High-PURCS

April 14, 2026

HIGH POINT UNIVERSITY RESEARCH AND CREATIVITY SYMPOSIUM

URCW

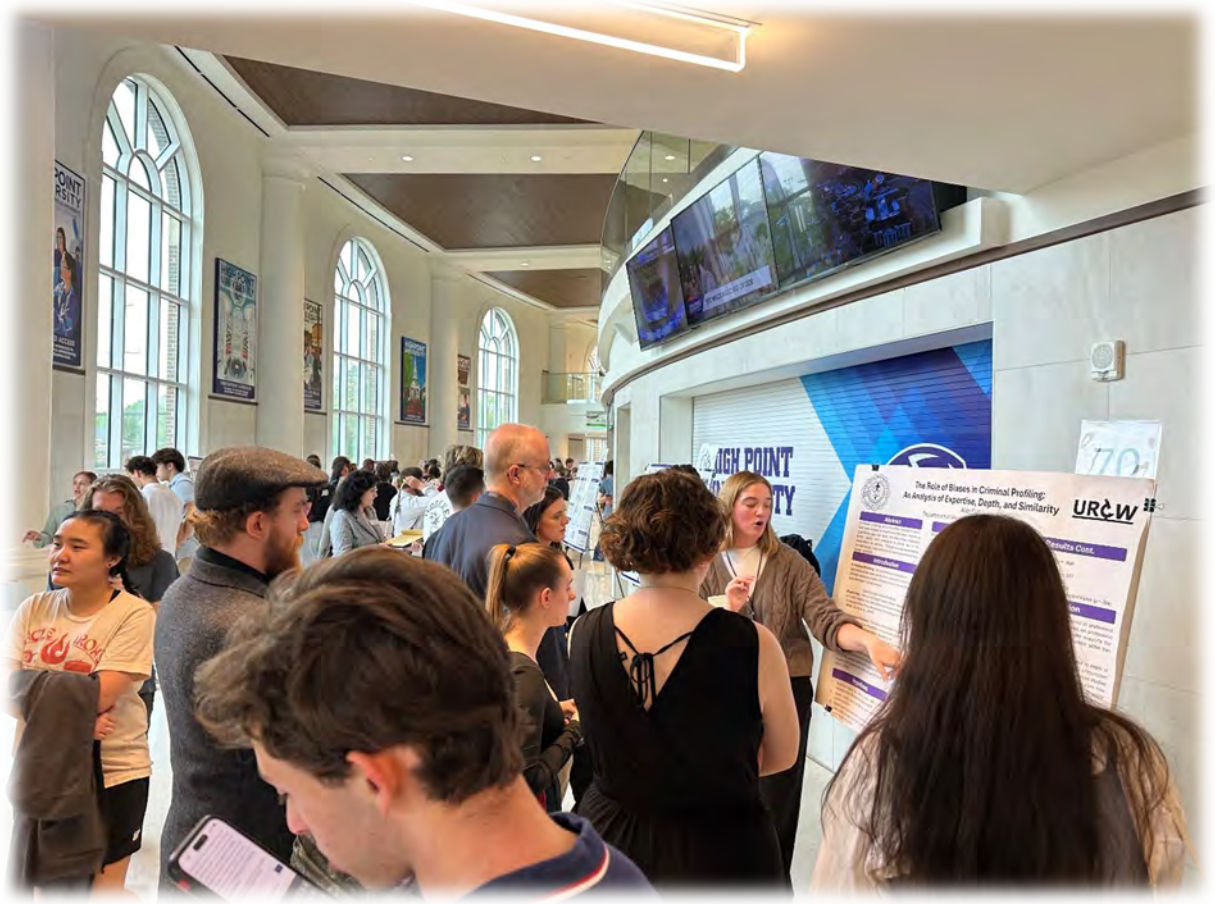
High Point University

The Premier Life Skills University®

Director of Undergraduate Research and Creative Works

Welcome to the 14th High Point University Research and Creativity Symposium (High-PURCS). High Point University is an institution that fosters intellectual and creative scholarship through student engagement and student-faculty collaboration. Our students undertake significant work in intellectual and creative endeavors mentored by faculty; they regularly share their work at professional, national, and regional conferences. High-PURCS is an opportunity for students to showcase their projects on campus so HPU students, faculty, and staff can witness our students' professional development and gain a glimpse of tomorrow's future leaders, artists, scientists, teachers, and scholars. At this year's symposium, we have 259 projects from 410 undergraduate students mentored by 88 faculty from 40 different fields across most of High Point University's schools, including graduate schools. Our students' achievements reflect HPU's holistic learning approach and the dedication of its caring faculty. Thank you for being part of the 2026 High Point University Research and Creativity Symposium.

Dr. Joanne D. Altman
Director, Undergraduate Research and Creative Works
Director, Summer Research Institute (SuRI)
Professor of Psychology



THE 14TH HIGH POINT UNIVERSITY

RESEARCH AND CREATIVITY SYMPOSIUM (High-PURCS)

APRIL 14, 2026

Nido and Mariana Qubein Conference Center

7:30 am	**Registration**
8:00 am – 9:00 am	**Poster Session I & Technical Exhibits I** 2nd floor Concourse (Hallway) Premier Ballroom 2202 G
9:00 am – 9:20 am	**Welcome, Opening Remarks & Awards** Premier Ballroom 2202 G (Hallway)
9:30 am – 10:45 am	**Oral Session I** 2202 A-F
10:30 am – 11:45 am	**Poster Session II & Technical Exhibits II** 2nd floor Concourse (Hallway)
10:45 am – 11:45 am	**Vocal Performances** Premier Ballroom 2202G
11:45 am – 1:15 pm	**Oral Session II** 2202 A-F
12:45 pm – 2:00 pm	**Poster Session III & Technical Exhibits III** 2nd floor Concourse (Hallway)
1:15 pm – 2:00 pm	**Dance Performances** Premier Ballroom 2202G
12:30 pm – 2:00 pm	**Reception** Food in the Club Rooms

Congratulations to 2025-2026 Research Apprentices!

Research Rookies is a program for freshmen and first-semester sophomores who desire to be incorporated into the research and creative works atmosphere of High Point University while still early in their undergraduate careers. Participants have two consecutive semesters to complete a variety of activities. Completing this program earns the title of Research Apprentice and shows that students are committed to independent work, the products of which will give them an edge later in job interviews or applications for graduate or professional schools. This spring we are excited to congratulate eight** students who have recently completed the program and have earned the title of Research Apprentice.

New Spring 2026 Apprentices:

Beyza Aksoy*

Alex Dailey*

Trip Donaldson*

Kenna Escoz*

Jayden Micaela*

Sam Pate*

Emree Spivey

*Denotes students who completed the Research Rookies program in one semester in the fall.
**Not pictured here, as part of the New Spring 2026 Apprenticeship: Angel Bell.

Research Apprentices Recognized in the Fall 2025 Ceremony:

Justin Allan
Autumn Andreef
Hayden Blevins
Treasure Brown
Lily Bruner
Sophia Butironi
Jacob Chandler
Kaitlin Dellegrippo
Josh Elbertson
Caitlin Enright
Alexis Evatt
Isabella Frankovic
Callie Freeman
Jordan Havert
Natalie Hinson
Jackson Clark Jones
Alexa Klein
Leland Sanders
Denzel Sowa
Hannah Stewart
Claire Taylor
Colby Vullo
Westin Woodard

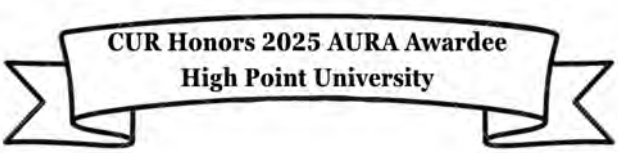
RESEARCH APPRENTICES

Oral Session I: 9:30 am -10:45 am

	Room A	Room B	Room C	Room D	Room E	Room F
Session I	Electrical Engineering	Biology & Biochemistry	Psychology	Strategic Communication, Game Design, Media Production	English I: French Literature	Honors I
9:30-9:45	Kendall Kobbe, Logan Klotz, & Michael Ryan	Evan Mills	Caitlin McCray, Contessa Kim, & Kellie Langa	Emma Gilchrist	Hannah Hulseman	Tatiana Antonini & Olivia Cerullo
9:45-10:00	Nicholas Maloziec, Robby Lang, & Michael Belew	Lily Bruner & Joyce Mondo	Abby Fort	Jacqueline Perry	Paige Osche	Elysia Hagstrom
10:00-10:15	Brett Sykes, Ashley Phelps, & Connor Dearman	Helia Osareh	Catherine Gallagher	Shakirah Scott	Reid Wheeler	Lily Grace Foister, Emerson Hansen, Amir Hamidpour, & Liana Conti
10:15-10:30	Morgan Abrams, Natalie Roberts, Eric Brockmann, & Jay Griffiths		Owen Pirolo		Quinn Fergusson	Morgan Bowdish, Carly Byrnes, Jack Roush, & Nick Jung
10:30-10:45					Molly McCarver	

Oral Session II: 11:45 am – 1:15 pm

	Room A	Room B	Room C	Room D	Room E	Room F
Session II	Data Science & Computer Science	Political Science & International Relations	Sociology, Anthropology & Religion	French & History	English II	Honors II
11:45-12:00	Jack Jaramillo	Anja Carlmark	Luke Prosa	Shelby Caruso	Owen Newcombe	Lilianna Allen, Isabel Boyles, Ryan Pitney, & Ashley Smith
12:00-12:15	Jeffrey Andreski Jr.	Nathan Lattimore	Cameron Siler-Nixon	Colton Marion	Jessica Steinbaugh	Paul Cusumano, Ethan Boufahreddin, Connor Hackett, & Demitrio Lukaitis
12:15-12:30	Isaac Denny	Sophia Pipta	Ivy Scott	Quinn Fergusson	Ashley Mullens	Arianna Ording, Caitlin Enright, Dominic Desideriosciolli, & Emily Bollinger
12:30-12:45	Quinn Ramsay	Trinity Stigler			Allie Fitzpatrick	Lily Bruner, Caroline Stuart, Trint Saunders, & Maddie Erwin
12:45-1:00					Madison Molis	Chase Hofmann, Emily Horne, Julianna Lubeck, & Reid Wheeler
1:00-1:15					Malia Agostinelli	



Poster Session I

8:00 a.m. – 9:00 a.m.

Board	Presenter(s)	Topic
1	Addison Cairns & Lanie Gardner	Biochemistry
2	Matthew Cox, Sophia Messerly, & Sara Hamidpour	Biochemistry
3	Trip Donaldson, Gian Llopis, & Scarlett Peabody	Biochemistry
4	Samantha Dowd, Stella Nelson, & Ethan Mendoza-Gonzales	Biochemistry
5	Macie Fox & Nelia Kelleher	Biochemistry
6	Jordan Havert &Tyler Janick	Biochemistry
7	Daniel Sapozhnikov	Biochemistry
8	Lillie Wilson	Biochemistry
9	Julia Crenshaw	Biochemistry
10	Gabriel Valenzano	Biochemistry
11	Rilee Bahner, John Marsh, & Natalie Maloziec	Biology
12	Hayden Blevins, Ashley Mullens, & Kendall Rhea	Biology
13	Avery Crowell	Biology
14	Alexis Evatt	Biology
15	Brett Freeman	Biology
16	Ellena Hou & Jill Stroup	Biology
17	Logan Loller, Kylee Link, Ellie Tejada, & Haven Tucker	Biology
18	Alea McRorie	Biology
19	Kaitlyn Ngo & Brian Ragoobir	Biology
20	Jack Quintana	Biology
21	Kayley Simon	Biology
22	Callie Walker	Biology
23	Sierra Werner	Biology
24	Jake Ankrum & Jacob Dening	Chemistry
25	Lucas Arciola	Chemistry
26	Chase Dillon	Chemistry
27	Maggy Henkel	Chemistry
28	Alyssa Lovallo	Chemistry
29	Isabel Marshall	Chemistry
30	Caitlin McCray & BriAnna Doll	Chemistry
31	Anna Venditti, Vasu Gandhi, & Victoria Dellapasqua	Chemistry
32	Madison Bunnell-Parker	Criminal Justice
33	Katelyn Combs	Exercise Science
34	Jak Kilzi & Noah Rauch	Exercise Science
35	Gracie Ritchey	Exercise Science
36	Will Toth	Exercise Science
37	Molly DeWees	Fashion Merchandising
38	Nick Sorensen	Health & Human Performance
39	Colton Marion	History

40	Angelica Bajenoff, Natalie Hinson, Joe Kasper, & Johnny Pohlman	Honors
41	Faith Bradley, Bella Gould, Julian Mullen, & Brennan Yi	Honors
42	Samantha Mailhot, Riley Mobley, Sterling Sharpe, & Nathan Dreitlein	Honors
43	Madison Molis, Abbey McRae, Valdimir Lagutin, & Alex Wallace	Honors
44	Braxton French, Clara Owen, Lauren Talley, & Gray Thompson	Honors
45	Natalie Beronio	Interior Design
46	Sophia Roglieri	Interior Design
47	Miriana Shorkey	Interior Design
48	Brianna Malone & Demetrio Lukaitis	Mathematical Sciences
49	Harlie Culbreth, Catherine Angeles, & Macy Schmelzer	Neuroscience
50	Dana Pitell	Neuroscience
51	Tania Story & Kelly Bell	Nursing
52	Alyssa Joshua	Physical Therapy
53	Josh Elbertson	Physics
54	Claire Klein	Physics
55	Zachary Ready	Physics
56	Meredith Day	Psychology
57	Lily Grace Foister	Psychology
58	Catherine Gallagher	Psychology
59	Finnigan Gilbert	Psychology
60	Harper Melnick & Phoebe Dillon	Psychology
61	Mikayla Moxley	Psychology
62	Alexis Ross	Psychology
63	Tory Puharic, Samantha Gartner, & Makenzie Streed	Psychology
64	Jeffrey Andreski Jr.	Statistics

Technical Exhibits I

8:00 a.m. – 9:00 a.m.

Space	Presenter(s)	Topic
65	Noah Bernabe, Joshua Mancini, Jaden Harnar, Will Battle, Luke Harless, Riley Siegel, & McConnico Sharpe	Game Design
66	Zach Chodash, Sean Heenan, James Branford, & Luke Fixari	Game Design
67	Samuel Goodman, Matthew Gherardini, Dillon Peed, & Leeann Bailey	Computer Science

Welcome, Opening Remarks, & Awards

Welcome by Dr. Dan Erb, Provost

9:00 am – 9:20 am

Premier Ballroom - 2202 G

Poster Session II

10:30 a.m. – 11:45 a.m.

Board	Presenter(s)	Topic
1	Sophia Bellino, Cooper Burnett, Samantha Dowd, Caitlin Michaelis, & Veda Puri	Biochemistry
2	Lillian Gray	Biochemistry
3	Eleanor Lee	Biochemistry
4	Emma Renee Monge	Biochemistry
5	Gabriella Orecchio & Trip Donaldson	Biochemistry
6	Shauna Skow	Biochemistry
7	JJ Zheng, Eli Ravenell, & Kaden Mabry	Biochemistry
8	Luke Bantamoi	Biology
9	Kal Hyun Burgess-Hicks	Biology
10	Addison Cairns, Cienna Casillas, Carmella Colon, Karen Francoeur, Nicolas Gonzalez, Jake Kimbro, & Amare Stewart	Biology
11	Sophia Castillo & Kaitlin Dellegrippo	Biology
12	Alekxander Gouge	Biology
13	Holley Lowe	Biology
14	Francela Mejias-Solano	Biology
15	Rebekah Olls & Jack Schoultz	Biology
16	Hannah Stewart & David Simin	Biology
17	Riley Verner, Mathew Balas, & Kaitlin Hughes	Biology
18	Anthony Walters Jr.	Biology
19	Justin Allan	Chemistry
20	Burton Brewer	Chemistry
21	Sarah Czuba	Chemistry
22	Imogen Irons & Sophia Messerly	Chemistry
23	Nathan Stockman	Chemistry
24	Westyn Woodard & Callie Freeman	Chemistry
25	Ariel Trzebiatowski	Data Analytics
26	Connor Kresock	Economics
27	Vladimir Lagutin	Electrical Engineering
28	Madison Danser	Exercise Science
29	Zaria Owens	Exercise Science
30	Johan Schwartz	Exercise Science
31	Nick Sorensen	Exercise Science
32	Jessie Vozar	Exercise Science
33	Laney Schenher	Forensic Psychology
34	Alexa Klein & Kipton Travis	Health & Human Performance
35	Gabriela Lowe & John Michael Zimmerman	Health & Human Performance
36	Natalie Beronio, Jayme Erdtman, Margaret Garr, & McKenna Ulmer	Honors

37	Anyia Brooks-Manning, Nathan Brent, Natalie Jensen, & Ryan Monroe	Honors
38	Larissa Paddock, Tyler Meadows, Bella Smith, & Michael Galla	Honors
39	Hailey Coggs	Interior Design
40	Alyssa Ruland	Interior Design
41	Moorea Barbee	Medical Sciences
42	Isabella Frankovic & Alexandra Shutters	Neuroscience
43	Alexis McCue	Neuroscience
44	Syd Ryan	Neuroscience
45	Ash Appel, Rachel Grise, Ariel Howard, & Nate Smith	Philosophy
46	Helia Osareh	Physical Therapy
47	Aubrey Fessler	Physics
48	Megan Mueller	Physics
49	Caitlyn Winegeart	Physics
50	Madison MacDonald	Psychology
51	Lily Grace Foister, Genevieve Schultz, Catherine Gallagher, & Jessamina Piazza	Psychology
52	Jackson Jones, Brooke Kozak, & Arielle McPhee	Psychology
53	Ciera Pellicciotta	Psychology
54	Eva Richardson	Psychology
55	Leland Sanders	Psychology
56	Brianna Tyler	Psychology
57	Sophie MacDonald & Kat Karwoski	Psychology
58	Abby Elburn	Strategic Communications

Technical Exhibits II

10:30 a.m. – 11:45 a.m.

Space	Presenter(s)	Topic
59	Amaris Jenkins	Game Design
60	Ashley Poteat & Mark Metcalf	Game Design
61	Amir Hamidpour	Computer Science

Poster Session III

12:45 p.m. – 2:00 p.m.

Board	Presenter(s)	Topic
1	Madison Burnett, Abbigail Locklear, & Joely Pepe	Biochemistry
2	Aubrey Durham & CJ Gulla	Biochemistry
3	Bryce Grier	Biochemistry
4	Caitlin Michaelis, Koby Mante, & Jacob Dening	Biochemistry
5	Logan Rampetsreiter	Biochemistry
6	Sierra Werner, Julia Matachun, & Lindsay White	Biochemistry
7	Brooke Aleman, Kamauri Brown, Elizabeth Harris, Danielle Hinte, Eleanor Lee, Selah McAdams, & Kiyah Sherman	Biology
8	Laird (Hootie) Bickford	Biology
9	Youliana Hadgu	Biology
10	Nicole Korczyk	Biology
11	Katie McDonald	Biology
12	Nelia Kelleher, Peyton McAuliffe, Sydney Slater, & Liliana Carroll	Biology
13	Tory Puharic & Grace Heltzman	Biology
14	Ellie Ratta & Brian Ragoobir	Biology
15	Kayleigh Reardon	Biology
16	Kara Vaartjes & Aubrey Church	Biology
17	Colby Vullo, Emma Ducharme, & Imani Bascoe	Biology
18	Zachary Workman, Alex Kaelin, & Elizabeth Kelly	Biology
19	Aaliyah Coley	Chemistry
20	Garland Greene	Chemistry
21	Kaley LeFevre	Chemistry
22	Isabel Marshall	Chemistry
23	Claire Taylor	Chemistry
24	Sara Hamidpour	Electrical Engineering
25	Justin Benton & Mia Lozada	Exercise Science
26	Gavin Frey & Graeme White	Exercise Science
27	Amanda Mamrick	Exercise Science
28	Allie Pratt & Molly McCarver	Exercise Science
29	Brian Shaw	Exercise Science
30	Morgan Stephens & Jane Long	Exercise Science
31	Lilianna Allen	French
32	Kaitlyn Sanchez	History
33	Haley Gorman, Contessa Kim, Ashley Mullens, & Nathan Stockman	Honors
34	Luke Bantamoi, Ava Pierce, Emma Renee Monge, Nora Fallon, & Hayley Martin	Honors
35	Payten Meyer-Senkarik, Daniel Pitt, Logan Muller, & Finn Twomey	Honors
36	Madison Elliott, Celia Langone, Connor Kresock, & Emma Schwindt	Honors

37	Julia Andresson, Riley Verner, Audrey Houle, & Cassidy Kreiger	Honors
38	Andrew Wester, Lillie Wilson, Gianna Kocur, & Vaughn Selders	Honors
39	Kamden Ray	Interior Design
40	Nikki Schreiber	Interior Design
41	Melanie Zylberberg	Medical Sciences
42	Chloe Buffalino	Neuroscience
43	Kal Hyun Burgess-Hicks	Neuroscience
44	Christopher Phillips	Neuroscience
45	Catherine Summerrow & Julia Crenshaw	Neuroscience
46	Jadaa Cruz	Physical Therapy
47	Devon Derrenbacher & Brady Thomas	Physical Therapy
48	Kennady Milligan & Westyn Woodard	Physical Therapy
49	Skyler Gangestad	Physics
50	Thomas Owens	Physics
51	Gabriella Abadir & Julia Ravega	Psychology
52	Kayla Denoo	Psychology
53	Gavin Klueg	Psychology
54	Eva Morris	Psychology
55	Jessamina Piazza	Psychology
56	Ashley Rodriguez	Psychology
57	Laney Schenher & Brianna Tyler	Psychology
58	Lauren Yaroma	Psychology

Technical Exhibits III

12:45 p.m. – 2:00 p.m.

Space	Presenter(s)	Topic
59	Francisco Ortiz & Damien Gross	Game Design
60	Clara Owen, Nate Zapata, Brad Killian, & Claire Meehan	Game Design
61	Margaret Underwood & Bonnie Ni	Game Design
62	Christopher Langhorne & Mason Sheehan	Computer Science

Performances

Vocal and Musical Performances: 10:45 a.m. – 11:45 a.m.

Percussion Presenters	Media Presentation
Finnigan Gilbert, Andrew Porter, Joseph Umina, & Marc Delgallo	*PASIC: Percussive Arts Society trip*

Vocalist	Song	Musical/ Artist
Alexa Beck	"I Cain't Say No"	*Oklahoma!*
Quinn Fergusson	"Stars"	*Les Misérables*
Daniel Hoecker	"Never Fall in Love with an Elf"	*Elf*
	"Still Hurting"	*The Last Five Years*
Tessa Lamb	"In My Dreams"	*Anatasia*
Ella Marron	"She Used to be Mine"	*Waitress*
Ashley Mullens	"Goodbye, Little Dream, Goodbye"	*Anything Goes*
	"I Don't Need a Roof"	*Big Fish*
Madeleine Rubino	"Good Girl"	Carrie Underwood
	"In The Kitchen"	Renee Rapp
Gabriella Vitelli	"What I Did for Love"	*A Chorus Line*
	"Journey to the Past"	*Anastasia*
Alyssa Vogt	"My Days"	*The Notebook*
	"You Don't Know This Man"	*Parade*
Hailey White	"Wait My Turn"	*Suffs*
	"Pulled"	*The Adams Family*

*Keyboard Accompaniment is provided by Ken Davis.

Dance Performances: 1:15 p.m. – 2:00 p.m.

Presenter(s)/Dancers	Title	Dancers
Monica Kepins	*InterCurrent*	Elizabeth Devine, Sophie Hanks, & Devlin Turner
Jessamina Piazza	*I Will Carry You*	Gianna Aiello Williams, Nicole Amorocho, Natalee Balestra, Addison Clary, Maryna Crawford, Toni Frost, Catherine Gallagher, Catrina Gromley, Monica Kepins, Addison Lee, Jessamina Piazza, Emerson Schmidt, Devlin Turner, & Madison Walsh
Kendall McDowell	*In the Mourning*	Kaitlyn DeGraw, Mia Geter, Ava Griswold, Ryann Perry, & Genevieve Schultz
Catherine Gallagher	*flow*	Nicole Amorocho, Natalee Balastra, Toni Frost, Catherine Gallagher, Monica Kepins, Jessamina Piazza, Emerson Schmidt, Genevieve Shultz, & Devlin Turner

Poster Session I

2nd Floor Concourse (Hallway)

8:00 am – 9:00 am

Biochemistry

(1) Characterization of a Putative Alpha Carbonic Anhydrase from Hypsibius Exemplaris: Insights into Enzymatic Properties and Potential Biotechnological Applications

Addison Cairns*, Lanie Gardner*, & Webb Garrett

Mentor: Kelsey Kean, Chemistry

Carbonic anhydrase is an enzyme that catalyzes CO2 hydration to bicarbonate and protons, playing vital metabolic roles. This study characterizes a putative α-carbonic anhydrase (HeCA-α313) from the tardigrade Hypsibius exemplaris. This research advances understanding of extremophile carbonic anhydrases for potential biotechnological applications.

(2) Characterizing FAST-PETase Activity For Plastic Degradation

Matthew Cox*, Sophia Messerly*, & Sara Hamidpour*

Mentor: Kelsey Kean, Chemistry

Twelve percent of global waste is PET (polyethylene-terephthalate) plastic, found in packaging, bottles, and clothing. This project studies FAST-PETase, an enzyme that depolymerizes PET into monomers, aiming to protect the environment by enabling effective recycling of this widespread material.

(3) FAST-PETase: A Tiny Enzyme Tackling a Massive Plastic Problem

Gian Llopis*, Scarlett Peabody*, & Trip Donaldson*

Mentor: Kelsey Kean, Chemistry

Nearly all plastic ever created still exists today. That's roughly 600 million tons of polyethylene-terephthalate (PET) infiltrating every corner of life. This project researches an enzyme called FAST-PETase, which possesses tools that could end this problem by giving nature the ability to eat plastic by depolymerizing PET.

(4) The Effectiveness of PETase in Breaking Down PET Plastic

Samantha Dowd*, Stella Nelson*, & Ethan Mendoza-Gonzales*

Mentor: Kelsey Kean, Chemistry

PET plastic (Polyethylene terephthalate) is widely used to produce virtually all single-serving plastic bottles. More than 80 million metric tons of PET plastic are produced each year globally. Our research aims to test the effectiveness of PETase, an enzyme, in degrading PET plastic and helping to reduce environmental pollution.

(5) Investigating Enzymatic Activity and Disease-Linked Mutations of Non-Lysosomal β-Glucosylceramidase 2 Through In Vitro and In Vivo Approaches in Drosophila melanogaster
Macie Fox* & Nelia Kelleher*
Mentor: Kelsey Kean, Chemistry
Disruption of non-lysosomal β-glucosylceramidase 2 (GBA2) is linked to several motor neuron disorders, yet its molecular mechanisms remain unclear. Using recombinant expression and fluorescence-based assays, we confirm the activity of putative GBA2 orthologs and assess disease-related mutations while analyses of motor function in Drosophila are performed in a collaborating lab.

(6) Natural Products from Aquatic Fungi as Novel Treatments for Neurodegenerative Disease.
Tyler Janick*, Jordan Havert*, Rutwa Patil, & Micheal Grider
Mentor: Grace Hamilton, Biochemistry
Alzheimer's Disease involves reduced levels of the neurotransmitter acetylcholine, making acetylcholinesterase (AChE) a key therapeutic target. Current inhibitors can be costly and cause side effects. We screened fungi collected from marine and freshwater habitats for AChE inhibitors, identifying these extracts as promising sources of novel bioactive compounds.

(7) Knocking Out Candidate Dimorphic Genes in Knufia Petricola
Daniel Sapozhnikov*
Mentor: Grace Hamilton, Biochemistry
Our research aims to enable DNA transformation in the extremotolerant fungus Knufia petricola. By developing a protocol to efficiently remove fungal cell walls, the project establishes a foundation for introducing foreign DNA and performing genetic studies to better understand the genetic basis of extremotolerance.

(9) Identification and evaluation of antibiotic adjuvants for therapeutic potential against Acinetobacter baumannii
Lillie Wilson*, Burton Brewer, Chloe Cox, & Kiara Busby
Mentor: Meghan Blackledge, Chemistry
Acinetobacter baumannii is a rapidly evolving, multidrugresistant pathogen of growing global concern. Our lab develops antibiotic adjuvants that enhance antibiotic activity by blocking resistance mechanisms. We identified novel active compounds, defined structureactivity relationships through focused library screens, and initiated mechanistic studies. Key findings from these assays will be presented.

(8) Enhancing BRAF Inhibitor Efficacy in Melanoma Treatment
Julia Crenshaw*
Mentor: Victoria Del Gaizo Moore, Basic Pharmaceutical Sciences
UV-induced DNA damage in melanocytes causes melanoma, which often resists chemotherapy after metastasis. We propose that the combination of a known BRAF inhibitor and a novel molecule will yield synergistic effects, enhancing the inhibitor's efficacy and offering a more potent treatment for malignant cancers.

(10) Assessing the Activity of Novel Antibiotic Adjuvant Analogs in MRSA
Gabriel Valenzano*
Mentors: Heather Miller & Meghan Blackledge, Chemistry
Methicillin-resistant *Staphylococcus aureus* (MRSA) is a dangerous bacterium that is quickly becoming a worldwide health issue due to its antibiotic resistance. These resistance mechanisms can be inhibited with novel adjuvant compounds to repotentiate antibiotics. Analog compounds of the known adjuvant, loratadine, were evaluated for repotentiation of oxacillin.

Biology

(11) In Vitro and Ex Vivo Assessment of Anti-Cataract Properties of Flavonoids
Rilee Bahner*, John Marsh*, Natalie Maloziec*, Hailee Gosart, Kiernan McDonald, & Billy Hayden
Mentor: Jeremy Whitson, Biology
Photooxidation-induced aggregation of lens proteins contributes to cataract formation. Using in-vitro homogenized lenses and ex-vivo cultured lenses exposed to hydrogen peroxide and UV stress, we tested plant-derived flavonoids for protective effects. Daidzein and apigenin reduced aggregation in vitro, suggesting potential anti-cataract agents warranting animal-model evaluation.

(12) Phenotypic Differences in Drosophila Melanogaster Wing Morphology Upon Knockdown of Specific Genes
Hayden Blevins*, Ashley Mullens*, & Kendall Rhea*
Mentors: Kenneth McKenna & Matt Talbert, Biology
Body-part scaling maintains proportional morphology, yet genetic variation can alter these relationships. Using three *Drosophila melanogaster* DGRP lines, we examined gene-induced effects on wing-to-body scaling. Wing and body measurements were analyzed, and GWAS identified candidate loci associated with scaling variation. Three genes were selected for knockdown to test their roles in growth plasticity.

(13) Pigment Composition and Photosynthetic Gas Exchange in Different Colored Autumn Leaves of Sweetgum, Liquidambar styraciflua
Nicole Hughes, Avery Crowell*, & Alex Contreras
Mentor: Nicole Hughes, Biology
The breakdown of chlorophyll in autumn corresponds to dramatic color change in leaves of deciduous trees. However, misconceptions remain among the public and some scientists related to pigment combinations responsible for different autumn hues. Our research characterized pigment combinations in sweetgum responsible for yellow, orange, red and purple colors.

(14) Ecological effects of abaxial anthocyanin pigments in floating leaves of aquatic plants
Alexis Evatt* & Zachary Workman
Mentors: Nicole Huges & Vernon Coffield, Biology
The purpose of red and purple undersides on aquatic angiosperm leaves is not well studied. We tested the effects of a simulated anthocyanin layer on algal growth and fish reproduction. Filters mimicking the transmittance spectra of Nymphaea alba were used to simulate light conditions for Chlorella vulgaris and Danio rerio.

(15) Isolation and Identification of an Unknown Bacteriophage from Commercially Available Bacillus thuringiensis

Brett Freeman*

Mentor: Dinene Crater, Biology

Bacillus thuringiensis (Bt) is a gram-positive soil bacterium that is used as a natural insecticide. We isolated a bacteriophage from a commercially available stock of *Bt*. The purpose of the research is to perform molecular and physical characterization of this phage, TBt.ph1, to determine if it is specific to *Bt*.

(16) Microfluidic Chips for Studying Biofilm Growth

Ellena Hou* & Jill Stroup*

Mentor: Keir Fogarty, Chemistry

This project involves fabricating PDMS microfluidic chips using 3D-printed molds to create controlled microenvironments for studying microbial and biofilm growth. Fluorescent Microspheres are currently used to evaluate channel integrity and flow behavior. Future work will apply the platform to study biofilm formation and long-term microscopy experiments.

(17) Characterizing the Interaction Between Arthrobacter globiformis and Bacteriophage NidoQ

Logan Loller* & Kylee Link*, Ellie Tejada* & Haven Tucker*

Mentor: Dinene Crater & Megan Bowman, Biology

SEA-PHAGES enables undergraduates to discover and analyze bacteriophages. We isolated and characterized an unknown bacteriophage, "NidoQ," from a local soil sample. Using *Arthrobacter globiformis* for enrichment, we were able to produce plaques that were used for analysis. This work expands knowledge of phage diversity and research into biotechnology and medicine.

(18) Temporal Analysis Of ANT2 In Relation To The Cellular Circadian Clock

Alea McRorie*

Mentor: Alexander Mosier, Biology

Circadian biology examines how organisms maintain a roughly 24-hour rhythm. This project investigates the protein ANT2/ SLG25A5 (E289D) to determine whether it follows daily circadian patterns. Using western blotting to measure protein levels and phosphorylation over time, the study aims to identify circadian regulation of this protein and associated pathways.

(19) Recent history of land-use and mosquito vector abundance change in Forsyth County North Carolina

Kaitlyn Ngo* & Brian Ragoobir*

Mentors: Megan Bowman & Daniel Greene, Biology

In North Carolina, endemic zoonotic mosquito-borne diseases, such as La Crosse encephalitis, pose a threat to human health. Many counties do not have the resources for thorough mosquito surveillance. Using GIS analyses and regression-based modeling, we aim to identify predictors of vector mosquito prevalence in Forsyth County, NC.

(20) Exploring EVs: Isolation of Bacterial EVs To Stimulate a Healthy Gut
Jack Quintana*
Mentor: Elijah Sage & Elyse Zeffiro, Biology
Anti-aging research has thoroughly demonstrated the importance of the gut microbiome and its impact on the aging process. Stimulation of healthy gut bacteria through extracellular vesicle (EV)-based therapies could prevent age related gut diseases. This project seeks to increase the EV production from bacteria after the application of stressors.

(21) The Mysterious Connection Between Glutathione and Urea in the Lens
Kayley Simon*, Elizabeth Rubeira, Billy Hayden, Alejandra Soto, David Sell, Zongbo Wei, Xingjun Fan, &Vincent Monnier
Mentor: Jeremy Whitson, Biology
LEGSKO mice demonstrate natural glutathione deficiency and strong UTB upregulation, linking GSH to urea exportation. LCMS detected low GS in all lens regions in total, however it made up the same fraction of total GSH as in WT. Findings suggest GSH protects lens proteins by undergoing carbamylation itself, protecting lens crystallins.

(22) Relationships Between Enamel Thickness, Diet, and Body Mass in Primates
Callie Walker*
Mentor: James Pampush, Health and Human Performance
This study examines enamel thickness across primate species to understand relationships between tooth morphology, diet, and body mass. Using measurements from tooth cross-sections, it investigates how enamel thickness reflects dietary mechanical challenges and provides insight into how primate teeth have evolved to adapt to the material properties of different diets.

(23) Circadian Protein Interactions and Phosphorylation Processes
Sierra Werner*
Mentor: Alexander Mosier, Biology
Circadian biology studies a core cellular timing process that helps organisms coordinate reactions essential for survival. Despite its importance, little is known about interactions outside this core mechanism that drive downstream outcomes from sleep cycles to cancer risk. This project examines circadian MTOR-phosphorylation timing and interacting proteins shaping downstream processes.

Chemistry

(24) Novel Mechanisms of Rhodamine Fluorescence with Implications in Molecular Sensing
Jake Ankrum* & Jacob Dening*
Mentor: Keir Fogarty, Chemistry
Rhodamine B (RB) derivatives are fluorescent probes with molecular switches that enable detection of nanoscopic events. In this work, we propose the implementation of a multi-faceted single-molecule microscope for spectroscopic analysis of RB aggregation, demonstrating potential applications in biomedical imaging and optoelectronics.

(25) Optimization of the Surface Functionalization Parameters for the Preparation of Conjugated Polymer Brush Films

Lucas Arciola*
Mentor: Pamela Lundin, Chemistry

A bond between a surface and a conjugated polymer chain can create unique properties for both, affecting their utility in organic electronics. We treated silicon wafers with APTES to create a terminal amine group to build up our polymer film. We optimized the time and concentration parameters of each step.

(26) Brominated Carbazole as an Antibiotic Adjuvant Scaffold: Transcriptomics Uncovers Conserved Differentially Expressed Genes in Methicillin-Resistant Staphylococcus aureus Strains

Chase Dillon* & Colin Phoebe
Mentors: Heather Miller & Meghan Blackledge, Chemistry

Methicillin-resistant *Staphylococcus aureus* (MRSA) has developed resistance to multiple antibiotics. Our study examined compound 8, a brominated carbazole, as an antibiotic adjuvant targeting serine/threonine kinase STK1. RNA-sequencing uncovered five conserved differentially expressed genes across four strains. RT-qPCR validation supports compound 8 as an effective adjuvant for oxacillin.

(27) A Novel Carbazole-Based Antibiotic Adjuvant Scaffold Induces Conserved Transcriptional Signatures in Antibiotic-Resistant Bacteria

Maggy Henkel*, Chase Dillon, Colin Pheobe, & Megan Blackledge
Mentors: Heather Miller & Meghan Blackledge, Chemistry

Compound 8, a carbazole-based antibiotic adjuvant scaffold, induces conserved transcriptional changes across multiple strains of the antibiotic-resistant bacterium MRSA. Comparative RNA-seq and RT-qPCR analyses identify shared differentially expressed genes linked to metabolism, stress response, and virulence, supporting compound 8 as a broadly useful scaffold for antibiotic adjuvant development.

(28) Surface Dilution of APTES with OTS to Reduce Catalyst Deactivation in Conjugated Polymer Brush Film Growth

Alyssa Lovallo*
Mentor: Pamela Lundin, Chemistry

Conjugated polymer brush (CPB) films offer improved mechanical properties, but the best catalyst for film thickness is also prone to deactivation due to proximity effects. I explored whether diluting the surface concentration (3-aminopropyl) triethoxysilane (APTES) for active polymer growth with inactive octyltrichlorosilane (OTS) can prevent these proximity effects.

(29) Loratadine decreases virulence of methicillin-resistant Staphylococcus aureus through the disruption of hemolysis.

Isabel Marshall*, Emma Renee Monge, & Maggy Henkel
Mentors: Heather Miller & Meghan Blackledge, Chemistry

Methicillin-resistant Staphylococcus aureus (MRSA) is a continued threat in hospital and community settings. MRSA relies on multiple virulence factors, including hemolysins (cytolytic toxins that lyse host red blood cells). Loratadine treatment reduced hemolysin mRNA levels in a human cell line infection model.

(30) Building Blocks of Novel Medications: Methodology Development of Yndiamides
BriAnna Doll* & Caitlin McCray*
Mentor: Brock Miller, Chemistry
Research in the Miller explores method Laboratory ology development for yndiamides. These molecules are versatile and can readily produce vicinal diamines that can serve as building blocks in drug discovery. Our laboratory has made progress towards synthesizing and isolating yndiamides. This presentation will provide an overview of our progress so far.

(31) An Inquiry-Based Undergraduate Chemistry Laboratory Integrating Artificial Intelligence for Biodiesel Synthesis and Data-Driven Analysis
Anna Venditti*, Vasu Gandhi*, Victoria Dellapasqua*, & Owen Mader
Mentor: Sarmad Hindo, Chemistry
This study describes the design of an inquiry-based undergraduate chemistry laboratory that integrates artificial intelligence into biodiesel synthesis. Students perform transesterification of renewable feedstocks while using AI tools to analyze experimental data and guide interpretation. The activity connects hands-on synthesis with data-driven exploration to strengthen understanding of core chemical principles.

Criminal Justice

(32) Sex Work on A College Campus
Madison Bunnell-Parker*
Mentors: Kirsten Piatak & Alec Szalewski, Criminal Justice
We conducted this exploratory study to investigate the prevalence of and motivation behind students who engage in sex work at High Point University. Approximately 6.5% of our sample indicated that they participated in traditional and non-traditional sex work. We discovered a range of motivations and methods of compensation.

Exercise Science

(33) Greater Peak Oxygen Uptake Is Linked to Higher Early Recovery Systolic Pressure, While Respiratory Exchange Ratio and Lactate Are Not
Katelyn Combs*, Madison Danser, & Johan Schwartz
Mentor: Colin Carriker, Health and Human Performance
This study examined whether blood lactate and respiratory exchange ratio were associated with central and brachial systolic blood pressure following maximal graded exercise. During the first 30 minutes of recovery, individuals with higher aerobic capacity exhibited slightly higher systolic pressures, whereas lactate and respiratory exchange ratio were unrelated.

(34) Impact Of Self-Reported Knee Pain On Peak Knee Joint Moments In Cutting Maneuvers And Drop Vertical Jumps In Female Collegiate Athletes.
Noah Rauch*, Jak Kilzi*, Garrett Hess, Kevin Ford, & Jeffrey Taylor
Mentor: Brett Pexa, Athletic Training
Participants performed drop vertical jump (DVJ) and 180° cutting tasks during team testing. In the DVJ, they dropped from a box and jumped toward an overhead target. In the CUT, they sprinted 6 m, planted on a force plate, and cut back. Knee moments were compared between participants reporting knee pain and those without.

(35) Pedal Vessel Calcifications In Diabetic Neuropathic Feet With Chronic Kidney Disease-Mineral Bone Disorder (CKD-MBD) Syndrome

Gracie Ritchey*, Olivia Powers, Michael Jones, & David Sinacore
Mentor: David Sinacore, Physical Therapy

Chronic kidney disease–mineral bone disorder (CKD-MBD) syndrome links kidney decline with arterial calcification, skeletal abnormalities, and increased cardiovascular risk. This study aimed to determine the prevalence, patterns, and odds of pedal vessel calcification locations in participants with diabetes mellitus and peripheral neuropathy across the five stages of the CKD-MBD syndrome.

(36) Single Leg Countermovement Jump Differences between ACLR and Uninjured Limbs in Collegiate Soccer Athletes

William Toth*, Brian Shaw, Kevin Ford, Garrett Hess, & Jeff Taylor
Mentor: Brett Pexa, Athletic Training

Force plate outcomes from a single-leg countermovement jump (SLCMJ) could be used following anterior cruciate ligament reconstruction (ACLR). Twenty-four collegiate soccer athletes performed SLCMJ with their ACLR and healthy limb on force plates. The ACLR limb showed consistent asymmetries compared to the healthy limb, with sex differences in force and power.

Fashion Merchandising

(37) Digital Marketing's Impact on the Environment

Molly DeWees*
Mentor: Victoria Brown, Fashion Merchandising

Digital marketing has become a prominent part of modern retail and advertising. Its emergence is due to an increase in consumer awareness and concern for sustainability. As companies shift from traditional marketing methods to digital, many questions come up regarding whether this transition will ultimately benefit or harm the environment.

Health and Human Performance

(38) Retrospective Analysis Of Dietary Antioxidants And Arterial Stiffness In Young And Middle-Aged Adult Males

Nick Sorensen*
Mentor: Jason Keeler, Health and Human Performance

Oxidative stress is a known contributor to cardiovascular disease (CVD). Thus, this investigation looked at the association between recalled antioxidant consumption and arterial stiffness in adult males. Dietary consumption of Vitamin E demonstrated a small inverse association with arterial stiffness.

History

(39) "Cuyer de Cozina"
Colton Marion*
Mentor: Amanda Allen, History
This research shows how different groups interacted within colonial Latin American kitchens. Through the analysis of Mercedes, or trans-Atlantic correspondences, I examine people of varied backgrounds and their level of agency using the "institution" of kitchens within this period.

Honors

(40) Food Allergies in Childhood: Examining Mental Health Implications and the Mediating Role of Social Isolation
Angelica Bajenoff*, Natalie Hinson*, Joe Kasper*, & Johnny Pohlman*
Mentor: Jay Putnam, Theatre
Food allergies affect millions of U.S. children and negatively influence their mental health through social isolation. This study examines how peanut allergy school practices affect anxiety and social participation among students in grades 1-8. Mixed-method surveys and interviews with children and caregivers will show how isolation shapes emotional well-being.

(41) Altruism: Discovering What's Underneath
Faith Bradley*, Bella Gould*, Julian Mullen*, & Brennan Yi*
Mentor: Timothy O'Keefe, English
Everyone has shared food at some point, but why do we share food? Do we have a biological desire to share, or are we motivated by other forces such as religion, culture, or upbringing? This study focuses on discovering the origins of altruism through interviews of faculty, staff, and students.

(42) Food Memories Within Theme Parks
Riley Mobley*, Samantha Mailhot*, Sterling Sharpe*, & Nathan Dreitlein*
Mentor: Timothy O'Keefe, English
This study examines how taste, theme, environment, and price shape memorable food experiences within theme parks. Using a quantitative survey of university students, it analyzes how pre-visit expectations and in-park experiences influence long-term memory and revisit intentions. Findings aim to clarify food's distinct role in enhancing overall theme park satisfaction.

(43) Feasibility of the Mediterranean Diet in North Carolina
Maddie Molis*, Abigail McRae*, Valdimir Lagutin*, & Alex Wallace*
Mentor: Pamela Lundin, Chemistry
This Honors research project examines the feasibility and adaptability of the Mediterranean Diet in North Carolina. Through surveys of residents and interviews with grocery store managers, we assess food availability, affordability, and consumer shopping patterns. Findings evaluate practical barriers and opportunities for implementing Mediterranean-style eating within diverse North Carolina communities.

(44) Devotion & Disordered Eating: Religiosity Among Muslims and its Impact on Eating Disorder Risk

Braxton French*, Clara Owen*, Lauren Talley*, & Gray Thompson*

Mentor: Silvana Rosenfeld, Anthropology

Our research studies the correlation between Islamic religiosity and risk of eating disorders. Data is gathered through interviews and a survey asking questions that measure participants' religiosity using CRS and their risk for disordered eating using the EAT-26 scale. This research could highlight an underrepresented group affected by disordered eating.

Interior Design

(45) Steelcase NEXT Law Office

Natalie Beronio*

Mentor: Jane Nichols, Interior Design

My NEXT law office design explores a contemporary legal workplace inspired by Los Angeles' underground tunnel racing and automotive history. I translated speed and mechanical durability through spatial planning and custom elements, including car door–inspired bookshelves, a reception desk modeled after car interiors, and a café light evoking burnout smoke.

(46) Beyond the Box: Spatial Creativity in Piet Blom's Cube Houses

Sophia Roglieri*

Mentor: Kathryn Brandt, Interior Design

This study examines the iconic Cube Houses designed by Piet Blom in 1984. Through analysis of their tilted cubic form, spatial organization, and interior adaptability, the research evaluates how these experimental design strategies continue to inform innovation, spatial efficiency, and creative problem-solving in contemporary interior design practice.

(47) NEXT Steelcase Law Firm Design

Miriana Shorkey*

Mentor: Jane Nichols, Interior Design

This project presents a biophilic workplace design for the NEXT Steelcase Design Competition, creating a hybrid law office in Los Angeles inspired by giant sequoia forests. The design integrates natural materials, daylight, greenery, and collaborative spaces to enhance employee well-being, support productivity, and encourage flexible work environments.

Mathematical Sciences

(48) Mapping Performance Metrics Over Time to Monitor Program Development: An Application of NCAA Track & Field Data

Demetrio Lukaitis* & Brianna Malone*

Mentor: Jakub Michel, Mathematical Science

Using NCAA track and field athlete data, we aim to identify which schools have progressing programs and which develop their athletes on a year-to-year basis. We answer these questions by analyzing statistical measures such that these stats inform recruits and transfers looking for an honest, data-driven evaluation of collegiate programs.

Neuroscience

(49) Brains, Bumps, and Buff Stuff: The Role of Creatine Prior to Receiving a Mild TBI on Long-Evans Rats

Harlie Culbreth*, Catherine Angeles*, Macy Schmelzer*, Isabella Frankovic, & Alexandra Shutters

Mentor: Bill Kochen, Neuroscience

Creatine supplementation may support brain energy metabolism, but its neuroprotective effects after mild traumatic brain injury (mTBI) remain unclear. Using Long-Evans rats across creatine and mTBI groups, this study assesses behavioral and biological outcomes. Preliminary results show interactions among creatine, injury, and sex, suggesting creatine may reduce mTBI-related neuropathology.

(50) Neuroprotective Effects of Penicillin Antarcticum Extract

Dana Pitell*

Mentor: Michael Grider, Neuroscience

After screening extracts from marine fungi, we identified Penicillium antarcticum with potential neuroprotective properties. We measured the protective ability of different concentrations of the extract on cultured neurons against hydrogen peroxide injury by assessing survivability. MTT analysis indicates increased neuronal survival, suggesting the extract plays a role in neural protection.

Nursing

(51) Rural Strain, Urban Gain? A Longitudinal Study of Flexible Staffing and Nursing Shortage Reduction

Tania Story* & Kelly Bell*

Mentor: Alexis Best-Rhodes, Nursing

This quantitative longitudinal study examines whether flexible staffing models reduce nursing shortages in rural areas more than urban hospitals. Guided by Betty Neuman's Neuman Systems Model, surveys of registered nurses at Atrium Health hospitals in Pineville (rural) and Charlotte (urban), North Carolina, will measure staffing adequacy, workload, and retention over time.

Physical Therapy

(52) Effects of Ankle Instability in Female Division I Athletes

Alyssa Joshua*

Mentor: Jamie Kronenberg, Physical Therapy

Ankle instability is a common injury in contact sport athletes. There were no differences in peak knee flexion during running between Division 1 female athletes who had a history of unilateral versus bilateral ankle instability. Future work may assess hip and ankle angles to better understand potential differences between groups.

Physics

(53) Design and Setup of a Focused Ultrasound Apparatus to Generate Cavitation Bubbles
Joshua Elbertson*
Mentor: Eric Rokni, Physics and Astronomy
In this study, we present a cost-effective apparatus used to create and study cavitation. This low-cost, reliable apparatus allows other institutions with limited resources to investigate cavitation and histotripsy, supporting the future research of many more people to investigate ultrasound induced tissue fractionation.

(54) Design And Characterization Of A Low-Cost Anechoic Chamber
Claire Klein*
Mentor: Eric Rokni, Physics and Astronomy
Accurate acoustic measurements require environments free of reflections and external noise. Anechoic chambers achieve this using sound isolation and foam wedges but are expensive. This project designs and characterizes a low-cost anechoic chamber at High Point University, detailing construction materials and measurements of transmission and reverberation time to enable research.

(55) Investigating Phantom Partials in Stringed Instruments
Zachary Ready*
Mentor: Eric Rokni, Physics and Astronomy
The sound of a piano consists of the fundamental frequency and harmonics, but recent exposure has revealed an obscure tone known as the phantom partial. The phantom partial occurs at sum and difference frequencies. I investigated if the phantom partials exist in other wooden, stringed instruments.

Psychology

(56) Childhood Adversity and Personality and Their Impact on Pain Catastrophizing and Disability
Meredith Day* & Sabrina Lombardo
Mentor: Kelly Curtis, Psychology
This study examined whether ACEs, alexithymia, and Type D personality predict pain catastrophizing and disability in adults with back pain. Hierarchical regression analyses revealed that alexithymia and pain catastrophizing significantly predicted disability beyond psychological distress, whereas ACEs and Type D personality did not independently contribute.

(57) The Interplay Between Substance Use, Disordered Eating Behaviors, and Problematic Social Media Usage
Lily Grace Foister*
Mentor: Deborah Danzis, Psychology
Problematic social media use, disordered eating and substance use are prevalent issues among young adults. This study examined the relationship between the three variables in 99 participants. Results showed that specific content engagement rather than overall problematic social media use predicted maladaptive behaviors, indicating a need for content specific interventions.

(58) Emotional Invalidation and Its Impact on Self-Criticism: Understanding the Link to Self-Injury and Suicidal Behavior

Catherine Gallagher*, Hannah Dobbs, & Laura Nagy

Mentor: Laura Nagy, Psychology

The present study tested whether emotional invalidation is related to NSSI and suicidality through high levels of self-criticism. The indirect effects of emotional invalidation on NSSI and suicidality through self-criticism were significant, suggesting that minor experiences of parental invalidation, not just explicit maltreatment, are associated with suicide risk.

(59) Rhythms of Relief

Finnigan Gilbert*

Mentor: Jana Spain, Psychology

This study examines whether participation in community drum circles can reduce perceived stress and whether participants' perceived social connection influences the magnitude of that reduction. Using a quasi-experimental design, participants complete pre- and post-session stress measures following a facilitated drumming session, exploring rhythmic engagement as an accessible music therapy intervention.

(60) Exploring the Relationship Between Family History and Mental Health Communication

Harper Melnick* & Phoebe Dillon*

Mentor: Kirsten Li-Barber, Psychology

A survey of 1,000 adults examined how family openness to discussing mental health and individuals' beliefs about its importance influence mental health behaviors and attitudes. Findings indicated that early family conversations predicted stronger beliefs in mental health maintenance, greater comfort discussing concerns, and a higher likelihood of seeking help during mental health crises.

(61) The Role of Perceived Outcome Expectancies in Shaping Stigma Toward Nonsuicidal Self-Injury

Mikayla Moxley*

Mentor: Laura Nagy, Psychology

This study tested whether stigma is higher for a hypothetical person with suicidal ideation or nonsuicidal self-injury and whether outcome expectancies predict stigmatization of these behaviors. Participants who reported interpersonal outcome expectancies endorsed more stigma. Findings suggest that anti-stigma campaigns should educate the actual functions of these behaviors.

(62) Assessing The Relationship Between The Lasting Impact Of Adverse Childhood Experiences And Early Adulthood Mental Health And Life Satisfaction

Alexis Ross*

Mentor: Deborah Danzis, Psychology

The relationship between Adverse Childhood Experiences (ACEs) was assessed correlationally with life satisfaction, anxiety, and depression. The researcher hypothesized that there would be a negative correlation between ACEs and life satisfaction, a positive correlation between ACEs and anxiety, and a positive correlation between ACEs and depression. All hypotheses were supported.

(63) College Students and ADHD: Differences in Stress, Cognition, and Brain Activity
Samantha Gartner*, Tory Puharic*, & Makenzie Streed*
Mentor: Daniel Krenzer, Psychology
This study examines cognitive, academic, and stress-related differences among college students diagnosed with ADHD, self-suspected ADHD, and controls. Using surveys, cognitive testing, HRV, and EEG to evaluate executive functioning, stress regulation, and academic skills to clarify performance profiles of the participants.

Statistics

(64) Analyzing the Relationship Between Interstate Migration and State Unemployment Rates
Jeffrey Andreski Jr.*
Mentor: Pujita Sapra, Mathematical Science
This study analyzes U.S. interstate migration from 1960 to 2000 using National Bureau of Economic Research data. Migration rates are compared with state unemployment rates from the Federal Reserve Bank of St. Louis to evaluate whether unemployment influences migration behavior and identify states whose migration patterns deviate from expected economic trends.

Technical Exhibits I

2nd floor Concourse (Hallway)
8:00 am – 9:00 pm

Game Design

(65) Nine Iron Realms
Noah Bernabe*, Joshua Mancini*, Jaden Harnar*, Will Battle*, Mcconnico Sharpe*, Luke Harless*, & Riley Siegel*
Mentor: Brian Heagney, Game Design
Nine Iron Realms is a game where the player explores the realms of Norse Mythology and stops the world-ending threat, Ragnarok, all while playing as the God of Minigolf and completing minigolf courses. Players will beat par, explore the Nine Realms, and have epic battles against the evil forces of Ragnarok in hopes of saving the world.

(66) Wymon
Sean Heenan*, Zach Chodash*, James Branford*, Luke Fixari*, Amaris Jenkins, & Ashley Poteat
Mentor: Brian Heagney, Game Design
Wymon is a game where players use their grapple shot to explore crystal filled caverns, volcanic caves, and water filled passageways to gather elemental abilities. Using the elements to empower their boomerang, they battle strange creatures and solve environmental puzzles in an attempt to find a way out of the depths.

Computer Design

(67) NFC Fraud Access Detection: Prevent NFC Skimming
Samuel Goodman*, Matthew Gherardini*, Dillon Peed*, & Leeann Bailey*
Mentor: Kedrian James, Computer Science
This research presents a real-time near-field communication fraud detection system that automates data analysis to flag fraudulent access events. Designed for campus and corporate environments, the solution integrates with existing databases, alerts users and administrators, and provides a flexible, user-friendly interface for monitoring and self-flagging access activity.

Oral Presentations

Oral Session I: 9:30 am – 10:45 am

Electrical Engineering — Room A

9:30 – 9:45
A Better Board Game
Kendall Kobbe*, Logan Klotz*, & Michael Ryan*
Mentor: Sean Johnson, Electrical Engineering
An interactive checkerboard will enable players to enjoy physical board gameplay across long distances. Using conductive tokens, circuit detection, and server communication, the board synchronizes moves between players and uses LEDs to display game states, recreating the social experience of traditional board games while connecting friends and family remotely.

9:45 – 10:00
Scan-Space
Nicholas Maloziec*, Robby Lang*, & Michael Belew*
Mentor: Sean Johnson, Electrical Engineering
Scan-Space is a hardware and software solution for accurate 3D room scanning and virtual furniture placement. Using LiDAR, 4K video, and Gaussian Splatting, it generates realistic digital environments. This autonomous, budget-friendly device enables consumers to confidently visualize furniture scale and aesthetics within their own homes.

10:00 – 10:15
From Guesswork to Precision: Redefining Docking with DockEye
Brett Sykes*, Ashley Phelps*, & Connor Dearman*
Mentor: Sean Johnson, Electrical Engineering
Docking is one of the most difficult tasks in boating, especially for novice operators of vessels between 15 and 35 feet. This project develops a low-cost, retrofit-friendly docking assistant to improve operator confidence, utilizing UWB ranging modules to precisely map the position of a boat to a mobile app.

10:15 – 10:30
RUFUS: The Future of Animatronics
Morgan Abrams*, Natalie Roberts*, Eric Brockmann*, & Jay Griffiths*
Mentor: Sean Johnson, Electrical Engineering
RUFUS is an AI-integrated animatronic designed to enhance user immersion and engagement. Combining mechanical movement, embedded electronics, and intelligent software, the system responds dynamically to user interaction. RUFUS demonstrates how animatronic technology can create more engaging and interactive experiences in entertainment and human-machine interaction by blending physical animation with adaptive AI behavior.

Biology and Biochemistry — Room B

9:30 – 9:45

Using Chemical Surface Modifications to Inhibit Methicillin-Resistant Staphylococcus aureus (MRSA) Biofilm Formation

Evan Mills* & Nathan Stockman

Mentors: Pamela Lundin & Meghan Blackledge, Chemistry

Methicillin-Resistant Staphylococcus aureus (MRSA) continues to pose a threat to hospitals around the world. This research looks to explore the use of self-assembled monolayers to inhibit the growth of MRSA biofilms on treated silicone rubber surfaces, which are used in types of catheters and are prone to developing bacterial biofilms.

9:45 – 10:00

Physiological Drivers of Toxoplasma gondii Egress Under Menadione-Induced Oxidative Stress

Lily Bruner*, Joyce Mondo*, & Kaden Fungfook

Mentor: Robert Charvat, Biology

Menadione induces *Toxoplasma gondii* egress from infected fibroblasts while generating oxidative stress. Because parasite egress depends on calcium signaling, we examined links between oxidative stress, calcium dysregulation, and parasite exit. Results suggest host cell age alters tolerance to menadione and may influence calcium-dependent pathways controlling egress within host cells.

10:00 – 10:15

The Amber Vial Effect: Could Colorful Pigments Protect Light-Sensitive Contents of Glandular Trichomes in Plants?

Helia Osareh*

Mentor: Nicole Hughes, Biology

This study investigates the potential function of red and purple pigments in glandular trichomes, specialized epidermal cells that produce protective compounds or digestive enzymes. We propose that anthocyanins and betacyanins may protect light-sensitive chemicals within these cells, acting similarly to amber pharmaceutical vials that shield compounds from photodegradation.

Psychology — Room C

9:30 – 9:45

Evaluating Study Strategy Beliefs and Usage in Middle School Students and Parents

Caitlin McCray*, Contessa Kim*, Kellie Langa*, Lily Grace Foister, Catherine Gallagher, Jessamina Piazza, & Genevieve Schultz

Mentor: Stacy Lipowski, Psychology

This study examined the beliefs that middle school students and parents hold about study strategies and the relationship between these beliefs and strategy usage. Sixth through eighth grade students and their parents completed online surveys. Results will discuss beliefs about study strategies and how parents teach their children about studying.

9:45 – 10:00

Evaluating Automatic Biases Through Criminal Profiling: An Analysis of Crime Media, Crime Type, and Similarity

Abby Fort*

Mentors: Deborah Danzis, Psychology; Martin Kifer, & J.R. Moller, Political Science

Criminal profiling, a controversial police investigative tactic, has been both instrumental and detrimental to historical police investigation practices. The tool's modern-day uses have been up to debate, but a significant gap in that research has been the effects that crime media, similarity to a profile, and crime type have on perception.

10:00 – 10:15

The Body and the Mind: Exploring Body Investment as a Mediator of Sexual Trauma and Suicidality

Catherine Gallagher*

Mentor: Deborah Danzis, Psychology

This study investigated body investment as a mediator between sexual trauma and suicidality in young adults. The direct and indirect pathways of the mediation model were significant, demonstrating partial mediation. The findings indicate that body investment partially explains the relationship between sexual violence and suicidality.

10:15 – 10:30

Predicting Willingness to Pay For Sustainably Branded Products: Effects of Recalling Prior Sustainable Behavior Moderated by Environmental Commitment

Owen Pirolo*

Mentor: Jana Spain, Psychology

Prior research showed social activism predicted higher willingness to pay for sustainably branded products, while values and concern did not. This experiment tests whether recalling a past sustainable behavior increases or decreases willingness to pay and whether that effect is moderated by environmental commitment on the PEBS Citizenship scale.

Strategic Communication, Video Games, and Media Production — Room D

9:30 – 9:45

Social Media and Climate Experience as Predictors of Youth Climate Science Efficacy

Emma Gilchrist*

Mentor: Sarah Vaala, Strategic Communication

This research examines relationships between social media environment, climate change experience, and perceptions of science and climate science efficacy among 13- to 22-year-old Americans. The model uncovers direct and moderated relationships between climate change experience and social media information on beliefs about scientists' credibility, prudence, objectivity, and benefits.

9:45 – 10:00
Split-Second Decisions: The Effect of Virtual Reality Environments on Fine Motor Skills
Jacqueline Perry*
Mentor: Brian Heagney, Game Design
The purpose of this study was to examine the correlation between environments with increased decision-making demands and their effects on fine motor skill performance, specifically concentration and precision. We hypothesized that fine motor skill performance would be negatively affected in high decision-making environments due to reduced concentration and precision, compared to low decision-making environments.

10:00 – 10:15
Behind The Pulpit
Shakirah Scott*
Mentor: Joseph Michaels, Media Production
Behind the Pulpit is a character-driven documentary exploring the human experience behind spiritual leadership. Through personal reflection and voices of family, mentors, and associates, the film reveals how identity, faith, and responsibility shape leadership beyond the pulpit.

English I: French Literature — Room E

9:30 – 9:45
Appetite and Hunger: An Examination of Feminine and Queer Desire
Hannah Hulseman*
Mentor: Virginia Leclercq, English
This essay examines appetite as a central metaphor in nineteenth and early twentieth-century French literature, linking feminine and queer desire. Through characters such as Emma Bovary, Vautrin, Lucien, and Claudine, it argues that hunger represents suppressed longing for love, power, and freedom within restrictive social and gender structures.

9:45 – 10:00
Borders and Bounds of the Feminine: Women's Limitations in Spaces in 19th-Century French Literature
Paige Osche*
Mentor: Virginia Leclercq, English
This paper argues that women's spatial mobility in nineteenth-century French literature is governed by patriarchal institutions. Examining works by Honoré de Balzac, Guy de Maupassant, and Émile Zola, it demonstrates how women are permitted into public and private spheres only when their presence advances male social, economic, or political interests.

10:00 – 10:15
Theatricality of Space, Performer, and Audience in 19th-Century French Literature
Reid Wheeler*
Mentor: Virginia Leclercq, English
Theatrical descriptions in novels reveal the performative desires of a society. Considering the industrial advancements in communication and a changing Parisian society, novels manifest a style of writing grounded in naturalist movements but still play to a performative sensationalism that gives readers an experience akin to watching live theater. Why?

10:15 – 10:30
"Like a Bird of Prey": The Imperial Predator in Maupassant's Bel-Ami
Quinn Fergusson*
Mentor: Virginia Leclercq, English
This paper examines the protagonist of Guy de Maupassant's 1885 novel, *Bel-Ami*, within the context of French colonial history. Through examination of his predatory actions and tendencies, this paper proposes that *Bel-Ami*'s main character, Georges Duroy, is a direct reflection of the French Empire's destructive colonial practices.

10:30– 10:45
The Decline of Catholicism in 19th-Century France: How Sand, Balzac, Flaubert, Zola, and Maupassant Shaped the Death of Catholicism Throughout the Century
Molly McCarver*
Mentor: Virginia Leclercq, English
In the aftermath of the French Revolution, French literature and political thought developed a tension between romantic idealism and the disillusionment of realism, showing hypocrisy embedded in the Church. This cultural shift was interpreted by authors struggling to reconcile faith and progress in the 19th century.

Honors I — Room F

9:30 – 9:45
Reclaiming The Past: Memory, Identity, And The Reversal Of Disney's Coming-Of-Age Anastasia
Tatiana Antonini* & Olivia Cerullo*
Mentor: Nathan Hedman, English
Many Disney "I Want" songs are an expression of autonomy and future desire. However, *Anastasia*'s "Once Upon a December" sequence redirects longing toward the past. It frames emotional memory as a strength, challenging narratives of independence and emphasizing growth grounded in connection, belonging, and continuity with one's origins.

9:45 – 10:00
Woman, Wife, Widow, Witch: The Wicked Sin of Female Autonomy in a Patriarchy
Elysia Hagstrom*
Mentor: Amanda Allen, History
This essay examines how witch hunts in Medieval and Early Modern Europe were a patriarchal tactic used to control women who defied social norms. Religious teachings, philosophical justifications, and societal expectations reinforced beliefs suppressing, diminishing, and demonizing women. Overall, witch hunts were a calculated effort to maintain patriarchal control.

10:00 – 10:15

Breaking Food Barriers: Can College Reverse Childhood Picky Eating

Lily Grace Foister*, Emerson Hansen*, Amir Hamidpour*, & Liana Conti*

Mentor: Timothy O'Keefe, English

Previous research links childhood socioeconomic status (SES) to picky eating but hasn't examined whether college-dining environments reduce SES-based differences. This study uses a cross-sectional correlational design with surveys from North Carolina university students analyzed via Pearson correlations. Findings may inform dining policy, food-access initiatives, and interventions targeting adult picky eating.

10:00 – 10:15

Food Subjectivity And How it Affects Diet

Morgan Bowdish*, Carly Byrnes*, Jack Roush*, & Nick Jung*

Mentor: Silvana Rosenfeld, Anthropology

This study examines the influence of bitter taste perception and dietary choices on weight. Full-time undergraduate students complete a lifestyle survey and then participate in a taste panel examining the bitterness of eight different foods. This study aims to find correlations between bitterness, healthy diets, and weight gain.

Poster Session II

2nd floor Concourse (Hallway)

10:30 am – 11:45 am

Biochemistry

(1) Design, Synthesis, And Evaluation Of Antibiotic Adjuvants Against MRSA
Sophia Bellino*, Cooper Burnett*, Samantha Dowd*, Caitlin Michaelis*, Veda Puri*, & Burton Brewer
Mentor: Meghan Blackledge, Chemistry
Antibiotic resistance in *Staphylococcus aureus*, particularly MRSA, threatens the effectiveness of existing therapies. This project focuses on the design, synthesis, and evaluation of small-molecule antibiotic adjuvants that restore antibiotic activity. By targeting bacterial resistance mechanisms and sensitizing MRSA to existing antibiotics, these compounds represent a promising strategy to extend the clinical lifespan of current antimicrobial treatments.

(2) Pretreatment With Loratadine Reduces Host Cell Cytotoxicity After MRSA Infection
Lillian Gray*, Chase Dillon, & Isabel Marshall
Mentors: Meghan Blackledge & Heather Miller, Chemistry
Methicillin-resistant *Staphylococcus aureus* (MRSA) is a pathogen that expresses many virulence factors. This study investigated whether loratadine, an antihistamine, reduces MRSA virulence in EA.hy926 human endothelial cells. Cells were pretreated with loratadine, infected with MRSA USA300, and hemolysin expression was measured by RT-qPCR with cytotoxicity assessed using LDH assays.

(3) Establishing Baseline AChE Activity Using Biochemical Assays to Evaluate Fungal Inhibitors
Eleanor Lee*
Mentor: Grace Hamilton, Chemistry
Several neurodegenerative diseases, including Alzheimer's Disease, involve a deficit in the neurotransmitter acetylcholine. One approach to treatment is to inhibit the enzyme acetylcholinesterase (AChE). Fungal metabolites are a source of possible inhibitors. We use biochemical assays to evaluate how— and how effectively— fungal compounds reduce human AChE activity.

(4) Enhancing Intracellular Accumulation and Inhibiting Efflux in MRSA with a Brominated Carbazole
Emma Renee Monge*, Bryce Grier, & Heather Miller
Mentor: Heather Miller, Chemistry
A brominated carbazole known as compound 8 was evaluated as an efflux inhibitor in MRSA. Accumulation assays revealed an increase in ethidium bromide retention. Efflux assays showed inhibition of EtBr expulsion, and the calculation of the IC50 was used to quantify compound 8's efflux inhibition.

(5) Metal Matters: Metallic Preference and Function in HeCA for CO_2 Conversion
Gabriella Orecchio* & Trip Donaldson*
Mentor: Kelsey Kean, Chemistry
To thrive in harsh environments, tardigrades, a type of extremophile, rely on specialized proteins. The Kean lab recombinantly expressed and purified an α-carbonic anhydrase (HeCA) from *Hypsibius exemplaris* to understand its unique properties. Metal preference and physiological function were studied with CO_2 hydration and pNPA assays, giving insight into the role of HeCA.

(6) Septin-Septin Interaction in Fungi
Shauna Skow*
Mentor: Grace Hamilton, Chemistry
Septins are GTP-binding cytoskeletal proteins essential for cell division and polarity. In Knufia petricola, the septin AspE interacts with Cdc11, but the role of its GTP-binding activity is unclear. Mutagenesis, nucleotide hydrolysis assays, and yeast two-hybrid analysis revealed how altered GTP binding affects AspE–Cdc11 interactions and septin regulation.

(7) PETase: An Enzyme That Breaks Down Plastic
JJ Zheng*, Eli Ravenell*, & Kaden Mabry*
Mentor: Kelsey Kean, Chemistry
Plastic pollution from PET plastic is a serious environmental problem. PETase is an enzyme that can break down PET plastic. We measured PETase activity to help us understand how effectively the enzyme breaks down the PET and how it could improve plastic recycling.

Biology

(8) Assessment of Posttranslational Modifications Across the Spatiotemporal Gradient of the Cynomolgus Macaque Lens
Luke Bantamoi*, Julian Rodriguez, Kelsey Ryan, Billy Hayden, Owen Kelley, Carol Shively, Emily Kolonia, & Jeremy Whitson.
Mentor: Jeremey Whitson, Biology
The lens spatiotemporal protein gradient offers a model for studying aging-related posttranslational modifications. Six fractions from aged macaque lenses were analyzed via Western blot for lysine acetylation, carbamylation, methylation, and methionine oxidation. Carbamylation and oxidation increased significantly toward the nucleus, indicating strong age-dependence, while acetylation and methylation showed less pronounced trends.

(9) The Circadian Clock of Neurospora Crassa
Kal Hyun Burgess-Hicks*
Mentor: Alexander Mosier, Biology
Circadian Biology is among the most unexplored subfields of biology, as little is known about how it maintains temporal regulation. By experimenting with software encountered via research on Github known as the Molecular Modeling Toolkit, we are developing new ways to analyze quantum biological environments in relation to core clocks.

(10) Discovery and Analysis of the ChipsNGuac Bacteriophage from Arthrobacter globiformis B-2979

Addison Cairns*, Cienna Casillas*, Carmella Colon*, Karen Francoeur*, Nicholas Gonzalez*, Jake Kimbro*, Amare Stewart*, Nelia Kelleher, Liliana Carroll, Peyton McAuliffe, Sydney Slater, & Dinene Crater

Mentors: Megan Bowman & Dinene Crater, Biology

Actinobacteriophage ChipsNGuac was isolated from soil in High Point, NC and infects Arthrobacter globiformis B-2979. This virulent phage was assigned to the FR cluster and has siphoviral morphology. ChipsNGuac has a genome length of 39,638 bp, GC content of 58.9%, and 68 predicted protein-coding genes, including ATPase, resolvase and endolysin.

(11) RNASeq Analysis of Toxoplasma gondii Treated with Fused Tricyclic Compounds

Sophia Castillo* & Kaitlin Dellegrippo*

Mentor: Robert Charvat, Biology

Toxoplasma gondii is an intracellular parasitic protozoan that infects many warm-blooded animals, including humans. RNASeq analysis of parasites treated with fused tricyclic compounds identified gene expression changes associated with drug exposure and therapeutic potential. Our results suggest that genes important for membrane transport and organelle biogenesis were most abundantly altered.

(12) Exploring EVs: Enhancement of EV-Mediated Bone Marrow Stem Cell Regrowth in Scratch Assays

Alekxander Gouge*

Mentors: Elijah Sage & Elyse Zeffiro, Biology

Extracellular vesicles (EVs) may contribute significantly to botanical medicines. This study evaluated EV source and concentration impacts on bone marrow stem cells (BMSC) using scratch assays. Results suggested a 2:1 ratio of EVs per cell that may increase cell proliferation, with milk and turmeric sources showing the most prominent effects.

(13) Exploring EVs: Updating the Current Isolation Protocols for Roots

Holley Lowe*

Mentors: Elijah Sage & Elyse Zeffiro, Biology

Extracellular vesicles (EVs) are lipid bilayer-bound particles produced by living cells that contain DNA, RNA and proteins from parent cells. Our project sought to optimize a standard operating procedure (SOP) for extracting EVs from dense plant sources without ultracentrifugation and minimizing filtration steps, while producing a high EV yield.

(14) Developing a hierarchy of genetic contribution using drosophila melanogaster

Francela Mejias-Solano*

Mentor: Kenneth McKenna, Biology

Using Drosophila wings, we are building a model of genetic contribution to the phenotype. The field generated a GRN model of genes involved in wing development. The first step is making a hierarchical model of genetic contribution; using Drosophila Transgenic RNAi Project to knockdown all wing genes GRN under GAL4 promoter.

(15) Epigeal Arthropod Community Dynamics as a Function of Urbanization in Guilford County, NC

Jack Schoultz* & Rebekah Olls*

Mentor: Daniel Greene, Biology

Urbanization reduces biodiversity as natural habitats are converted to impervious surfaces. We studied soil arthropods across 20 sites in Guilford County, NC, and linked their abundance to environmental factors that shape arthropod communities. Identifying the drivers of biodiversity loss in urban areas is critical for reversing these trends via conservation.

(16) Genetic Architecture of Wing Shape in Drosophila melanogaster

Hannah Stewart* & David Simin*

Mentor: Kenneth McKenna, Biology

Introductory genetics often defines evolution as changes in allele frequency, implying simple genotype–phenotype relationships. However, most traits are polygenic. To explore this, we analyzed wing shape variation in *Drosophila melanogaster* using DGRP lines and geometric morphometrics, revealing significant variation among 38 lines and over 500 wings.

(17) Effects of Bacillus thuringiensis and the GerE Protein Knockout on Vanessa cardui Caterpillars

Riley Verner*, Mathew Balas*, & Kaitlin Hughes*

Mentor: Dinene Crater, Biology

This study examines whether knocking out the GerE regulatory protein in *Bacillus thuringiensis* (Bt) affects its insecticidal activity against *Vanessa cardui* caterpillars. Baseline trials compare commercial Bt and lab-grown Bt before testing a GerE knockout strain. Caterpillar mortality will be monitored after feeding on Bt-treated Southland Products' multiple species diet.

(18) Investigating Circadian Control of ABC Transporter Protein Expression in Neurospora Crassa

Anthony Walters Jr.*

Mentor: Alexander Mosier, Biology

The circadian clock regulates daily gene expression and protein levels. Using Neurospora crassa, this study tests whether an ABC transporter protein oscillates with the clock. Western blot analysis measures protein abundance at different times and evaluates phosphorylation states, providing insight into how circadian rhythms influence ABC transporter activity and its temporal regulation overall.

Chemistry

(19) Exploration of Fluorescent Aggregate Particles exhibited by Rhodamine-B Amide Derivatives (RADs) using Spin-Coating and a Scanning Electron Microscope (SEM)

Justin Allan*

Mentor: Keir Fogarty, Chemistry

The Fogarty Lab investigates fluorescence of rhodamine-B amide derivatives (RADs), observing blue fluorescence attributed to aggregation-induced emission (AIE). We hypothesize that the blue-fluorescing aggregates are carbon dots, which are nanoparticles formed from organic RAD molecules. This study aims to characterize the size of these nanoparticles using a scanning electron microscope.

(20) Novel Antibiotic Adjuvants in ESKAPE Pathogens
Burton Brewer*, Chloe Cox, Gabe Valenzano, & Kiara Busby
Mentors: Heather Miller & Meghan Blackledge, Chemistry
ESKAPE pathogens cause highly infectious, drug-resistant infections posing a major global health threat. Instead of developing new antibiotics, antibiotic adjuvants can inhibit resistance mechanisms and restore antibiotic efficacy. Research in the Blackledge lab identified promising adjuvants with increased activity. The structure–activity relationship in ESKAPE pathogens will be discussed.

(21) Peptide Coupling
Sarah Czuba*
Mentor: Pamela Lundin, Chemistry
A rhodamine B monomer was synthesized using ammonia in dioxane to introduce an amide linkage. As this compound is unreported in literature, efforts focused on purification and characterization. Analytical techniques including TLC and NMR were used to evaluate purity and identify areas for improving isolation of the monomer.

(22) Expanding the Phylogenetic Landscape of Lactate Monooxygenases: Insights from Beauveria bassiana
Imogen Irons* & Sophia Messerly*
Mentor: Kelsey Kean, Chemistry
Lactate monooxygenase (LMO) is an FMN-dependent flavoenzyme that converts lactate to acetate, CO_2, and H_2O via a coupled pathway. We report recombinant expression, purification, and characterization of a putative fungal LMO from *Beauveria bassiana*, expanding its known distribution and highlighting its potential for biocatalytic applications.

(23) Exploring The Breadth of Biofilm Inhibition Across Different MRSA Strains by Aminoalkylsilane-Treated PDMS Rubber
Nathan Stockman* & Evan Mills
Mentors: Meghan Blackledge & Pamela Lundin, Chemistry
We have established that AUTES treatment is proficient at inhibiting biofilm growth of the USA43300 MRSA strain on polydimethylsiloxane (PDMS) surfaces. To make this project more applicable to a real-world medical environment, we have now explored biofilm inhibition using additional clinical MRSA strains USA100 and USA300.

(24) Evaluating the Impact of ChemDraw and Chem3D Integration in General Chemistry Laboratories on Student Understanding and ACS Exam Performance
Westyn Woodard*, Callie Freeman*, Ryland Brady, & Syndey Wargo
Mentor: Sarmad Hindo, Chemistry
This study examines integrating ChemDraw and Chem3D into general chemistry labs to improve understanding of Lewis structures and VSEPR theory. Compared to traditional instruction, students using modeling software showed improved performance on assessments and ACS exam questions, along with greater confidence and engagement, supporting early incorporation of digital tools.

Data Analytics

(25) Modeling Glycohemoglobin (HbA1c) for Efficient Patient Lifestyle Management
Ariel Trzebiatowski*
Mentor: Pujita Sapra, Mathematical Science
Glycohemoglobin (HbA1c) is a key indicator of long-term blood glucose control and diabetes risk. This study uses various statistical and machine learning methods to examine whether body composition, physical activity level, sedentary time, demographic factors, and metabolic indicators help manage HbA1c levels for enhanced preventative healthcare and patient care efforts.

Economics

(26) Food Allergies and Their Effects on Grocery Price Disparities and Purchasing Patterns
Connor Kresock*
Mentor: Rivin Perinchery, Economics
Through quantitative methods, this research identifies the price disparity between conventional food goods and their allergy-friendly counterparts. Preliminary results indicate that there is a statistically significant price increase from conventional foods to allergy-friendly ones. We explore how this price disparity impacts household financials and consumption patterns

Electrical Engineering

(27) Use of Atomic Force Microscopy and Ellipsometry to Confirm Thickness Measurements of Sputter-Deposited SiO2 Thin Films
Vladimir Lagutin*
Mentor: Sean Johnson, Electrical and Computer Engineering
Atomic Force Microscopy (AFM) and Ellipsometry were used to confirm thickness measurements of an SiO2 sputter deposition onto an Si/SiO2 wafer. Ellipsometry rendered pre-deposition and post-deposition SiO2 thickness to be ~275 and ~367 nm respectively, estimating a ~92 nm deposition. AFM confirmed the results, demonstrating strong agreement between the methods.

Exercise Science

(28) Pilot Data: Respiratory Exchange Ratio Predicts Perceived Exertion During Graded Maximal Exercise Testing
Madison Danser*, Katelyn Combs, Johan Schwartz, & Colin Carriker
Mentor: Colin Carriker, Health and Human Performance
This pilot study examined whether respiratory exchange ratio can estimate the rate of perceived exertion during graded maximal exercise. Respiratory exchange ratio was strongly and positively associated with perceived exertion across submaximal to maximal intensities, suggesting metabolic data may help verify physiological strain during exercise testing.

(29 The Relationship of Anthropometric Measurements and Central Hemodynamics, such as Pulse Wave Velocity
Zaria Owens*, Nick Sorensen, Adam Berrones, Brad Fleenor, Mark Abel, & Jason Keeler
Mentor: Jason Keeler, Health and Human Performance
To test the associations of PWV, aSBP, and aDBP with anthropometric measurements, including body mass, body mass index (BMI), body fat mass, percent body fat (BF%), lean mass, lean mass percent (LM%), fat to lean mass ratio (FLR), waist circumference (WC), hip circumference (HC), and waist to hip ratio (WHR).

(30) Supine Resting Hemodynamics are Unchanged by Anticipation of Same-day Exercise
Johan Schwartz*, Madison Danser, Katelyn Combs, & Colin Carriker
Mentor: Colin Carriker, Health and Human Performance
This study examined whether anticipation of same-day exercise influences resting hemodynamic measures. Brachial and central blood pressure, heart rate, and pulse wave velocity were unaffected when preceded by 15 minutes of supine rest. Same-day baseline resting variables can be meaningfully assessed after supine rest on both exercise and non-exercise days.

(31) Retrospective Analysis Of The Relationship Between Antioxidant Consumption And Arterial Stiffness In Law Enforcement Officers (LEOs)
Nick Sorensen*
Mentor: Jason Keeler, Health and Human Performance
LEOs are predisposed to cardiovascular disease (CVD), with increased oxidative stress being a known contributor to CVD. This study aimed to explore if arterial stiffness in LEOs was associated with estimated antioxidant consumption. There was no significant relationship between the investigated antioxidants and arterial stiffness in LEOs.

Forensic Psychology

(33) Effects of Mood on Perceptions of Facial Trustworthiness in an Ambiguous Crime Context
Laney Schenher* & Brianna Tyler
Mentor: Kelly Curtis, Psychology
This study examined how mood influences perceptions of facial trustworthiness. In a 3 x 2 between-subjects design, participants experienced a brief mood induction before reading an ambiguous crime vignette. Participants rated a picture of a face based on perceived guilt and trustworthiness with facial symmetry controlled as a covariant.

Health and Human Performance

(34) Lanifibranor Alters BCAA Metabolism In C2C12 Myotubes
Kipton Travis*, Alexa Klein*, Kayla Ragland, Macey McGovern, & John Michael Zimmerman
Mentors: Roger Vaughan, Exercise Science; Pamela Lundin, Chemistry
Peroxisome proliferator-activated receptors (PPARs) are key regulators of cellular metabolism, yet their effects in skeletal muscle remain under-investigated. Using C2C12 myotubes, this study examined lanifibranor, a pan-PPAR agonist. Lanifibranor increased mitochondrial function and content, enhanced BCKDH phosphorylation, and elevated extracellular BCAA levels, indicating metabolic remodeling in skeletal muscle.

(35) Creatine Does Not Alter Skeletal Muscle BCAA Metabolism
John Michael Zimmerman*, Gabriela Lowe*, Alexa Klein, Kipton Travis, & Roger Vaughan
Mentor: Roger Vaughan, Health and Human Performance
Creatine is widely used to enhance muscle performance, yet the effect of creatine on BCAA metabolism remains unclear. C2C12 myotubes were treated with creatine and BCAA metabolic gene and protein expression were assessed via qRT-PCR and Western blot, respectively. Neither gene nor protein expression were affected by creatine.

Honors

(36) Before the First Bite
Natalie Beronio*, Jayme Erdtmann*, Margaret Garr*, & McKenna Ulmer*
Mentor: Jay Putnam, Theatre
Our research assesses the effects of color intensity on flavor perception. This study examines how color intensity affects perceived flavor. 36 adults tasted four foods with four color intensities throughout our experiment, and rated appearance and taste. Ongoing results suggest stronger color may lead to stronger perceived flavor, clarifying conflicting findings about color effects.

(37) Food Mapping in the Triad Area
Anyia Brooks-Manning*, Nathan Brent*, Natalie Jensen*, & Ryan Monroe*
Mentor: Silvana Rosenfeld, Anthropology
This study maps immigrant-owned restaurants and ethnic grocery stores in Piedmont Triad to evaluate their impact on food access, dietary diversity, and community sustainability. Using surveys, interviews, and spatial analysis, it examines how migration, acculturation, and fusion cuisine reshape local food environments and influence health, identity, and economic development.

(38) The Relationship Between Neuromodulatory Beverage Consumption, Risk-Taking Behavior, and Socioeconomic Status:
Michael Galla*, Tyler Meadows*, Larissa Paddock*, & Bella Smith*
Mentor: Pamela Lundin, Chemistry
This study examines the possible relationship between socioeconomic status (SES), alcohol and caffeine consumption, and risk-taking behavior using data collected through a survey and two behavioral tasks. By expanding beyond traditional physical health perspectives on substance consumption, this research may inform public health officials, policymakers, and nonprofits serving lower-SES populations.

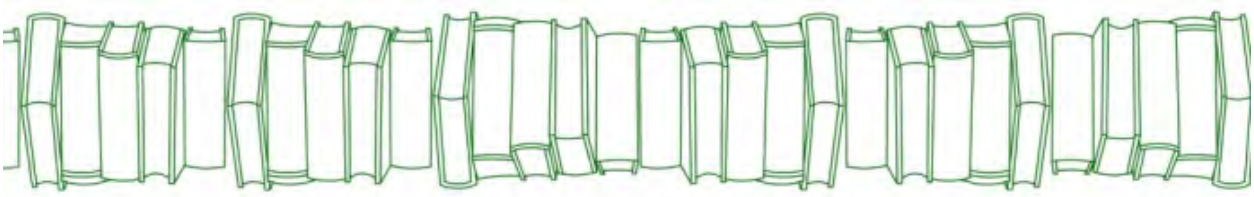
Interior Design

(39) Workplace Design Strategies for the Modern Legal Workplace
Hailey Coggs*
Mentor: Jane Nichols, Interior Design
NEXT is a Downtown Los Angeles law firm rooted in inclusion, focused research, and client service. Hybrid conference spaces support collaboration with remote partners. ADA-compliant design, group seating, and open workstations promote accessibility, while task lighting, acoustic treatments, industrial finishes, sophisticated colors, and biophilic elements enhance overall comfort and productivity.

(40) Next Law Firm Breaks Out of the Box and Moves into the Forest
Alyssa Ruland*
Mentor: Jane Nichols, Interior Design
The Next Law Firm breaks away from traditional office design with a nature-inspired concept. Featuring a neutral palette, rich textures, ambient lighting, vines, dark woods, and botanical patterns, the space evokes a calming, forest-like atmosphere. This bespoke design fosters creativity and offers a rejuvenating environment for both employees and clients.

Medical Sciences

(41) The Effects of Peppermint Extract on the Growth of Streptococcus Pneumoniae
Moorea Barbee*
Mentor: Tahl Zimmerman, Physician Assistant Studies
We aim to identify an antimicrobial for bacterium, *Strepptoccus Pneumoniae* using a polyphenol-rich peppermint extract. Using a 30g tea/30ml of water ratio, we are comparing bacterial growth with extract to the bacterial growth via OD levels, expecting the peppermint-treated bacteria growth curve to peak slightly after the bacteria culture.



Neuroscience

(42) Before the Bump: Exploring the Role of Dehydration Prior to Receiving a Mild TBI on Long-Evan Rats

Isabella Frankovic*, Alexandra Shutters*, Harlie Culbreth, Catherine Angeles, & Macy Schmelzer

Mentor: Bill Kochen, Neuroscience

Combat athletes often dehydrate to meet weight classes, potentially increasing vulnerability to mild traumatic brain injury (mTBI). Using 70 Long-Evans rats across dehydration and mTBI groups, this study evaluates behavioral and biological effects. Preliminary analyses show interactions among dehydration, injury, and sex, suggesting dehydration may worsen mTBI outcomes severity.

(43) Neuroprotective Qualities Of Penicillium Antarcticum On PC-12 Cells

Alexis McCue* & Michael Grider

Mentor: Michael Grider, Neuroscience

We analyzed the neuroprotective qualities of a fungal extract, *Penicillium Antarcticum*, after injury with 100mM H_2O_2 (hydrogen peroxide). It was found that there is a significant increase in cell viability when treated, compared with the control. Our next goals include reducing variability in experimentation as well as enhancing neuronal survival.

(44) Acoustic Modulation of Cellular Activity Through Controlled Sound Exposure

Syd Ryan*

Mentor: Michael Grider, Neuroscience

This study examines whether controlled acoustic stimulation alters cellular function. Cells are exposed to calibrated sound in a sound-attenuated chamber. Cellular responses are assessed through metabolic viability assays, flow cytometry, and inflammatory gene expression to evaluate whether acoustic stimulation influences viability, differentiation, or inflammatory signaling pathways.

Philosophy

(45) The Philosopher King: Contemporary Applications on Leadership Ethics

Ash Appel*, Rachel Grise*, Ariel Howard*, Ben Mathews, & Nate Smith*

Mentor: Amy MacArthur & Thaddeus Ostrowski, Philosophy

Plato's Republic defines ideal leadership being modeled by a 'Philosopher King' applying wisdom, courage, and temperance to achieve justice. The 2026 NCICU Ethics Bowl put forward various case studies in leadership, and our team presented how these ethics of ideal leadership could be applied in less-than-ideal scenarios.

Physical Therapy

(46) Reduced Alpha Power Associated with Impaired Dual-Task Standing Performance in Older Adults with MCI

Helia Osareh*, Brad Manor, & Melike Kahya
Mentor: Melike Kahya, Physical Therapy

Older adults with mild cognitive impairment (MCI) struggle with standing balance during dual-tasking. EEG showed reduced alpha power compared to controls, especially in central right and anterior left regions. Lower alpha power correlated with increased postural sway, suggesting worse dual-task standing performance in adults with MCI.

Physics

(47) Utilizing Rheology to Explore the Adhesive Properties of Bacterial Biofilm on Medical Devices

Aubrey Fessler* & Caitlyn Winegeart
Mentor: Jacob Brooks and Briana Fiser, Physics and Astronomy

Methicillin-resistant *Staphylococcus aureus* (MRSA) causes hospital-acquired infections by forming bacterial biofilms on medical devices. Using a rheometer, we are able to study the viscoelastic properties of the USA100 strain grown under static and flow conditions to better understand biofilm adhesion and inform future strategies to reduce biofilm attachment and proliferation.

(48) Greyscale Photolithography for Geometric Surface Design

Megan Mueller*
Mentor: Jacob Brooks, Physics and Astronomy

Grayscale photolithography enables dose-controlled patterning of photoresist to produce continuous 3D microtopographies unattainable with binary lithography. We defined surfaces mathematically, patterned photoresist, and analyzed the products with scanning electron microscopy (SEM). Preliminary results demonstrate strong control over surface patterning, though process refinement is ongoing. These surfaces have superhydrophobic applications.

(49) Textured PDMS Surfaces: A Promising Approach to Biofilm Prevention

Caitlyn Wingeart*, Aubrey Fessler, & Megan Mueller
Mentors: Jacob Brooks & Briana Fiser, Physics and Astronomy; Meghan Blackledge, Chemistry

Bacterial and fungal biofilms threaten human health, increasing morbidity, and healthcare costs. We engineered micro-textured surfaces to resist microbial attachment using varied feature size and spacing. Photolithography produced silicon molds for polydimethylsiloxane stamps, enabling a parametric study of surface geometry's role in biofilm prevention and guiding future surface design.

Psychology

(51) Evaluating Study Strategy Beliefs and Usage in Middle School Teachers
Lily Grace Foister*, Genevieve Schultz*, Catherine Gallagher*, Jessamina Piazza*, Caitlin McCray, Contessa Kim, & Kellie Langa
Mentor: Stacy Lipowski, Psychology
Research suggests teachers hold misconceptions regarding study strategies, potentially resulting in a negative impact on students (Lieder et al., 2023). This study examined middle school teachers' beliefs about study strategies through surveys and interviews. Results regarding teachers' beliefs and how strategies are taught in the classroom will be shared.

(52) Math, Writing, and Cognitive Profiles in Past and Present Student-Athletes
Jackson Jones*, Brooke Kozak*, & Arielle McPhee*
Mentor: Daniel Krenzer, Psychology
This study examines math and writing fluency skills in college students that have sport experience. Academic, cognition, and brain wave data were analyzed to identify patterns of strength and weakness based on sport played (contact or non-contact sport) through MoCA, EEG, and Trail Making data.

(53) The Effects of Feature Diagnosticity on Color-Concept Association Formation
Ciera Pellicciotta*
Mentor: Melissa Schoenlein**,** Psychology
This study explores how associations between colors and objects are influenced by diagnosticity (distinctiveness) of an object's visual features. Participants categorized novel flowers with features (petals/stems/centers) varying in diagnosticity. Then, they rated their associations for each features' color. Results show that color-concept association strength is influenced by diagnosticity.

(54) ADHD: Reading, EEG, and Cognitive Differences
Eva Richardson*
Mentor: Daniel Krenzer, Psychology
Prevalence of ADHD has increased in recent years. It is accepted that ADHD may impact focus, concentration, and reading. This study focuses on EEG data and reading performance between those with and without ADHD. Preliminary results reveal that ADHD may impact reading fluency.

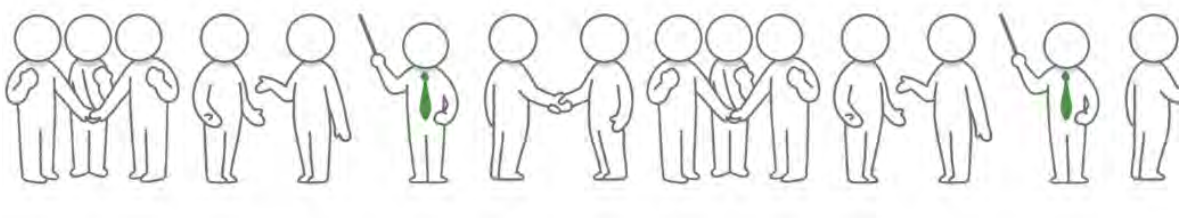
(55) Hidden Influences: The Role of Childhood Trauma in Academic Engagement, Integrity, and Performance Among College Students
Leland Sanders*
Mentor: Kirsten Li-Barber, Psychology
This study examines how childhood trauma exposure relates to academic engagement, study behaviors, integrity, and performance among college students. Overall, results found that there were no significant relationships observed among the variables examined. Future research using a larger or more diverse sample may be necessary to further evaluate potential associations.

(56) Accent Bias In The Courtroom
Brianna Tyler* & Laney Schenher
Mentor: Kelly Curtis, Psychology
This study examines how regional accents affect perceptions of witness credibility. Participants listened to expert testimony delivered with a Boston, New York, Southern and neutral accent then proceeded to rate their level of credibility. The findings explore how familiarity and attitudes towards these accents shape credibility judgments.

(57) Contact and Non-Contact Sports; Measuring Athletes' Cognitive and Academic Skills
Sophie MacDonald* & Kat Karwoski*
Mentor: Daniel Krenzer, Psychology
This study examines the impact of athletic experience on academic and cognitive performance in students that played sport in high school or at the collegiate-level. Those involved in contact and non-contact sports were shown to have varied academic and cognitive (e.g., EEG & executive functioning) profiles based on collected data.

Strategic Communications

(58) Exploring US Teens Perceptions of Climate Consensus
Abby Elburn*
Mentor: Sarah Vaala, Strategic Communications
As causes and impacts of climate change are explored by scientists, teens are exposed to media regarding the issue. This research explores US teens' perceptions of scientists' and peers' consensus about human-caused climate change, and how those perceptions correlate with teens' own beliefs, climate anxiety, and pro-environmental behavioral intentions.



Technical Exhibits II

2nd floor Concourse (Hallway)

10:30 pm – 11:45 pm

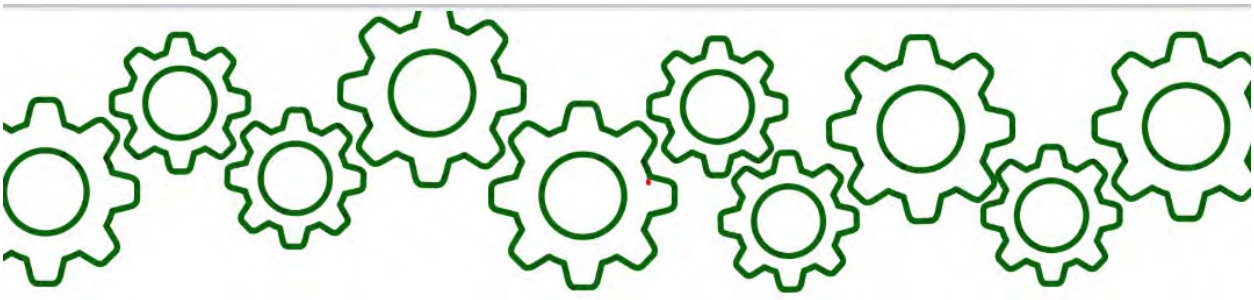
Game Design

(59) ***Recompile***
Amaris Jenkins*
Mentor: Brian Heagney, Game Design
Recompile is about a girl who is put within a computer program by her best friend in order to save her. Due to complications, however, the game is very faulty and is destroying her from the inside out. What will you do?

(60) ***MY BFF's BOYFRIEND***
Ashley Poteat*, Mark Metcalf* & Sally Purrington
Mentor: Brian Heagney, Game Design
Tiffany wakes up to her BFF's boyfriend in her bed, killing him in the heat of the moment. After the carnage, she'll have to dismember and hide the body before her BFF comes to her apartment…in 6 minutes!

Computer Science

(61) ***An Open-Source Malware Sandbox with Data Sovereignty and LLM-Powered Dual-Audience Reporting***
Amir Hamidpour*
Mentor: Kedrian James, Computer Science
This research develops an enhanced CAPEv2 malware sandbox providing complete data sovereignty for privacy-sensitive organizations. The system extends open-source capabilities with OCR-based phishing detection and integrates LLM technology to auto-generate dual-audience security reports, addressing HIPAA/GDPR compliance requirements while democratizing advanced threat analysis.



Vocal and Musical Performances

Premiere Ballroom 2202 G

10:45 a.m. – 11:45 a.m.

Percussion/Media Presentation

PASIC 2026

Finnigan Gilbert*, Andrew Porter*, Joseph Umina* & Marc Delgallo*

Mentor: Louis Raymond-Kolker, Music

Select students from the Percussion Studio traveled to Indianapolis in November to perform at the Percussive Arts Society International Convention. They participated in a new music and research concert, performed in the largest presentation of Inuksuit, and competed in the Timpani Individual and Ensemble competition, representing their program internationally.

Vocals

I Cain't Say No

Alexa Beck*

Mentor: Jaclyn Surso, Music

"I Cain't Say No" is sung by the comedic Ado Annie in *Oklahoma!*, a Rodgers and Hammerstein musical. This song is about how Ado Annie cannot choose between the two men she likes. I performed this piece at the National Association of Teachers Singing (NATS) competition.

Stars

Quinn Fergusson*

Mentor: Jacyln Surso, Music

I will perform "Stars" from the 1985 musical *Les Misérables*, by Claude-Michel Schönberg, Herbert Kretzmer, and Alain Boubil. This is one of four songs I performed at the National Association of Teachers of Singing competition in fall at UNC Charlotte, after working on it with my mentor and an accompanist.

Never Fall in Love with an Elf

Daniel Hoecker*

Mentor: Jaclyn Surso, Music

"Never Fall in Love with an Elf" A quietly transformative Act Two moments, this song captures the precise instant a self-proclaimed cynic realizes her walls have come down without permission. Jovi isn't just singing about a missed date; she's singing about the terrifying inconvenience of being changed by someone you never expected to love.

Still Hurting
Daniel Hoecker*
Mentor: Jaclyn Surso, Music
"Still Hurting" Dropping us directly into wreckage, this opening number establishes the show's devastating conceit immediately: the relationship is already over. What makes it so quietly crushing is not the loss itself, but how Cathy experiences it. Slowly, in real time, on an ordinary day before we've even witnessed the joy.

In My Dreams from Anastasia
Tessa Lamb*
Mentor: Jaclyn Surso, Music
This song is a piece that I got the opportunity to perform at NATS (National Association of Teachers of Singing) at UNCC. In a competition to showcase my voice and get feedback on songs that I would later be performing in my senior recital**.**

'She Used to Be Mine' by Sarah Bareillis
Ella Marron*
Mentor: Jaclyn Surso, Music
November 15th, I traveled to the University of North Carolina Charlotte to compete in the National Association of Teachers of Singing under Jaclyn Surso's mentoring, where I scored high enough in my division to pass through to the next round—regionally.

Goodbye, Little Dream, Goodbye
Ashley Mullens*
Mentor: Jaclyn Surso, Music
This presentation features my performance of "Goodbye, Little Dream, Goodbye" by Cole Porter from the musical Anything Goes at the Regional National Association of Teachers of Singing (NATS) competition. This piece highlights a wide range of techniques and acting skills and helps me further develop as a vocalist.

I Don't Need a Roof
Ashley Mullens*
Mentor: Jaclyn Surso, Music
This presentation features my performance of "I Don't Need a Roof" by Andrew Lippa from the musical Big Fish at the National Association of Teachers of Singing (NATS) competition. This piece highlights technique and acting. My performance qualified me to advance from the state competition for the regional competition.

Good Girl
Madeleine Rubino*
Mentor: Jaclyn Surso, Music
I will be presenting a song titled "Good Girl", originally published by Carrie Underwood, that was performed at the National Association of Teachers of Singing competition on November 7th, 2025. This fall, I prepared multiple pieces for the competition. I received feedback on my performance from professional musicians.

In The Kitchen
Madeleine Rubino*
Mentor: Jaclyn Surso, Music
I performed "In the Kitchen", originally published by Renee Rapp, at the National Association of Teachers of Singing competition on March 1st, 2026. This spring, I prepared multiple pieces for the competition. I received feedback on my performance from professional musicians.

What I Did for Love
Gabriella Vitelli*
Mentor: Jaclyn Surso, Music
I performed "What I Did for Love" from the Broadway musical *A Chorus Line*, composed by Marvin Hamlisch with lyrics by Edward Kleban. I performed this virtually at the National Association of Teachers of Singing competition in the spring taking place at the University of Maryland. I worked on the piece with the help of my voice teacher and a live accompanist during my lessons to refine my vocal technique, interpretation, and overall performance of the song.

Journey to the Past
Gabriella Vitelli*
Mentor: Jacyln Surso, Music
I will be performing "Journey to the Past" from the Broadway musical Anastasia, composed by Stephen Flaherty with lyrics by Lynn Ahrens. I performed this virtually at the National Association of Teachers of Singing competition in the fall at UNC Charlotte, where I will receive feedback from professional musicians during the event. I will be working on the piece with the help of my voice teacher and a live accompanist during my lessons to refine my technique, interpretation, and performance of the song.

My Days
Alyssa Vogt*
Mentor: Jaclyn Surso, Music
I will perform "My Days" from *The Notebook*: *The Musical* with music and lyrics by Ingrid Michaelson. This is one of the 4 songs I performed for the state competition of The National Association of Teachers of Singing. I placed third and got notes from professional musicians to help me improve.

You Don't Know This Man
Alyssa Vogt*
Mentor: Jaclyn Surso, Music
I will perform "You Don't Know This Man" from Parade with music and lyrics by Jason Robert Brown. This is one of 4 songs I performed for the Regional competition for NATS. My performance at the state level allowed me to progress to this level of the competition.

Wait My Turn
Pulled
Hailey White*
Mentor: Jaclyn Surso and Ken Davis, Music
I performed at NATS. I moved on to Regionals then Nationals. I am performing "Wait my Turn" by Shaina Taub from *Suffs* and "Pulled" from *The Addams Family*.

Oral Presentations

Oral Session II: 11:45 am – 1:15 pm

Data Science and Computer Science **Room A**

11:45 – 12:00

Predicting Post-COVID Office Vacancy Risk in U.S. Metropolitan Areas Using Machine Learning Models

Jack Jaramillo*

Mentor: Luis Cueva Parra, Computer Science

This study identifies U.S. metropolitan areas most vulnerable to post-COVID office vacancy risk. Using a panel dataset of metropolitan areas and multiple machine learning classification models, the research evaluates economic and demographic indicators associated with elevated office market risk and provides a framework for assessing post-pandemic office demand vulnerability.

12:00 – 12:15

Neural Network-Based Signal Classification for Algorithmic Trading

Jeffrey Andreski Jr.*

Mentor: Luis Cueva Parra, Computer Science

This project explores neural networks for generating trading signals using historical stock market data. Engineered features such as returns, moving averages, and volatility are used as model inputs. The system classifies market conditions into buy, sell, or hold signals and evaluates performance using machine learning and financial risk metrics.

12:15 – 12:30

Type Inference for Legacy COBOL on System/370

Isaac Denny*

Mentor: Kedrian James, Computer Science

Open-source tooling for IBM mainframes remains limited. This paper reviews x86/x64 type inference techniques and applies a four-stage framework to infer COBOL types from System/370 binaries: naive control flow analysis, binary dependence analysis, deterministic rules, and a probabilistic ruleset layer to resolve inference conflicts.

12:30 – 12:45

Predicting Protein Function Using Machine Learning and Protein Language Model Embeddings

Quinn Ramsay*

Mentor: Luis Cueva Parra, Computer Science

Predicting protein function from amino acid sequences is an important problem in computational biology. This project develops a machine learning pipeline that predicts Gene Ontology terms using ESM-2 and ProtT5 embeddings with XGBoost and neural network models. Nine prediction pipelines are evaluated to compare embedding and model effectiveness.

11:45 – 12:00

Public Attitudes Towards The Supreme Court in a Highly Polarized Political Arena

Anja Carlmark*

Mentors: Mark Setzler & Gordon Ballingrud, Political Science

In recent years, public support for the US Supreme Court has plummeted. The political balance on the Court has changed, and it has reversed itself on various high-profile issues. I analyze Pew Research Center data to explain how gender, age, race, income, education, and party alignment shape perceptions of the new Court.

12:00 – 12:15

How Civic Are Religious "Nones" in America?

Nathan Lattimore*

Mentor: Mark Setzler, Political Science

This study investigates whether residual religious exposure continues to shape civic engagement and trust in political institutions among the religiously unaffiliated, or "nones". These residual practices include limited exposure to religion through occasional prayer, infrequent attendance, or assigning some personal importance to religion.

12:15 – 12:30

Authoritarianism Populism, National Belonging, and Identity in Latin America

Sophia Pipta*

Mentors: Mark Setzler, Political Science; Samuel Whitt, International Relations

In Latin America, belonging has shifted from legal status to ideological alignment. Through exclusionary rhetoric, Brazil's Bolsonaro and Argentina's Milei redefine national identity via cultural nationalism and traditionalism. Despite different ideologies, right-wing populist versus radical libertarianism, both leaders utilize populist narratives to marginalize dissenters, framing "true" citizenship as loyalty to specific conservative or anti-establishment values.

12:30 – 12:45

Who Supports Technocracy? Examining American Attitudes Toward Expert-Led Governance

Trinity Stigler*

Mentors: Mark Setzler & Gordon Ballingrud, Political Science

Partisan gridlock and declining public trust in democratic institutions have raised questions about alternative forms of governance. This study analyzes American attitudes toward technocracy using logistic regression to identify predictors of support for expert-led governance. Results show support is higher among younger individuals, minorities, women, low-income respondents, and those pessimistic about the economy.

Sociology, Anthropology, and Religion — Room C

11:45 – 12:00
Lost Settlements of South Abaco
Luke Prosa*
Mentor: Matthew Sayre, Sociology and Anthropology
Abaco, the northernmost island of the Bahamas, has seen many waves of habitation throughout its history. This presentation covers how I've begun to piece together the unknown portions of Abaconian history, through newspaper archives, survey maps, birth and death records, and a bit of Sunday afternoon archaeology.

12:00 – 12:15
Crossroads of Care: Examining the Effects of Cultural Stressors and Biomedical Advice on Breastfeeding Choices Among Women Living with HIV in Botswana
Cameron Siler-Nixon*
Mentor: Taylor Van Doren, Sociology and Anthropology
In Botswana, a high HIV-prevalence country, women occupy a contested space between feeding practices shaped by policy changes and HIV-related stigma. This mixed-methods study employs a critical medical anthropological approach to examine the impact of cultural stressors and changing biomedical standards on feeding decisions among Batswana women living with HIV.

12:15 – 12:30
The Theoretical and Practical Convergence of Colonial European Christianity and Cherokee Religion on the North American Continent
Ivy Scott*
Mentor: Robert Moses, Religion
This paper examines how beliefs about creation, end of life, and property influenced the convergence of colonial European Christianity and Cherokee religion. By exploring how each party related to nature, whether through dominion, stewardship, or interconnectedness, one can observe how theoretically compatible ideals clashed when it came to practice.

French and History — Room D

11:45 – 12:00
Catholicisme et mysticisme : une religion unique en Martinique représentée dans Texaco de Patrick Chamoiseau
Shelby Caruso*
Mentor: Denis Dépinoy, French
An academic paper reviewing religions in French Martinique through the lens of Patrick Chamoiseau's novel Texaco. Catholicism is the primary religion of Martinique, but it is blended with elements of Mysticism. In this reflection, the reader can see instances in Texaco when both religions merge to form one unique belief.

12:00 – 12:15
"Of Zheal and Fervor", The role of Franciscans in the indigenous population decline of Mexico
Colton Marion*
Mentor: Amanda Allen, History
This research argues that the Franciscan Mendicant order contributed more to the Indigenous population decline within Colonial Spanish America than we have originally thought. This is proven through the development of the Order throughout the conquest and in the assimilation and Hispanization of Mestizo groups.

12:15 – 12:30
Exploitation, Cooperation, and Fighting for Survival: British-Māori Cultural Interactions in 19th-Century New Zealand
Quinn Fergusson*
Mentor: Amanda Allen, History
This paper examines interactions between indigenous Māori and British settlers during the nineteenth-century colonization of New Zealand. This paper argues that New Zealand's colonization was not characterized by Māori submission, but by cooperation with and resistance to their oppressors.

English II — Room E

11:45 – 12:00
Power, Deception, and Gender in The Maltese Falcon
Owen Newcombe*
Mentor: Matthew Carlson, English
In *The Maltese Falcon*, Dashiell Hammett portrays gendered social expectations through his detective, Sam Spade, and the femme fatale, Brigid O'Shaughnessy. This presentation shows how gender roles serve as survival tactics in the novel, which reflects the cultural anxiety surrounding the perceived decline of the patriarchy in 1920s America.

12:00 – 12:15
Morality and Identity: Cordelia Gray & Ezekiel "Easy" Rawlins
Jessie Steinbaugh*
Mentor: Matthew Carlson, English
Using existential theory, this presentation shows how fictional detectives Cordelia Gray (in P. D. James' *An Unsuitable Job for a Woman*) and Ezekiel "Easy" Rawlins (in Walter Mosley's *Devil in a Blue Dress)* confront oppressive structures, define their own personal moral responsibilities, and discover meaning outside of predetermined notions.

12:15 – 12:30
Thou Shalt Kill; The Religious Dimension of Detective Fiction
Ashley Mullens*
Mentor: Mathew Carlson, English
This presentation analyzes works by Agatha Christie and Dashiell Hammett to show how mystery subgenres parallel Old and New Testament theology. While Golden Age detectives operate in a world of clear commandments, the hard-boiled detective becomes an ironic Christ figure who takes on sinfulness as he determines innocence and guilt.

12:30 – 12:45
Ethical Failure in The Devotion of Suspect X
Allie Fitzpatrick*
Mentor: Matthew Carlson, English
Keigo Higashino's *The Devotion of Suspect X* challenges traditional detective fiction by demonstrating that intelligence alone cannot guarantee justice. By contrasting Tetsuya Ishigami's moral blindness with Manabu Yukawa's empathy-grounded intellect, Higashino argues that effective detective work requires both analytical brilliance and ethical reasoning to uncover meaningful truth.

12:45 – 1:00
The Bildungsroman of Displacement and Ambivalence in Kincaid's Lucy
Madison Molis*
Mentor: Joshua Bartlett, English
This paper analyzes Jamaica Kincaid's Lucy as a postcolonial reimagining of the European bildungsroman. Drawing on Kaisa Ilmonen, it argues that Lucy's alienation from her mother, homeland, and colonial education disrupts the genre's promise of reconciliation. Instead, Kincaid presents selfhood as unfinished, redefining growth as resistance and ongoing movement rather than resolution.

1:00 – 1:15
"My Past Was My Mother." The Mother and the Motherland in Lucy
Malia Agostinelli*
Mentor: Joshua Bartlett, English
This essay explores Jamaica Kincaid's novel, Lucy, through the figure of the mother as a personal and colonial symbol. Lucy strives to set boundaries and establish her own sense of belonging; however, in doing so, she becomes weighed down by her maternal past, further shaping her character.

Honors II — Room F

11:45 – 12:00
Is Food Really the Way to a Man's Heart?: The Role of Cooking in Romantic Attraction
Lilianna Allen*, Isabel Boyles*, Ryan Pitney*, & Ashley Smith*
Mentor: Stacy Lipowski, Psychology
The viral "Banana Bread Theory" suggests cooking enhances romantic attractiveness, yet empirical research on this remains scarce. This study investigates whether cooking performance influences perceived romantic attractiveness. As cooking could signal valued mate qualities such as warmth, provision, and competence; understanding its role advances scientific knowledge of human relationship formation and partner selection.

12:00 – 12:15

Feeding the Prison Cycle: Exploring the Impact Of Prison Food On Well-Being And Recidivism Rates

Paul Cusumano*, Ethan Boufahreddin*, Connor Hackett*, & Demetrio Lukaitis*

Mentor: Stacy Lipowski, Psychology

With 2 million incarcerated Americans and high recidivism rates, prison food serves as a tool for behavioral control. This mixed-methods study investigates how poor nutrition correlates with health and re-entry to prison. Improving institutional food practices is essential to support inmate well-being and reduce the cycle of reincarceration.

12:15 – 12:30

Americanization Of Cultural Foods

Emily Bollinger*, Dominic Desideriosciolli*, Caitlin Enright*, & Arianna Ording*

Mentor: Stacy Lipowski, Psychology

This study examines how ethnic cuisines adapt to fit American tastes and gain social acceptance. Through restaurant visits in the wider High Point area, patron surveys, and owner interviews, we analyze perceptions of authenticity and how Americanization reshapes ingredients, preparation, and cultural identity within mainstream food culture.

12:30 – 12:45

Bytes and Bites: How AI Chatbots Support College Students' Eating Habits During Stress

Lily Bruner*, Caroline Stuart*, Trint Saunders*, & Maddie Erwin*

Mentor: Timothy O'Keefe, English

"Bytes and Bites" investigates the relationship between student stress, eating behaviors, and a willingness to adopt personalized AI chatbots. The research identifies AI accuracy gaps and evaluates if personalized meal recommendations can reduce stress by alleviating the mental load of daily food-related decision-making.

12:45 – 1:00

From Breadlines to Bread Tok: Food Messaging in Two American Crises

Emily Horne*, Chase Hofmann*, Julianna Lubeck*, & Reid Wheeler*

Mentor: Jay Putnam, Theater and Dance

A qualitative study that compares food messaging in the United States between the Great Depression and the COVID-19 pandemic by analyzing and coding advertisements, recipes, cookbooks, and digital media across both periods. Findings highlight and analyze the changing cultural priorities surrounding affordability, health, and public behavior.

Poster Session III

2nd Floor Concourse (Hallway)

12:45 p.m. – 2:00 p.m.

Biochemistry

(1) PET Plastic Degradation Over Varied Temperatures

Madison Burnett*, Abbigail Locklear*, & Joely Pepe*

Mentor: Kelsey Kean, Chemistry

Plastic pollution continues to increase as common plastics like PET (polyethylene-terephthalate) accumulate in landfills and our environment. Since recycling rates are continuing to remain low, alternative solutions are very important. This project studies FAST PETase, an enzyme capable of degrading PET, to evaluate its potential role in reducing plastic waste.

(2) From Waste to Wasteless: Turbo PETase and the Future of Recycling

Aubrey Durham* & CJ Gulla*

Mentor: Kelsey Kean, Chemistry

Polyethylene terephthalate (PET) is one of the most abundantly produced plastics with over 80 million tons produced annually. Turbo PETase is an enzyme that catalyzes the breakdown of PET plastic. We characterized Turbo PETase, providing insights into its potential for plastic degradation and contributing to sustainable waste management solutions.

***(3)* Efflux Inhibition in MRSA Using Loratadine**

Bryce Grier*

Mentor: Heather Miller, Biochemistry

Loratadine reduces efflux activity in MRSA, increasing intracellular ethidium bromide (EtBr) fluorescence. Efflux assays showed enhanced EtBr retention, indicating pump inhibition. The stk1 mutant showed similar effects, suggesting Stk1 is not required. Accumulation assays indicate loratadine may also increase influx, supporting its role as an antibiotic adjuvant.

(4) Depolymerization of PET by PETase

Caitlin Michaelis*, Koby Mante*, & Jacob Dening*

Mentor: Kelsey Kean, Chemistry

PET is a common plastic used in everyday items around the world, however, it's not easily biodegradable, causing many issues with waste. The enzyme PETase was discovered to catalyze the depolymerization of PET. This project researches the power of PETase and how it can be used to reduce plastic pollution.

(5) Identifying the Interaction of Compound 8 with MRSA Proteins Through Affinity-Based Protein Purification

Logan Rampetsreiter*, Gabriel Valenzano, Meghan Blackledge, & Heather Miller

Mentor: Heather Miller, Chemistry

Methicillin-resistant Staphylococcus aureus (MRSA) has developed resistance to multiple antibiotics. Our study aims to identify the protein interaction of a brominated carbazole that reduces antibiotic resistance. Previous findings theorize serine/threonine kinase 1 (STK1) as the adjuvant target. Using protein purification techniques, we want to determine the adjuvant target in MRSA.

(6) Optimal Concentration of PETase to Degrade PET Plastic
Sierra Werner*, Julia Matachun*, & Lindsay White*
Mentor: Kelsey Kean, Biology
Over 56 million tons of PET(polyethylene-terephthalate) are produced each year. 70% of that becomes plastic waste, causing major pollution in the environment. A recently discovered enzyme, FAST-PETase, can degrade PET. Our research aims to find the best concentration for degrading PET, supporting plastic reuse over polluting the environment.

Biology

(7) Inside NidoQ: Cracking the Genetic Code of an Actinobacteriophage
Brooke Aleman*, Kamauri Brown*, Elizabeth Harris*, Danielle Hinte*, Eleanor Lee*, Kylee Link, Logan Loller, Selah McAdams*, Kiyah Sherman*, Ellie Tejada, Haven Tucker, Dinene Crater, & Megan Bowman
Mentors: Megan Bowman & Dinene Crater, Biology
NidoQ, a siphoviridae FAcluster temperate actinobacteriophage, was isolated at High Point University (GPS coordinates: 35.97 N, 79.997 W), and infects Arthrobacter globiformis B2979. The genome is 42,564 bp, has a GC content of 65%, encodes 63 genes, and includes excise, tyrosine integrase, and immunity repressor genes.

(8) A Pathological Dinosaur Femur from the Late Triassic (Norian) of New Mexico
Laird (Hootie) Bickford*
Mentor: Josef Stiegler, Biology
An ontogenetic series of theropod dinosaur femora has been collected from the Late Triassic of New Mexico, pertaining to a new species of dinosaur. One femur is likely an adult based on muscle scar development. We CT scanned the femur to investigate a pathological growth on its posterior aspect.

(9) Effects of Wildfire on Soil Chemical Properties and Nutrient Availability
Youliana Hadgu*
Mentor: Dane Kuppinger, Biology
Wildfire can alter soil chemistry and nutrient availability, influencing ecosystem recovery. Soil samples from burned sites (B19, B21, B19+21) and an unburned reference site were analyzed. Because the data were not normally distributed, Kruskal–Wallis tests were used. Results identify differences in soil properties and provide insight into post-fire soil fertility recovery.

(10) Using Molecular Tools to Identify Bee Hotel Inhabitants and Their Usage of Local Floral Resources to Improve Pollinator Community Support.
Nicole Korczyk* & Ava Heaton
Mentors: Megan Bowman & Daniel Greene, Biology
Five bee hotels installed across HPU campus gardens were used to study the composition of solitary bee species occupying these structures and their nesting activity. DNA barcoding identified species within nesting chambers and floral
resources supporting developing larva. Future research will examine differences in
larval gene expression by birth order/sex.

(11) Fabricating Biofilm-Resistant Dental Appliances Based on Superhydrophobic Surfaces of Rose and Pansy Petals

Katie McDonald*

Mentor: Nicole Hughes, Biology

There is a growing interest in exploring physical, nano-scale mechanisms for water repellency. Such structures also prevent biofilm formation. For my research project I am examining the surface structures of two superhydrophobic flowers, specifically the Rosa sp. and Viola x wittrockiana using critical point drying and SEM images.

(12) Bacteriophage "ChipsNGuac" from Bacterial Host Arthrobacter globiformis Discovered in High Point, North Carolina

Nelia Kelleher*, Peyton McAuliffe*, Sydney Slater*, & Liliana Carroll*

Mentors: Dinene Crater & Megan Bowman, Biology

Environmental samples from High Point, North Carolina were enriched following SEA-PHAGES protocols to isolate bacteriophages infecting *Arthrobacter globiformis* B-2979. After purification to achieve a clonal population, DNA was extracted from phage lysate and analyzed using gel electrophoresis, and transmission electron microscopy, leading to the discovery of novel phage "ChipsNGuac".

(13) Binding of GerE to the Promoter Region of Spore Coat Genes in Bacillus Species

Tory Puharic* & Grace Heltzman*

Mentor: Dinene Crater, Biology

Bacillus subtilis undergoes sporulation under environmental stress through transcriptional regulation. Our research compares how the DNA-binding protein GerE interacts with sigma-K in different *Bacillus* species, including *Bacillus thuringiensis* and *Geobacillus stearothermophilus*. Insights from this work may ultimately be applied to understand sporulation pathways in other environmental conditions.

(14) Assessing Ecosystem Services in Native vs. Ornamental Botanical Gardens at High Point University

Ellie Ratta*, Brian Ragoobir*, Kara Vaartjes, Connor Spitler, & Imani Bascoe

Mentor: Megan Bowman, Biology

Ecosystem services are critical to the health of a garden. We compared two HPU gardens of similar size and plant diversity but varying significantly in terms of plant species identity – Native vs. Ornamental. Pitfall traps were used to collect epigeal arthropods while aerial nets were used to assess insect pollinators.

(15) The Fire History of Flat Shoals

Kayleigh Reardon* & Lauren Marra

Mentor: Dane Kuppinger, Biology

No fire history record exists for Hanging Rock State Park, limiting understand of fire's effects on forest structure. This research reconstructed a fire history using tree-ring fire scars. Results show fewer fires between 1920–1969 and more frequent fires after 1970. This research can inform future prescribed fire planning.

(16) A Novel Leaf Color Phenotype in the Semi-evergreen Swamp Laurel Oak, Quercus laurifolia

Kara Vaartjes*, Aubrey Church*, Nicole Hughes, & Megan Bowman
Mentor: Megan Bowman, Biology

Quercus laurifolia, is a semi-evergreen tree with yellow senescing leaves native to the Southeastern US. Why autumn hues differ between individuals and species remains poorly understood. Consistent with the hypothesis that cold temperatures drive leaf reddening, we observed red-leafed individuals in northernmost populations. Identification was verified using DNA barcoding.

(17) The Impact of Sound on Danio Rerio Reproduction

Colby Vullo*, Emma Ducharme*, & Imani Bascoe*
Mentor: Vernon Coffield, Biology

This study investigates the impact of underwater noise exposure on the reproductive fitness of zebrafish (Danio rerio) in controlled environments. By evaluating egg production, fertilization rates, and viability, we aim to determine the impact of environmental noise pollution on reproductive viability, offering valuable insight into aquatic ecosystem biology.

(18) Impact of Spectrally Filtered Light on Zebrafish Reproduction

Zachary Workman*, Alex Kaelin*, & Elizabeth Kelly*
Mentor: Neil Coffield, Biology

This study examines how ecologically relevant light filtration affects zebrafish (*Danio rerio*) reproduction using five spectral treatments with matched intensity controls. Evaluating embryo production and viability, we isolate color from shading effects to determine whether vegetative cover imposes hidden reproductive costs through spectral manipulation, informing aquatic habitat selection.

Chemistry

(19) Synthesis and Evaluation of Activity-Based Protein Purification Reagents

Aaliyah Coley*
Mentor: Meghan Blackledge, Chemistry

Carbazole derivatives are important in materials science and chemical biology because of their rigid aromatic structure and ability to be selectively functionalized.
This project explored installing an alkyne onto a 4-bromocarbazole scaffold for future click chemistry reactions. Both protected and unprotected alkynes formed intermediates, but the protected alkyne provided better reaction control,
highlighting the value of protection strategies in optimizing carbazole synthesis.

(20) Analysis of Degradation by FAST-PETase on PET

Garland Greene* & Gigi Orecchio
Mentor: Kelsey Kean, Chemistry

Polyethylene terephthalate (PET) is a widely used plastic that contributes significantly to global plastic waste. In this study, FAST-PETase was recombinantly expressed, purified, and evaluated for PET degradation. Activity was confirmed by pNPA assay, while PET degradation was analyzed using mass loss analysis, UV-Vis spectroscopy, and SEM, demonstrating measurable degradation influenced by enzyme concentration and buffer conditions.

(21) Synthesis and Evaluation of Antibiotic Adjuvants from Carbazole Scaffolds
Kaley LeFevre*
Mentor: Meghan Blackledge, Chemistry
To combat increasing antibiotic resistance levels, potential antibiotic adjuvants are synthesize by attaching an epoxide, using epichlorohydrin, to carbazole derivatives. Epoxide additio removes hydrogen bonding; ring opening with primary or secondary amines forms an alcohol restoring hydrogen bonding and solubility. Summer humidity causes reaction issues, prompting tested reaction variations.

(22) Loratadine Decreases Virulence of Methicillin-Resistant* Staphylococcus Aureus *Through the Disruption of Hemolysis
Isabel Marshall*, Emma Renee Monge, Maggy Henkel, Meghan Blackledge, & Heather Miller
Mentor: Heather Miller, Chemistry
Methicillin-resistant Staphylococcus aureus (MRSA) is a continued threat in hospital and community settings. MRSA relies on multiple virulence factors, including hemolysins (cytolytic toxins that lyse host red blood cells). Loratadine treatment reduced hemolysin mRNA levels in a human cell line infection model.

(23) Tuning Dye Properties Through Changing the Linker in Rhodamine B Dimers
Claire Taylor*, Sarah Czuba, Madison Hill, Keir Fogarty, & Pamela Lundin
Mentor: Pamela Lundin, Chemistry
Rhodamine B is a common clothing dye. When linked together to form a dimer, it has unique dual-fluorescent properties that may aid in applications like cancer diagnosis. The rhodamine B dimer with a diaminobenzene linker has been well studied, and this work looks at using a *trans*-cyclohexyldiamine as the linker.

Electrical Engineering

(24) Radio Frequency (RF) Sputtering of SiO_2 Thin Films for Buried Graphene Nanofabrication Applications
Sara Hamidpour*
Mentor: Sean Johnson, Engineering
This study investigated RF magnetron sputtering for SiO_2 deposition onto graphene. Parameters of 150W RF power and 8 minutes yielded a uniform ~21nm film, confirmed by ellipsometry and AFM. The results show RF sputtering as a precise and consistent method for dielectric layer deposition for future buried graphene nanofabrication processes.

Exercise Science

(25) Association between splenic contraction and changes in central hemodynamics
Justin Benton*, Mia Lozada*, & Jason Keeler
Mentor: Jason Keeler, Health and Human Performance
To test the hypothesis that alterations in central hemodynamics are associated with changes in splenic volume and splenic doppler resistive index (SDRI) measurements. 8 participants completed pre/post-apneas hematocrit, hemoglobin, PWV, cBP, SDRI, splenic volume measurements. The Δ-central diastolic pressure and Δ-spleen volume ($r=-0.749$, $p=0.033$) were negatively correlated.

(26) Changes in Strength, Range of Motion, and Overuse Injury Symptoms in Collegiate Baseball Pitchers During the Competitive Season

Gavin Frey* & Graeme White*
Mentor: Brett Pexa, Athletic Training

Collegiate baseball pitchers experience high workloads, which could influence their overuse injury risk. This study aims to identify changes in shoulder strength, shoulder range of motion, overuse injury symptoms, and lower extremity force output in elite baseball pitchers across a competitive season.

(27) Evidence of Haversian Remodeling in Rodents of Larger Body Size and Longer Lifespans

Amanda Mamrick*, Corey Kalinoski, & Susan Lad
Mentor: Susan Lad, Health and Human Performance

Rodents have long been assumed to lack Haversian remodeling, a bone repair process important for skeletal integrity in mammals. Histological analyses of beaver and muskrat femora (thigh (bones) reveal that large-bodied rodents with long lifespans do remodel, indicating that there may be size and/or longevity constraints on Haversian remodeling.

(28) Self-Reported Musculoskeletal Soreness in Collegiate Athletes With and Without a History of Anterior Cruciate Ligament Reconstruction

Allie Pratt*, Molly McCarver*, Garrett Hess, Kevin Ford, Jeffrey Taylor, & Brett Pexa
Mentor: Brett Pexa, Athletic Training

This case-control study examined soreness in collegiate soccer athletes with and without anterior cruciate ligament reconstruction (ACLR). While overall soreness frequency and intensity were similar, athletes with ACLR reported more frequent knee soreness and greater accumulated soreness. Findings suggest ACLR may cause persistent localized soreness, highlighting self-reported soreness monitoring as a useful tool for recovery and injury prevention.

(29) Countermovement Jump Outcomes in Injured and Uninjured Collegiate Athletes

Brian Shaw*
Mentor: Brett Pexa, Exercise Science

This study assesses countermovement jump (CMJ) outcomes in athletes with and without history of Anterior cruciate ligament reconstruction (ACLR). 13 college athletes with ACLR and 36 uninjured athletes were compared. Results demonstrated CMJ outcomes are an inadequate measure of biomechanic changes following ACLR due
to altered force-generation strategies athletes employ.

(30) Haversian Remodeling in a Mink Baculum

Morgan Stephens*, Jane Long*, Susan Lad, & Haley Horbaly
Mentors: Haley Horbaly & Susan Lad, Health and Human Performance

Haversian remodeling is a repair response to strain-induced bone microdamage, presumably unlikely to occur where mechanical demands are low. Mink baculum (penis bone) histological analysis reveals substantial evidence of remodeling, indicating that it can occur in areas of low strain, possibly induced by angiogenesis rather than being mediated by strain.

French

(31) The Design of French Baroque Gardens and Fountains: Examining the Distinctive Elements of French Baroque Gardens Through a Comparative Analysis of Geometry, Hydraulics, Political Significance, and Cultural Context in the 17th Century
Lilianna Allen*
Mentor: Benoit Leclercq, World Languages
Understanding the significance of how French baroque principles were adapted across cultures and expressed in gardens through geometry, fountains, and scale. Through comparative analysis, I show how each garden adapted baroque ideals to topography and culture, while exploring their remarkable influence from the 16th to 18th century and across continents.

History

(32) The Executed and The Executioner: Racial Disparity in Colonial Legal Systems
Kaitlyn Sanchez*
Mentor: Andrew Tzavaras, History
This presentation compares French and English North American colonial legal systems regarding slavery and capital punishment, using the cases of Louis Congo and an executed person known only as "Mark."

Honors

(33) Examining the Relationships between Disordered Eating Behaviors, Self-Compassion, and Theory of Mind
Haley Gorman*, Contessa Kim*, Ashley Mullens*, & Nathan Stockman*
Mentor: Stacy Lipowski, Psychology
This study examined the relationships between theory of mind, self-compassion, and disordered eating. Results indicated that frequent disordered eating behaviors correlated with lower levels of self-compassion and theory of mind. These findings have implications regarding treatments for disordered eating that target self-compassion and theory of mind.

(34) Food-Evoked Nostalgia and Its Effects on Well-Being
Ava Pierce*, Luke Bantamoi*, Hayley Martin*, Emma Renee Monge*, & Nora Fallon*
Mentor: Pamela Lundin, Chemistry
This study addresses the relationship between nostalgia and wellbeing. More specifically, whether nostalgic food images can produce an immediate, measurable change in self-reported well-being rather than recording pre-existing emotional associations. Data was gathered using a survey consisting of nostalgic stimuli and pre- and post- experimental assessments.

(35) "What Would You Do for a Klondike Bar?" - Food as a Motivator; Memory and Engagement in College Students
Daniel Pitt*, Logan Muller*, Finn Twomey*, & Payten Meyer-Senkarik*
Mentor: Silvana Rosenfeld, Anthropology
Food is known to be a strong incentive and extrinsic motivator, and we hypothesize it may increase engagement in organized events. Using 90 randomly-assigned participants, we'll examine how college students respond to food, non-food, or no incentive. Our findings may help event planners utilize incentives to plan successful, engaging events.

(36) Food Allergy Preparedness in Higher Education
Emma Schwindt*, Celia Langone*, Connor Kresock*, & Madison Elliott*
Mentor: Jay Putnam, Theatre
Universities and institutions are increasingly facing challenges managing food allergies in college students, with little research on decision-making and policy strategies. This study uses a qualitative survey sent out to administrators, registered dietitians, and dining staff across several southeastern states to examine how food allergy policies are created, implemented, and applied in campus dining.

(37) The Food–Mood Connection: Food Cravings and Emotional Well-Being During Pregnancy
Riley Verner*, Julia Andresson*, Audrey Houle*, & Cassidy Kreiger*
Mentor: Stacy Lipowski, Psychology
Pregnancy-related hormonal changes influence eating behavior and mood, yet the relationship between food cravings and emotional states remains understudied. Using surveys and daily real-time mood tracking, this study examined how craving intensity and responses—indulging or resisting—relate to mood in pregnant women, contributing to understanding of maternal emotional well-being.

(38) How Social Media Influencers Shape the Food Sensory Experience
Andrew Wester*, Lillie Wilson*, Gianna Kocur*, & Vaughn Selders*
Mentor: Pamela Lundin, Chemistry
Social media influencers drive consumer trends, but do they alter sensory reality? This study investigates whether viewing positive or negative influencer reviews changes how participants rate sensory attributes like flavor and quality. The results illustrate how the psychological power of suggestion can affect perception.

Interior Design

(39) Second Chapter Commons
Kamden Ray*
Mentor: Jane Nichols, Interior Design
Second Chapter Commons is a community space for older adults designed to support connection, independence, and dignity. Layered seating clusters, clear sightlines, warm lighting, acoustic zoning, and familiar material cues encourage daily interaction, comfort, and wayfinding while supporting mobility, sensory ease, and cognitive clarity within a shared environment.

(40) Timeless Design: How an Iconic Historic Home Shapes Modern-Day Interiors
Nikki Schreiber*
Mentor: Kathryn Brandt, Interior Design
This research examines an iconic historic home to analyze the cultural, architectural, and stylistic design choices that define its significance. Through analysis of spatial organization, architectural form, materiality, and key design elements, the study evaluates how these concepts influence current interior design practice.

Medical Sciences

(41) Inhibition Of Choline Kinase Suppresses Adipocyte Differentiation Through AMPK Activation
Melanie Zylberberg*
Mentor: Tahl Zimmerman, Medical Sciences
Obesity is driven by adipocyte differentiation and lipid accumulation. Using 3T3-L1 cells, we investigated whether inhibition of choline kinase with MN58b modulates adipogenesis through AMPK signaling. Preliminary viability data indicate minimal cytotoxicity, with ongoing studies assessing lipid accumulation and AMPK activation as potential mechanisms.

Neuroscience

(42) Autism Spectrum Disorder in Cerebral Organoids
Chloe Buffalino* & Michael Grider
Mentor: Michael Grider, Neuroscience
Autism spectrum disorder (ASD) is rapidly growing, yet its neurological causes remain unclear. This study aims to examine ASD using 3D cerebral organoids from induced pluripotent stem cells. We use organoids missing a specific Autism-related gene, KCNMA1, to identify changes in the expression of all other important genes during development.

(43) Testing the Effects of Plant and Fungal Extracts on Injured PC12 Neurons
Kal Hyun Burgess Hicks*
Mentor: Michael Grider, Neuroscience
This project investigated the potential recuperative effects on neurons by contact to anthocyanins and fungal extracts. We did so by exposing cultured PC12 neurons to oxidative injury via introduction of hydrogen peroxide solutions. We have encountered preliminary results show a dose-dependent protective effect of extracts from the fungus, *Penicilina antarctica*.

(44) Cognition and Aβ Deposition Predict Grocery Shopping Performance in Older Adults
Christopher Phillips*, Cory Alcon, Samuel Lockhart & Lisa Zukowski
Mentor: Lisa Zukowski, Physical Therapy
Subtle cognitive decline associated with preclinical Alzheimer's disease (AD) may affect performance on complex, everyday tasks. Identifying these effects could provide opportunities for early intervention. Using eye-tracking, this study examines how demographics, social factors, cognition, and amyloid-beta (Aβ) deposition predict grocery shopping performance in younger and older adults.

(45) Investigating the Neuroprotective Effects of Delta-9 THC Against Oxidative Injury
Catherine Summerrow* & Julia Crenshaw*
Mentor: Michael Grider, Neuroscience
Serotonergic (RN46A and RN46A-B14) cells were cultured, injured with hydrogen peroxide(H2O2), and treated with Delta-9 THC to gauge the neuroprotective antioxidant effects of Delta-9 THC on a severe injury. Delta-9 THC- treated cells did not show statistically significant improvement in trial in either cell type.

Physical Therapy

(46) ***Preventing Work-Related Musculoskeletal Injuries: An Intervention Study on High-Intensity Strength Training for Novice Physical Therapists***
Jadaa Cruz*
Mentor: Jamie Kronenberg, Physical Therapy
Workplace physical exercise must be practiced by physical therapists to prevent work-related injuries, as their role consists of frequent patient transfers. Participants' knowledge of body mechanics will be evaluated based on a questionnaire. It is anticipated that knowledge of proper body mechanics will decrease work-related pain and increase workability.

(47) Multi-session Transcranial Alternating Current Stimulation to Improve Dual-task Standing in Older Adults with MCI
Devon Derrenbacher*, Brady Thomas*, Brad Manor, Alvaro Pascual-Leone, & Melike Kahya
Mentor: Melike Kahya, Physical Therapy
This study examined whether transcranial alternating current stimulation (tACS) improves cognitive and motor function in older adults with Mild Cognitive Impairment. Those who received tACS showed significantly improved balance compared to sham($p=0.013$). Overall, the results of this study may support the notion of using tACS to reduce fall risk.

(48) Movement Quality and Knee Health in Golfers With and Without Surgical History
Kennady Milligan*, Westyn Woodard*, Garrett Hess, Lance Mabry, Dave Sinacore, Jeff Taylor, Kevin Ford, & Don Goss
Mentor: Don Goss, Physical Therapy
This study compares golf swing biomechanics, knee health, and performance in two female golfers with and without prior knee surgery. Three-dimensional motion capture, clinical assessment, and imaging demonstrated greater pain, reduced swing performance, and altered knee loading in the surgical participant, suggesting surgical history and osteoarthritis influence functional golf mechanics.

Physics

(49) Simulated Uncertainties in The Monte Carlo Fitting Method
Skyler Gangestad*
Mentor: Adam Anthony, Physics and Astronomy
Fission is a nuclear reaction where a heavy nucleus splits into two smaller nuclei. Using simulations, we studied how mass-splitting and decay angle affect uncertainty in a Monte-Carlo fitting method. By testing different conditions, we aim to improve the accuracy of this method and enhance fission analysis.

(50) Feasibility of a Gas Degrader at FRIB for Fission Studies
Thomas Owens* & Adam Anthony
Mentor: Adam Anthony, Physics and Astronomy
Controlling heavy nuclei's kinetic energy is crucial for studies of nuclear reactions. We explored a gas-based degrader to provide more precise energy control compared to an iron degrader. Simulations guided gas selection, and a test chamber assessed film strength, confirming the degrader's feasibility.

Psychology

(51) Learning About Color Concept Associations Through Game Play
Gabriella Abadir* & Julia Ravega*
Mentor: Melissa Schoenlein, Psychology
This project explores how board games can be used to study communication about colors and concepts. Participants completed classic or modified gameplay: generating clues representing colors and guessing colors from clues. This method demonstrates that gameplay, specifically word types and knowledge between players, can be used to investigate color-concept associations.

(52) Examining the Relationship Between AI Use, AI Literacy, and Academic Performance in Undergraduate Students
Kayla Denoo*
Mentor: Jana Spain, Psychology
This study examines the relationship between artificial intelligence (AI) use, AI literacy, and academic success among undergraduate students. It investigates how AI uses and students' understanding of AI is associated with GPA and comprehension. Findings aim to clarify patterns of AI use and how AI literacy relates to academic outcomes.

(53) The Impact of Color Categories on Associations Between Colors and Concept
Gavin Klueg*
Mentor: Melissa Schoenlein**,** Psychology
This study explored whether color-based features in a learning context influence how people form color-concept associations. Participants learned to associate novel concepts (aliens) with colors sharing a color category (blues) or spanning categories (blue/purple). Results show that patterns of learned associations depend on whether concepts share a color category.

(54) Parasocial Rejection: Emotional and Aggressive Responses to Media Figures
Eva Morris*
Mentor: Kirsten Li-Barber, Psychology
This study examined how parasocial relationships with social media influencers and television characters relate to emotional responses and aggression following hypothetical rejection scenarios. Results indicated stronger effects for television characters, with parasocial relationship strength and emotional instability predicting greater emotional reactivity and aggression-related tendencies.

(55) Coping with Politics: Stress and Substance Use
Jessamina Piazza*
Mentor: Deborah Danzis, Psychology
This study examined the relationship between scenario-specific political-event stress, media exposure, and desire for substance use in young adults. Scenario-specific political stress was positively correlated with substance use urges, and frequent news exposure was associated with greater substance use. General stress showed no significant correlations.

(56) Self-Critical Rumination is Associated with Higher Levels of Implicit Identification with Non-Suicidal Self-Injury (NSSI)
Ashley Rodriguez*
Mentor: Laura Nagy, Psychology
Tested if implicit identification with NSSI mediated the relationships between trait self-criticism and self-critical rumination and NSSI history. Participants completed various self-report measures for NSSI and self-criticism. Results suggest that ruminating on self-critical thoughts may increase implicit identification with NSSI, while simply having higher trait levels of self-criticism may not.

(57) Type D Personality, Self-Criticism, and Their Links to Pain Catastrophizing and Disability
Laney Schenher* & Brianna Tyler*
Mentor: Kelly Curtis, Psychology
This study examined whether Type D personality and self-criticism predict pain-related disability among 347 adults with chronic pain. Both Type D and internalized self-criticism were significant predictors of disability. Emotional distress and pain catastrophizing strengthened the model, suggesting these factors help explain how personality traits contribute to disability outcomes.

(58) GLP-1 Medications: Body Image and the Side Effects People Are Willing to Tolerate
Lauren Yaroma*
Mentor: Daniel Krenzer, Psychology
GLP-1 medications are increasingly used for weight loss and may contribute to expectations of improved body image. The present study examines perceptions of GLP-1s, willingness to use them, side-effect tolerance, and their associations with self-esteem and body image. Findings aim to clarify psychological factors influencing interest in GLP-1 use.

Technical Exhibits III

2nd Floor Concourse (Hallway)

12:45 pm – 2:00 pm

Game Design

(59) Creepy Brawlers

Francisco Ortiz*, Damien Gross*, Daniel Bourbonnais, & Beatriz Nogueira

Mentor: Brain Heagney, Game Design

Creepy Brawlers is an insect-based platform fighting game with mostly anatomically correct insects where players fight to death, committing insecticide.

(60) Crease vs The Reign of Tearer

Clara Owen*, Nate Zapata*, Brad Killian*, Claire Meehan*, Joseph McConnico Sharpe, & Lexi Harloff*

Mentor: Brian Heagney, Game Design

Traverse a paper wasteland as Crease, an adorable piece of origami paper, fighting off evil office supplies in hopes of defeating the ultimate boss, Tearer.

(61) Herb Doctor

Margaret Underwood* & Bonnie Ni*

Mentor: Brian Heagney, Game Design

Herb Doctor is a game in which players gather natural ingredients from a South American–inspired forest to craft medicines. Players must make difficult choices about who receives life-saving treatment. Through these decisions, Herb Doctor aims to create an experience that is both engaging and thought-provoking.

Computer Science

(62) Panther Power Arcade

Christopher Langhorne* & Mason Sheehan*

Mentor: Eve Klopf, Engineering

The goal of this project was to create a fully functioning, user-friendly arcade machine that is capable of running retro games. The arcade machine features a two-player design, retro arcade-style buttons, a joystick interface, an integrated display, and a custom-built wooden cabinet.

Dance Performances

Premiere Ballroom 2202 G

1:15 p.m. – 2:00 p.m.

InterCurrent
Monica Kepins
Mentor: Lindsey Howie, Dance
Performers: Elizabeth Devine, Sophie Hanks, Devlin Turner
Inspired by the painting *Returning to Water 6* by Casey Murano. This piece investigates the idea that just as we need water to sustain our physical bodies, healthy human connections are also vital in sustaining the well-being of our minds and souls. Throughout the piece, the dancers explore different dynamics of relationships and the emotional distress that comes with isolation.

I Will Carry You
Jessamina Piazza
Mentor: Lindsey Howie, Dance
Performers: Gianna Aiello Williams, Nicole Amorocho, Natalee Balestra, Addison Clary, Maryna Crawford, Toni Frost, Catherine Gallagher, Catrina Gromley, Monica Kepins, Addison Lee, Jessamina Piazza, Emerson Schmidt, Devlin Turner, Madison Walsh
This piece reflects the complex realities of health care workers as they navigate the emotional, psychological, and physical effects of patient mortality. Through a variety of scenarios surrounding patients' passing, this dance serves as both a humble offering of appreciation to all those in the medical field and a call to mind the lived experiences of caregivers.

In the Mourning
Kendall McDowell
Mentosr: Lindsey Howie & Christine Stevens, Dance
Performers: Kaitlyn DeGraw, Mia Geter, Ava Griswold, Ryann Perry, Genevieve Schultz,
In The Mourning is a physical meditation on emotional aftershock. It begins not at trauma, but in its echo—when memory reenters the body uninvited. This piece explores involuntary reliving through sensation. Circular, restless movement mirrors anxious memory: flooding, retreating, repeating, unraveling—while the body remembers what the mind tries to forget.

flow
Catherine Gallagher
Mentors: Lindsey Howie & Christine Stevens, Dance
Performers: Nicole Amorocho, Natalee Balastra, Toni Frost, Catherine Gallagher, Monica Kepins, Jessamina Piazza, Emerson Schmidt, Genevieve Shultz, Devlin Turner
This piece explores the psychological theory of the flow state and how finding moments of stillness and focus in an overstimulated world can be beneficial for well-being. Through the use of wave-like movement motifs and ebb and flow physicality, the dancers represent a state of complete immersion and concentration.

Student Index

Mentor Index

Acknowledgments

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Special thanks to all the mentors who dedicated their time
and energy to help our students shine. Mentorship matters!

SHOW 'EM YOU WERE HERE!

Don't miss a moment!
Scan the QR code below to join our Photo Circle!
Also, share your High-PURCS experience through your favorite social media.

High-PURCS ASSIGNMENT PARTICIPATION

If your professor has assigned participation in the High-PURCS requirement, please scan the QR code located at the registration table.
Complete the form associated with your course by answering the required questions and submitting your responses.

The form will be available for 24 hours.

Nido and Mariana Qubein Conference Center Map