modulate migratory behavior and enhance tissue regeneration; however, cellular responses to EFs are nonlinear, stochastic, and constrained by safety limits on stimulation intensity. These

characteristics hinder precise, real-time control of migration dynamics.

In our recent work published in Bioengineering, entitled "Controlling Cell Migratory Patterns Under an Electric Field Regulated by a Neural Network-Based Feedback Controller", we propose a closed-loop bioelectronic framework that integrates EF stimulation with a neural network (NN)-based feedback controller to achieve accurate regulation of cell migration. Building on a previously developed NN controller for membrane-potential regulation, we reformulate the architecture to guide population-level migratory trajectories. To address actuator saturation imposed by EF safety constraints, we incorporate a projection operator into the NN weight-update law, preventing maladaptive learning during signal saturation.

Numerical simulations demonstrate improved trajectory tracking and robustness compared to the original NN design. We further validate the approach experimentally by implementing the controller in vitro to direct the electrotactic migration of naïve macrophages in two-dimensional culture under a unidirectional EF. Performance is benchmarked against a conventional proportional–integral–derivative (PID) controller, highlighting the advantages of adaptive, learning-based bioelectronic control. This work advances the integration of machine learning and bioelectronics for closed-loop regulation of complex cellular behaviors, with potential applications in regenerative medicine and precision bioelectronic therapies.

GFO 2-2 1:15 pm- 1:30 pm

Subhas Mukherjee

Disrupting CDK5-Mediated MCL1 Stabilization to Sensitize Glioblastoma to Radiation

Glioblastoma (GBM) is the most aggressive primary brain tumor and remains largely incurable due to its high recurrence rate and resistance to therapy. Glioma stem cells (GSCs) play a central role in treatment failure by maintaining tumor growth and promoting resistance to radiation therapy. Recent studies suggest that Cyclin-Dependent Kinase 5 (CDK5) contributes to GSC survival and therapeutic resistance, but the underlying mechanisms remain poorly understood. This study investigates the role of the CDK5–MCL1 signaling axis in regulating radiation resistance in GSCs. Our preliminary findings indicate that CDK5 promotes phosphorylation of the anti-apoptotic protein MCL1, stabilizing the protein and enhancing pro-survival signaling. Inhibition of CDK5 reduces MCL1 phosphorylation, accelerates its degradation, and significantly increases the sensitivity of GSCs to radiation treatment. To translate these findings therapeutically, we are developing and testing novel small-molecule inhibitors targeting CDK5. Structure-based virtual screening and biochemical assays have identified several promising CDK5 inhibitor scaffolds with potent activity. Together, this work aims to define the molecular mechanism of CDK5-mediated radiation resistance and establish CDK5 as a promising therapeutic target to improve treatment outcomes in glioblastoma.

GFO 2-3 1:30 pm- 1:45 pm

Kayla Winston-Bass

Short-Form Content on Attention Span in the Classroom

The use of social media is continuously growing every day and has now become thoroughly integrated into the education system, this has both benefits and negatives. However, researchers are now questioning the effects of short-form social media use in the classroom on the attention span and academic performance. Based on a number of already completed studies, when students consume copious amounts of short-form content, it negatively impacts their attention span and engagement in the classroom, leading to educators to reevaluate how they present course material. In my study, I aim to examine when students consume copious amounts of TikTok, it can lead to the decline of attention span in the classroom. My research results will be based off a survey completed by higher education students at Columbus State University. To ensure the collected data portrays accurate and sufficient results, I hope to survey 1st year to graduate students, as well as ensuring the results include students from popular degree programs.

GFO 2-4 1:45pm - 2:00 pm

Nigel McEachern

The Link between Legacy media & Digital Media

My study is rooted in the principles of Media Richness Theory and Gratifications Theory. Media Richness Theory documents that differing channels of communication have different capacities to convey information and create shared understanding. A legacy medium like NASCAR and television ads convey singular messages through live demonstrations. This study offers that the change from legacy media to digital social media and the lack of brand domination in this new respective marketing space has changed the brand perception.