FLORIDA ATLANTIC UNIVERSITY
Harriet L. Wilkes Honors College

23rd ANNUAL

SCHOLARLY & CREATIVE research SYMPOSIUM

Friday, April 4
John D. MacArthur Campus

Chastain Lecture 2025

All of Us or None of Us:
Imagining a Technological Future

SPEAKER
HINA SHAIKH, PH.D.

Assistant Professor, University of Florida

1999 | 2024
25 YEARS OF Honors

23RD ANNUAL

SCHOLARLY & CREATIVE research SYMPOSIUM

SYMPOSIUM COMMITTEE

SYMPOSIUM COMMITTEE:

Annina Ruest – co-chair

Zachary Ferrara – co-chair

Conrad Toepfer

Wairimũ Njambi

Alex Coffman (ex officio)

MESSAGE FROM DEAN JUSTIN PERRY, PH.D.

Welcome to the 23rd Annual Harriet L. Wilkes Honors College Scholarly and Creative Research Symposium, in which we celebrate the high-caliber, original scholarship and creativity of our students. Today we have the opportunity to watch the students we have taught, advised, and mentored share their academic research and creative projects with a broad audience of community members and their peers. Their intellectual curiosity combined with many hours spent in laboratories, in field research sites, on data collection, on reviews of literature, and on writing and revising has produced over 100 publications by our students in peer-reviewed academic journals. We hope that you enjoy this day as much as we do, and we encourage you to ask questions, engage with our students, support your peers, and challenge yourself to cross interdisciplinary boundaries.

— Dean Justin Perry, Ph.D.

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The 2025 Robert Lee and Thomas M. Chastain Honors Symposium Lecture Presents:

HINA SHAIKH, PH.D.

Assistant Professor, University of Florida

Chastain Lecture 2025

All of Us or None of Us:

Imagining a Technological Future

EVENT SCHEDULE: APRIL 4, 2025

8:30-9:00	Participant Registration	AD Building
9:15-10:15 AM	Session 1: Oral Presentations	AD Building
10:15-10:30	Break	
10:30-Noon	Session 2: Oral Presentations	AD Building
Noon-1:00	Break	
1:00-2:00 PM	Chastain Lecture: Hina Shaikh, Ph.D.	AD 119
2:00-4:00 PM	Session 3: Visual Arts and Creative Research Research Poster	 SR Building HC Building

SESSION 1 AND 2: ORAL PRESENTATIONS SCHEDULE

All student abstracts are included in alphabetical order on the pages following the presentation schedule grids.

SESSION 1 AND 2: ORAL PRESENTATIONS SCHEDULE

All student abstracts are included in alphabetical order on the pages following the presentation schedule grids.

SESSION 1

	AD 103	AD 104	AD 202	AD 204	AD 205
Moderator	**Nancy Tille-Victorica**	**Kevin Lanning**	**Tim Steigenga**	**Shaina Rowell**	**Kelsie Bernot**
9:15 AM	Kayla Win	Lauren Reynolds	Michael Pedro	Nicole Litvinchuk	Allison MacKenzie
9:30 AM	David Carmenate	Angelina Emerson	Isabelle Solages	Marli Knox	David Baldwin
9:45 AM	Jadyn Cooper	Miguel Castillo	Kassandra Liburd	Calyssa Setterberg	Maya Clarke
10:00 AM	Patton Horton	Emari Wimberly	Tarruk Wheeler	Alexander Castronovo	Isabelle Haahr

SESSION 2

	AD 103	AD 104	AD 202	AD 204	AD 205
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10:45 AM	Kassidy Dunn	James Ireland	Ellie Pfahler	Gabriela Pereira Odisio	Vilmaris Alvarado
11:00 AM	Lucas Deese	Brendan Daily	Madison Kaplan	Joshua Sadule	Ayan Sanaullah
11:15 AM	Victoria White	Sebastian Lopez	Angie Jurado	Ashley Espinosa	Jason Pindell
11:30 AM	Nicholas Price	Karina Syc	Micah Campbell	Grace Patterson	Lizbeth Moncada
11:45 AM	Nakul Balaji	Luiz Do Prado		Ethan Houston	Danylo Fedkiv

ORAL PRESENTATIONS

9:15 AM

AD103 **KAYLA WIN**

Advisor/Professor: Tracy Mincer, Ph.D. and Erik Duboué, Ph.D.

Using Behavioral Tests to Gauge the Role of Cholesterol Dysregulation in Alzheimer's Disease

AD104 **LAUREN REYNOLDS**

Advisor/Professor: Kevin Lanning, Ph.D.

Linguistic Analysis of User Narratives and Community-Rated Moral Judgments on Reddit's r/AmITheAsshole

AD202 **MICHAEL PEDRO**

JUAN DIEGO JARAMILLO

Advisor/Professor: Timothy Steigenga, Ph.D. and Christopher Strain, Ph.D.

Clean Haven

AD204 **NICOLE LITVINCHUK**

Advisor/Professor: Lucia Carvelli, Ph.D.

Using the Million Mutation Project strains to identify candidate genes linked to abnormal Amphetamine-induced behaviors

AD205 **ALLISON MACKENZIE**

JON MOORE, PH.D.

Advisor/Professor: Jon Moore, Ph.D.

Survey and Analysis of Gopher Tortoise Demographics in Range VIb of the Abacoa Greenway

9:30 AM

AD103 DAVID CARMENATE

Advisor/Professor: Keith Jakee, Ph.D.

Silencing Dissent: The Consequences of Centralized Control Over Speech, Knowledge, and Economy in Revolutionary Cuba

AD104 ANGELINA EMERSON

Advisor/Professor: Kevin Lanning, Ph.D.

From Sleep to Synucleinopathies: REM Sleep Behavior Disorder as an Indicator of Neurodegeneration

AD202 ISABELLE SOLAGES

Advisor/Professor: Timothy Steigenga, Ph.D. and Christopher Strain, Ph.D.

Med to Med: Empowering Underrepresented Youth in Medicine

AD204 MARLI KNOX

SARAH COHEN, PH.D.

Advisor/Professor: Sarah Cohen, Ph.D. and Robert Stackman, Ph.D.

Tracing direct neuronal projections from the mouse perirhinal cortex to the hippocampus

AD205 DAVID BALDWIN

Advisor/Professor: Kelsie Bernot, Ph.D. and Mike McCoy, Ph.D.

Experimental and Quantitative Modeling of Plant Eco-Physiological Adaptation and The Limited Homeothermy Hypothesis Using Novel Infrared Imaging Techniques in the Acacia Genus

9:45 AM

AD103 **JADYN COOPER**

ERICA HENN

Advisor/Professor: Catherine Trivigno, Ph.D.

The Importance of Representation in Female Entrepreneurship

AD104 **MIGUEL CASTILLO**

Advisor/Professor: Kevin Lanning, Ph.D.

Linguistic Markers of Academic and Social Integration in First-Generation College Students' Online Reddit Discourse

AD202 **KASSANDRA LIBURD**

Advisor/Professor: Timothy Stegienga, Ph.D. and Christopher Strain, Ph.D.

Sign and Shine Community Program

AD204 **CALYSSA SETTERBERG**

Advisor/Professor: Shaina Rowell, Ph.D.

Remembering Fear: Using the Horror Genre to Explore Emotional Complexity in Autobiographical Memory

AD205 **MAYA CLARKE**

SVEN ZEA, MEGAN RUSSELL AND ANDIA CHAVES-FONNEGRA, PH.D.

Advisor/Professor: Andia Chaves-Fonnegra, Ph.D.

Cliona Delitrix Population Demographics and Ecological Sucession in San Andrés Reefs, Colombia

10:00 AM

AD103 **PATTON HORTON**
JON MOORE, PH.D.
Advisor/Professor: Jon Moore, Ph.D.
A Study on The Ecology & Morphology of Howellidae in the Gulf of Mexico

AD104 **EMARI WIMBERLY**
Advisor/Professor: Kevin Lanning, Ph.D.
Revisiting: The Authoritarian Personality in 2025

AD202 **TARRUCK WHEELER**
Advisor/Professor: Christopher Strain
"Digital Crutches":
The Role of Language Models in Supporting Dyslexic Students

AD204 **ALEXANDER CASTRONOVO**
AYA ZUCCA AND NAOMI KAMASAWA
Advisor/Professor: Tricia Meredith, Ph.D.
Surface Area Calculation of Voxel Segmentations of Postsynaptic Densities in Volume Electron Microscopy Data

AD205 **ISABELLE HAAHR**
Advisor/Professor: James Wetterer, Ph.D. and William O'Brien, Ph.D.
A diet analysis of pellets from wild and captive Barn Owls (*Tyto furcata*)

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10:30 AM

AD103 **SOFIA WISKOFF**
Advisor/Professor: Yaouen Fily, Ph.D.
A computational model for ATP transport and the role of creatine in neurons

AD104 **MIABETH GORODETZER**
Advisor/Professor: Christopher Ely, Ph.D.
The Development of ASL from 1816 to Today

AD202 **JOSEPH MANSOUR**
Advisor/Professor: N/A
The Impact of Corruption on Lebanon's Governmental Institutions and the Connection to Terrorism

AD204 **ABBAGAYLE MADANAT**
Advisor/Professor: Mark Tunick, Ph.D. and Kevin Lanning, Ph.D.
Citizens United: The 2010 Crisis in the Marketplace of Ideas

AD205 **ZAKIYAH WORD**
Advisor/Professor: Warren McGovern, Ph.D.
The Musical Connection to Math

10:45 AM

AD103 **KASSIDY DUNN**

Advisor/Professor: Kanybek Nur-tegin, Ph.D. and Terje Hill, Ph.D.

How Effective are Machine Learning Algorithms in Enhancing Marketing Strategies?

AD104 **JAMES IRELAND**

Advisor/Professor: Michael Harrawood, Ph.D.

Shakespeare and Gender in "Twelfth Night"

AD202 **ELLIE PFAHLER**

Advisor/Professor: Timothy Steigenga, Ph.D. and Carmen Cañete Quesada, Ph.D.

What Happens to Those Who Stay? The Environmental And Socioeconomic Impacts of Climate Migration in Guatemala's Dry Corridor

AD204 **GABRIELA PEREIRA ODISIO**

Advisor/Professor: Mark Tunick, Ph.D.

State-Imposed Silence: How Anti-Boycott Laws Conflict with Corporate Free Speech

AD205 **VILMARIS ALVARADO**

Advisor/Professor: Warren McGovern, Ph.D.

Group Rings

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AD103 **LUCAS DEESE**

JASON PINDELL, HANNA BRIDGHAM AND JORDON BECKLER

Advisor/Professor: N/A

Finding Sediment Derived CDOM in the Northern Gulf of Mexico

AD104 **BRENDAN DAILY**

Advisor/Professor: Jill Rahaim, Ph.D.

Phenotypic Characterization of Mouse Models of GNAO1 Disorder

AD202 **MADISON KAPLAN**

Advisor/Professor: Timothy Steigenga, Ph.D.

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AD204 **JOSHUA SADULE**

Advisor/Professor: Mark Tunick, Ph.D.

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AD205 **AYAN SANAULLAH**

RODRIGO PENA, PH.D.

Advisor/Professor: Rodrigo Pena, Ph.D.

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AD103 **VICTORIA WHITE**

Advisor/Professor: Michal Pirog, Ph.D.

Simulating Collisions: Insights into Binary Neutron Star Mergers

AD104 **SEBASTIAN LOPEZ**

Advisor/Professor: Tricia Meredith, Ph.D.

HTS to identify modulators of Neuro D6, a master regulator associated with comorbidities of HIV

AD202 **ANGIE JURADO**

Advisor/Professor: Keith Jakee, Ph.D.

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AD204 **ASHLEY ESPINOSA**

Advisor/Professor: Mark Tunick, Ph.D. and Timothy Steigenga, Ph.D.

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Advisor/Professor: Tucker Hindle

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Advisor/Professor: Michal Pirog, Ph.D.

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AD104 **KARINA SYC**

Advisor/Professor: Christopher Ely, Ph.D

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AD202 **MICAH CAMPBELL**

Advisor/Professor: Keith Jakee, Ph.D.

Informaion for Sale: General Motors, Analytical Firms and Data Ownership

AD204 **GRACE PATTERSON**

Advisor/Professor: Mark Tunick, Ph.D. and Rachel Luria

Off the Shelves: Florida's Book Bans and the First Amendment

AD205 **LIZBETH MONCADA**

Advisor/Professor: Catherine Trivigno, Ph.D.

Structural Insights into Ligand Selectivity in the Glucocorticoid Receptor

11:45 AM

AD103 NAKUL BALAJI

Advisor/Professor: Terje Hill, Ph.D.

Binding Affinity of Diazirine and Alkyne Small Molecules Targeting c-MYC mRNA CUG Repeats

AD104 LUIZ DO PRADO

Advisor/Professor: Keith Jakee, Ph.D.

The Beatles' Apple Records: A Case Study in Entrepreneurial Failure and its Implications

AD204 ETHAN HOUSTON

Advisor/Professor: Mark Tunick, Ph.D. and Timothy Steigenga, Ph.D.

Cuyler v. Sullivan and the Crisis of Indigent Representation: Balancing Justice, Workloads, and State Budgets

AD205 DANYLO FEDKIV

Advisor/Professor: Chandani Singh, Ph.D. and Gregg Fields, Ph.D.

The Synthesis and Evaluation of the Potential of Novel FRET-Based Fluorogenic Peptide Probes for Matrix Metalloproteinase 13 Identification and Characterization

VISUAL ARTS AND CREATIVE RESEARCH

SR BUILDING, ROOM 149

2:00 - 4:00 P.M.

ERIN BELL

Advisor/Professor: Dorotha Lemeh

The Blood Was On My Hands

LUKE EZRA BERG
PATTON J. HORTON

Advisor/Professor: N/A

Scientific illustrations of species within the Howellidae family

LUKE EZRA BERG

Advisor/Professor: Dorotha Lemeh

Artist Books

GAVIN CRAFT

Advisor/Professor: Annina Ruest

Metamorphosis

SOPHIA FERREIRA

Advisor/Professor: Vincent Lardieri and Catherine Trivigno, Ph.D.

Fog and Monsters

RICHARD "TRIP" KEEFAUVER

Advisor/Professor: Dorotha Lemeh and Vincent Lardieri

Off the Old Gray Track - Animated Pilot and Pitch Bible

RICHARD "TRIP" KEEFAUVER

Advisor/Professor: Dorotha Lemeh

Portrait of the Body in Art

CHRISTINA MCCABE
DELANEY ROSENBLATT
Advisor/Professor: Dorotha Lemeh
TBD - The Body for Itself

CHRISTINA MCCABE
Advisor/Professor: Dorotha Lemeh
Untitled (Landscape)

CHRISTINA MCCABE
TABITHA WAGGNER
Advisor/Professor: Dorotha Lemeh
Untitled (Number Tree)

ELLA PEARSON-MARTINEZ
Advisor/Professor: Dorotha Lemeh
The Lived Body

CAITLYN SEAL
Advisor/Professor: Dorotha Lemeh
Kiddie Thoughts

SOFIA WASILEWSKI
Advisor/Professor: Dorotha Lemeh
The Body in Art

Elements of Visual Thinking

Advisor/Professor: Vincent Lardieri

ARIANA BUILES, LONDON COHN, DAMIEN HOUSEL, MADISON KAPLAN, NALON KING, MALIA S. MCGETCHIN, DOROTHY MYSIUK, JORDON POMERANTZ

Drawing I

Advisor/Professor: Vincent Lardieri

GIA BURNETT, NALANI EASTLACK, SOPHIA FERREIRA, AUTUMN GRIGGS, SABRINA GUARDINO, CHARLOTTE MILLS, BLAINE NAYLOR, HANNAH PATINO, ALICIA SCARLETT, ISABELLE SULAGE, JESELLE TORTUGO

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YASHWIN ADUSUMILLI

Advisor/Professor: Tucker Hindle

Pharmacological Manipulation of SynGAP Protein Expression to Improve Brain Function and Behavior

PRISCILLA AGRINSONI

Advisor/Professor: Daniel de Lill, Ph.D. and Veljko Dragojlovic, Ph.D.

Testing the Catalytic Potential of Crown Ether Complexes as Homogeneous Catalysts for Biodiesel Synthesis

RACHEL ALLISON

Advisor/Professor: Jon Moore, Ph.D.

Survey and Analysis of Gopher Tortoise Demographics in Range X of the Abacoa Greenway

ROBERTO ALONSO-GUMA

Advisor/Professor: Zachary Ferrara, Ph.D.

The Power of Personalization: How Tailored Marketing Drives Consumer Engagement

SERENA AMRO GAZZE

PETER IGWILO, RENEE MAPA, JOHANNA E. KOWALKO AND ERIK R. DUBOUÉ

Advisor/Professor: Erik Duboué, Ph.D.

Investigating the Neuroanatomy of Adult Astyanax mexicanus Using a Fully Segmented, Digital 3-Dimensional Brain Atlas

JOHNIYA ATTERBURY

ANDRE RAJOO AND LUCIA CARVELLI, PH.D.

Advisor/Professor: Lucia Carvelli, Ph.D.

Reducing the Amphetamine-Induced Oxidative Stress in C. elegans Using Quercetin

CRISTAL AUGER
CRISTINA FENOLLAR FERRER, PH.D. AND RANDY D. BLAKELY, PH.D.

Advisor/Professor: Jennifer Krill

One in a Million Shot: Novel genetic screen for genes involved in dopamine signaling

MIKAYLA BARKER
SHAINA ROWELL, PH.D.

Advisor/Professor: Shaina Rowell, Ph.D.

Technological Temptations: Examining the Academic Impact of Digital Distractions on Undergraduate Students

JESUS BECERRA
Advisor/Professor: Laura Vernon, Ph.D. and Rachel Corr, Ph.D.

Wishful thinking: The powerful acts of ritual and tarot card divination when applied to psychotherapy

CHANTAE BENNETT
Advisor/Professor: Tanja Godenschwege, Ph.D. and Catherine Trivigno, Ph.D.

The Role of Dsd in Regulating Insulin Producing Cells in Response to Glucose

LUKE EZRA BERG
RINDY ANDERSON, PH.D. AND HEATHER WOLVERTON

Advisor/Professor: James Wetterer, Ph.D. and Rindy Anderson, Ph.D.

Investigation of Bachman's Sparrow Habitat Preference and Site Fidelity in Relation to Prescribed Burns in Jonathan Dickinson State Park

MADELYN BROOKER
KATY HOSOKAWA

Advisor/Professor: Jon Moore, Ph.D. and William O'Brien, Ph.D.

Assessment of Endangered Key Deer (Odocoileus virginianus clavium) Population on Cudjoe Key, Florida Keys

TATYANNA CAPUTO
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Advisor/Professor: Shaina Rowell, Ph.D.

Are Study Group Environments Related to Follow-Through on Study Plans?

JACOB CARLSON
Advisor/Professor: Tracy Mincer, Ph.D. and Jason Hedetniemi, Ph.D.

Quantification and Characterization of the Microbiome of the Edible Halophilic Succulent Suaeda Linearis

ANDREW CHAMBERLIN
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Advisor/Professor: Dorota Tokmina Roszyk, Ph.D. and Gregg Fields, Ph.D.

Validation of Novel Screening Platform for MMP Substrate Specificity

RISHI CHHIBBER
MATTHEW DISNEY, PH.D. AND NOAH SPRINGER

Advisor/Professor: Matthew Disney, Ph.D. and David Myers, Ph.D.

Covalent Screening of Compounds That Bind to Disease Causing RNAs

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Advisor/Professor: Kelsie Bernot, Ph.D. and Tracy Mincer, Ph.D.

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KAYLA DIFEDE
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Advisor/Professor: Julie Earles, Ph.D.

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Advisor/Professor: Jon Moore, Ph.D.

Evaluating Fish Community Structure Along A Bermudian Lagoon Seascape

TRISANN GORDON
TRACY MINCER, PH.D., KELSIE BERNOT, PH.D. AND JON MOORE, PH.D.

Advisor/Professor: Kelsie Bernot, Ph.D., Tracy Mincer, Ph.D. and Jon Moore, Ph.D.

Environmental Reservoirs for Bacteria in Gopher Tortoise Habitats: Investigating Soil and Fecal Microbial Dynamics

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Advisor/Professor: Erik Duboué, Ph.D. and Alexandra Gribizis, Ph.D.

Morphological Development of Neuronal Projection Growth During Early Cortical Network Formation

SHYLA GRANT
Advisor/Professor: Tracy Mincer, Ph.D.

Understanding Microbial Adherence to Plastics

ALYSSA GREEN
Advisor/Professor: Catherine Trivigno, Ph.D.

Long-term Neurobehavioral Impact of Prenatal Oxycodone Exposure

KALANI HERNDON
BRISA URIBE

Advisor/Professor: James Wetterer, Ph.D.

Floral Survey of Eastern John D. MacArthus Campus

MORIAH HOLLAND
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Advisor/Professor: Eli Chapman, Ph.D. and Nick Mckee
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MARIAJOSE OLVERA-CALTZONIN, PH.D. AND SARAH A. STERN, PH.D.

Advisor/Professor: Catherine Trivigno, Ph.D.
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ALICE KIM
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WILLIAM JA, PH.D., KELSIE BERNOT, PH.D. AND SCARLET PARK, PH.D.

Advisor/Professor: Kelsie Bernot, Ph.D.
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ALEXANDER LOPEZ
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Advisor/Professor: Andia Chaves-Fonnegra, Ph.D. and Catherine Trivigno, Ph.D.
Assessing the Combined Effects of Spironolactone and Deydro-Cortistatin A on HIV Expression

GABRIELLA MAXEY

Advisor/Professor: Samantha McGovern

Whole-brain Mapping of Neuronal Interleukin-1 Type 1 Receptor in the Mouse Brain

RYAN MAYER

JACOB ROWE AND KIRILL MARTEMYANOV

Advisor/Professor: N/A

Identifying Conserved MAPK Regulators of Opioid Signaling Networks

MADISON MCADOO

TRACY MINCER, PH.D. AND JON MOORE. PH.D.

Advisor/Professor: Kelsie Bernot, Ph.D. and Tracy Mincer, Ph.D.

Fungal Communities Living Inside Gopher Tortoise Burrow Microhabitats

GWENDOLYN MURRAY

Advisor/Professor: Laura Vernon, Ph.D.

Turning Over a New Leaf: Veterans' Perspective on Mental Health After Wilderness Therapy

BAILEY PALMER

Advisor/Professor: William Ja, Ph.D. and Terje Hill, Ph.D.

Impact of Resveratrol Derivative Resveramorph-3 on Drosophila Models of Alzheimer's Disease

ISABELLA PASSANISI

CHRISTOPHER SPAGNOLIA, PH.D., TYLER SMITH AND ANDIA CHAVES-FONNEGRA, PH.

Advisor/Professor: Andia Chaves-Fonnegra, Ph.D.

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Advisor/Professor: Jon Moore, Ph.D. and Annie Page, DVM, Ph.D.

A Pathological Investigation of Cetacean Respiratory Disease: Insights from Strandings along the Southeastern Florida Coast

SURINA PREM

Advisor/Professor: Shaina Rowell, Ph.D.

School-Based Interventions for ACEs Using the SNAP Framework

ALLISON REESE

Advisor/Professor: Jason Hedetniemi, Ph.D. and Jacqueline Fewkes, Ph.D.

Predictive Popularity Possibility: Predicting Netflix Popularity in South Korea

JOSHUA REYNOLDS

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Advisor/Professor: Tania Godenschwege, Ph.D.

The Spatio-Temporal Role and Effect of Glucose on Distracted (Dsd) Protein Expression and its Endolysosomal Trafficking

LAUREN REYNOLDS

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Advisor/Professor: Catherine Trivigno, Ph.D.

SNAP® Youth Behavioral Intervention

ALAINA RUMRILL

ANDIA CHAVES-FONNEGRA, PH.D.

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Igniting Serotonin: Sources and Receptors in the Fire Sponge *Tedania ignis*

CAMILA SAMPAIO

Advisor/Professor: Nicholas R. Baima, Ph.D.

Roman Spectator Takes on Violence and Bloodshed in the Combat Sports of the Colosseum

GAEL SANON

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TRACY MINCER, PH.D., KELSIE BERNOT, PH.D. AND JON MOORE, PH.D.

Advisor/Professor: Kelsie Bernot, Ph.D. and Tracy Mincer, Ph.D.

From High Ground to Flooded Terrain: Vertebrates in Gopher Tortoise Microhabitats

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Advisor/Professor: N/A

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MELANIE SAROZA-PLACENCIA

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Short-Term Memory and Learning Inhibition in Fragile X Syndrome *Drosophila* Larvae

KIMBERLY SCHWELGER

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Developing a Microcontroller-Based Data Acquisition System to Measure pH

NICHOLAS SHAFFER

GLORIA BRUNORI, KIRILL MARTEMYANOV AND OMAR SIAL

Advisor/Professor: Chitra Chandrasekhar, Ph.D.

Therapeutic Targeting of mGlyR for MDD

ABIGAIL SHEPARD

Advisor/Professor: Rodrigo Pena, Ph.D.

Exploring Amplitude-Induced Variability in the Tree Shrew Visual Cortex: A Computational Approach

MACKENZIE STOWELL

Advisor/Professor: Laura Vernon, Ph.D.

Repeat Consumption of Media: How Does It Affect Our Stress?

JAKE THORNBERRY

DANIEL NEMETH, PH.D., NING QUAN PH.D., AKIHIKO OZAWA, PH.D. AND LAWRENCE TOLL, PH.D.

Advisor/Professor: N/A

Investigation of interleukin-1 beta expression in the brain under chronic inflammatory pain using Î²-TRAP mice

KAIYA TOMASIK

KELSIE BERNOT, PH.D., TRACY MINCER, PH.D. AND JON MOORE, PH.D.

Advisor/Professor: Tracy Mincer, Ph.D.

Investigating the Genetic Susceptibility of Cancer in Gopher Tortoises

AVA TRACY

JENNIFER KRILL, PH.D.

Advisor/Professor: Tracy Mincer, Ph.D.

Polystyrene Microplastics Impact on *Drosophila melanogaster* Development and Lifespan From Embryo-Adulthood

VYANA TRIEU

XIAOYI ZHU, ELI CHAPMAN, PH.D.

Advisor/Professor: Eli Chapman, Ph.D. and Xiaoyi Zhu

Investigation of Glucose-Regulated Protein 78 as a Potential Target for Lung Cancer

ARJUN VADLAMUDI

RODRIGO PENA, PH.D. AND JUAN LOPEZ, PH.D.

Advisor/Professor: Rodrigo Pena, Ph.D. and Juan Lopez, Ph.D.

Developing a Computational Model for the Giant Fiber System of *Drosophila*

SOFIA WASILEWSKI

Advisor/Professor: Dorotha Lemeh and Wairimũ Ngaruiya Njambi, Ph.D.

More Than Just Labels: Crafting Comfort and Authenticity in Intersecting Otherness

KAYLA WIN

Advisor/Professor: Tracy Mincer, Ph.D.

Microbiological Monitoring of ATP in a Veterinary Setting by Utilizing ATP Bioluminescence

Abstracts: Oral Presentations

ALPHABETICAL BY STUDENT'S LAST NAME

VILMARIS ALVARADO

Group Rings

A group ring, R[G], is the set of all elements of G together with a coefficient from R. Elements of group rings are classified similarly to rings. For example, an element, x, is classified as a unit if there exists another element, y, such that xy produces the multiplicative identity. In the integers, 1 is the trivial unit. Due to the variably large sizes of group rings, using Excel sheets often allows for easier computation of group elements and multiplication.

NAKUL BALAJL

Binding Affinity of Diazirine and Alkyne Small Molecules Targeting c-MYC mRNA CUG Repeats

Cancer remains one of the most significant health challenges globally, with the c-MYC proto-oncogene implicated in over 50% of cases, particularly in solid tumors. Dysregulated c-MYC promotes tumor growth and silences the immune response, making it a key target for cancer treatments. This study investigates small molecule therapeutics to inhibit c-MYC mRNA translation by targeting its CUG repeat expansion in non-coding regions, which contain unique structural loops ideal for pharmacologic targeting. A fully functional fragment (FFF) library was used to identify compounds with specific binding properties. Molecules featuring diazirine and alkyne groups were incubated with c-MYC mRNA, and UV light activated diazirine crosslinking for selective binding. A TAMRA fluorophore was attached through click chemistry for fluorescence detection. Results indicated specific structural features enhanced binding affinity, suggesting small molecules can inhibit c-MYC protein production. Future research will optimize these compounds for innovative cancer therapies.

DAVID BALDWIN

Experimental and Quantitative Modeling of Plant Eco-Physiological Adaptation and The Limited Homeothermy Hypothesis Using Novel Infrared Imaging Techniques in the Acacia Genus

As climate change leads to more frequent and severe heatwaves, understanding plant responses to extreme temperatures becomes critical for predicting their survival and ecological roles. This study employs infrared thermal imaging to investigate the thermal regulation mechanisms of four Acacia species—A. ulicifolia, A. terminalis, A. inaequilatera, and A. citrinoviridis—under simulated heatwave conditions. Under heatwave conditions 15°C above control, heat-exposed plants showed a leaf temperature increase of only 7.5°C, indicating a significant capacity for thermoregulation. High thermal variance across leaf surfaces quantifies the hypothesized randomly organized cooling mechanisms of leaves. No significant effect of different leaf morphologies—termed thermal units—on homeothermic behavior suggests an evolutionarily conserved trait. The resilience of Acacia species and the utility of thermal imaging for elucidating plant physiological responses to climate-induced stress paves the way for further exploration into the adaptive strategies of diverse plant taxa in the ever-hotter Anthropocene.

MICAH CAMPBELL

Information for Sale: General Motors, Analytical Firms and Data Ownership

The automotive industry has made numerous technological advances in the past decade. The addition of cellular capabilities to vehicles has allowed manufacturers to collect and sell their consumers' Driving Data to third-party analytical firms, which ultimately sell it to insurance companies. General Motors, which owns four subsidiaries, has been collecting and selling its drivers' data without their knowledge. This Driving Data collection scheme has led Texas Attorney General Ken Paxton to sue GM for their actions. The issue of individual privacy can be analyzed through the lens of multiple theorists, such as Posner, Hirschleifer, Laudon, and Acquisti. Although these four individuals have varying views on privacy, the combination of their views can help us to understand why individuals should have an inherent right to their private information, including their Driving Data.

DAVID CARMENATE

Silencing Dissent: The Consequences of Centralized Control Over Speech, Knowledge, and Economy in Revolutionary Cuba

This thesis examines the consequences of state control over speech, information, and economic life in post-1959 Cuba, arguing that such centralization led to intellectual stagnation, suppression of dissent, and long-term economic inefficiencies. Through an analysis of Cuba's policies—particularly Fidel Castro's 1961 speech Palabras a los Intelectuales and the 1976 Constitution—it demonstrates how the Cuban government institutionalized ideological conformity and restricted independent thought. The historical evolution of Cuba's political and economic structures is explored to provide empirical grounding for a broader theoretical critique. Drawing on the insights of F.A. Hayek, James M. Buchanan, and Frédéric Bastiat, the study illustrates how centralized control inherently suppresses competition in knowledge, culture, and markets, leading to systemic decline. These outcomes are not unique to Cuba but are inherent in any Marxist or totalitarian system where the state monopolizes truth and knowledge. By evaluating Cuba as a case study, this thesis reinforces classical liberal critiques of authoritarian governance and planned economies.

MIGUEL CASTILLO

Linguistic Markers of Academic and Social Integration in First-Generation College Students' Online Reddit Discourse

First-generation college students enter higher education without familial roadmaps, facing unique challenges such as lack of support, financial constraints, and difficulty adjusting to academic rigors. Online forums such as Reddit give insight into the challenges and experiences of these students, providing a platform to share their struggles and seek advice from peers who understand their situation. Early work by Pennebaker established a connection between the words people use and their psychological states, providing a window to an individual's own emotional and cognitive processes. The present study examines the language of First-Generation College Students within related Reddit communities using the Linguistic Inquiry and Word Count (LIWC-22). The implications of this research can reveal the unique needs and experiences of First Generation College Students. Further, universities can leverage these insights to create targeted programs and interventions, fostering academic success and promoting overall wellbeing for this student population.

ALEXANDER CASTRONOVO

Surface Area Calculation of Voxel Segmentations of Postsynaptic Densities in Volume Electron Microscopy Data

Within the synapse, the postsynaptic density (PSD) is a region of the postsynaptic terminal imaged by electron microscopy. PSD surface area correlates with synaptic strength, helping to understand neuronal communication. However, manual analysis using tools like Amira are time-consuming. Morales et al. (2013) created an algorithm to compute PSD surface area from focused ion beam-scanning electron microscopy images (FIB-SEM) images, but we found the tool unsuitable for serial block face-scanning electron microscopy (SBF-SEM) images. We developed an algorithm to automatically calculate PSD surface area for SBF-SEM datasets, adapted from the Morales algorithm. We evaluated accuracy by comparing the algorithm's output to data measured with Amira. Our algorithm has a median deviation of 10.4% from Amira's output, compared to 52.8% with the Morales algorithm. We confirmed a strong correlation between PSD area and dendritic spine head volume. Our algorithm significantly reduces analysis time compared to manual techniques, including Amira.

MAYA CLARKE

Cliona Delitrix Population Demographics and Ecological Succession in San Andrés Reefs, Colombia

As climate change decimates coral populations, excavating sponges are becoming prominent in some reefs as critical bioeroders. This thesis aims to assess ecological succession patterns and population demographics of the excavating sponge Cliona delitrix on San Andrés, Colombia reefs over 20 years. Population growth was quantified and compared to the percent cover changes of coral, macroalgae, and other benthic organisms. A frequency analysis was run to assess the successor prevalence per substratum. On live corals, succession after C. delitrix death is dominated by a diverse community of organisms, including macroalgae, turf algae, sponges, calcareous algae, and others. However, on dead corals macroalgae is the main successor, with sponge and macroalgae interacting and competing for the remaining space. Understanding reefs as dynamic entities with succession patterns and populations not always dominated by coral better prepares us for embracing their next phase as sea surface temperatures (SSTs) rise.

JADYN COOPER

The Importance of Representation in Female Entrepreneurship

Entrepreneurship plays a crucial role to drive economic growth, create societal change, and strengthen communities. Despite its importance, men outpace women in entrepreneurship, with less than one quarter of entrepreneurs in the United States being women. This disparity creates a serious economic loss because of the reduction of innovative ideas and the lack of differing perspectives on pressing issues. Due to this issue, there is a demonstrated need for intervention services that encourage women to get involved in entrepreneurship. Working alongside with Junior Achievement--an organization that promotes entrepreneurship, financial literacy, and work readiness--I share their recent initiatives that engage female entrepreneurs in the local community and assess the effectiveness of such efforts. I also intend to collect personal stories from women in entrepreneurship about their career paths, the challenges that confront them, and what strategies they have used to inspire other women to join careers in the same field.

BRENDAN DAILY

Phenotypic Characterization of Mouse Models of GNAO1 Disorder

Several mutations in the GNAO1 gene have been associated with a disease known as GNAO1 encephalopathy. Among these mutations, G203R is highly prevalent in patients manifesting both severe movement disorders and epilepsy. Animal models of the GNAO1 disorder are needed to understand the etiology of the disease, and no mouse model of G203R mutation has previously been described. Here, we characterize mouse models of the GNAO1 disorder expressing the G203R mutation in different brain regions. One mouse model isolates G203R expression to the striatum, involved in movement control, and another to the forebrain, involved in seizures. Following phenotypic behavioral evaluation, we found that the expression of the G203R mutation within the striatum leads to motor abnormalities, while expression in the forebrain results in a seizure phenotype in mice. These mouse models recapitulate core symptoms of the GNAO1 disorder and will be instrumental for future therapeutic development.

LUCAS DEES

Finding Sediment Derived CDOM in the Northern Gulf of Mexico

Colored Dissolved Organic Matter (CDOM) in remote sensing (RS) applications is a proxy measure to oceanic Dissolved Organic Carbon (DOC). CDOM is derived from multiple sources: fluvial, biological, & sediment-derived (SD), impacting carbon cycling in coastal areas like the northern Gulf of Mexico (nGoM). The distance between bottom and surface waters makes SD CDOM challenging to measure & differentiate from other sources via RS. By developing a novel method of identifying SD CDOM using NASA sea surface temperature (SST) data & previously created CDOM algorithms, we will identify SD CDOM. SD CDOM in surface waters will be detected by locating low SST, high CDOM areas with RS, and be validated with comparison to known hydrological events & in-situ measurements. Preliminary results show promise in identifying SD CDOM surfaced by events causing significant upwelling, such as hurricanes. This should allow for the accounting of SD CDOM in coastal carbon budgets.

LUIZ DO PRADO

The Beatles' Apple Records: A Case Study in Entrepreneurial Failure and its Implications

While the Beatles revolutionized music in the 1960s, their venture into the production side of the industry, Apple Records, was an entrepreneurial disaster. Despite this, Apple Records unintentionally disrupted the market in ways overlooked by Israel Kirzner's and Joseph Schumpeter's success-oriented entrepreneurial theories. These frameworks focus on successful outcomes, neglecting the uncertainties, decisions, and real-time processes faced by entrepreneurs. Our analysis critiques this bias, showing how failed ventures like Apple Records can still create market impacts. For example, Apple Records launched successful artists like James Taylor, Billy Preston, and Badfinger. Additionally, Paul McCartney gained production skills he later applied to his successful venture, McCartney Productions Limited. This case study highlights the need for entrepreneurial theories that include failure as a vital aspect of the entrepreneurial process, offering a more comprehensive understanding of entrepreneurial behavior and contributing to the evolution of entrepreneurial theory.

KASSIDY DUNN

How Effective are Machine Learning Algorithms in Enhancing Marketing Strategies?

In recent years, artificial intelligence has gained widespread attention, fueling debates across numerous sectors. However, its influence on the marketing industry remains relatively underexplored. This study examines the history of machine learning algorithms and marketing strategies, aiming to assess whether AI is benefiting or restricting marketing strategies. By examining relevant research and case studies, we will explore the benefits and challenges of using machine learning in marketing, while also analyzing AI's impact on various industries, including healthcare, coupons, telecommunications, and banking.

ANGELINA EMERSON

From Sleep to Synucleinopathies: REM Sleep Behavior Disorder as an Indicator of Neurodegeneration

REM Sleep Behavior Disorder may hold the key to unlocking earlier and more accurate diagnoses of Dementia with Lewy bodies. Evidence suggests that REM Sleep Behavior Disorder is not an isolated sleep disorder but an early manifestation of Lewy Body pathology, including Parkinson's disease and Dementia with Lewy Bodies. I propose that REM Sleep Behavior Disorder should be recognized as a clinical marker of developing neurodegeneration rather than an idiopathic condition. Identifying individuals at risk during this preclinical phase has the potential to enhance differential diagnosis and accuracy while providing opportunities for earlier intervention. Reframing REM Sleep Behavior Disorder as an indicator of early neurodegeneration has significant implications for improving patient care, potentially shifting treatment strategies toward proactive rather than reactive. Focusing on REM Sleep Behavior Disorder refines our understanding of disease progression in Dementia with Lewy bodies and may enable targeted interventions before significant decline occurs.

ASHLEY ESPINOSA

From Deference to Disarray: The Demise of Chevron and the Future of Federal Agencies

The Supreme Court's decision in Loper Bright Enterprises v. Raimondo to overturn deference established in Chevron U.S.A., Inc. v. Natural Resources Defense Council represents a significant disruption to administrative law, shifting interpretive authority from federal agencies to the judiciary. Chevron deference required courts to uphold federal agencies' reasonable interpretations of ambiguous statutes. Proponents of its repeal argue that Chevron improperly gave agencies too much power and contend that eliminating Chevron restores the courts' role in statutory interpretation. However, this shift threatens agencies' ability to effectively address pressing policy issues in a rapidly evolving society. Without this framework, judges, rather than experts, now have greater control over regulatory policy, weakening agency authority. This thesis examines the foundation of Chevron, its role in enabling agencies to implement congressional mandates and the theoretical and practical implications of Loper. I argue overturning Chevron expands judicial policymaking at the expense of functional expertise.

DANYLO FEDKIV

The Synthesis and Evaluation of the Potential of Novel FRET-Based Fluorogenic Peptide Probes for Matrix Metalloproteinase 13 Identification and Characterization

Matrix Metalloproteinases (MMPs) are zinc-based enzymes that cleave extracellular matrix proteins and contribute to many of the body's regular functions as well as certain acute diseases. There are over 20 MMPs and, among other techniques, it is possible to locate and characterize them using fluorescence resonance energy transfer (FRET) peptide probes. We created three novel probes using the Liberty CEM Peptide Synthesizer, cleaved them off the resin they were synthesized on, characterized them using high-power liquid chromatography (HPLC) and mass spectrometry (MS), and tested them against the MMP-13 and related MMPs. We found that the three peptide probes selectively targeted MMP-13 versus other common MMPs, favorably showing significantly more activity. With these probes in hand we now have a better understanding of how MMPs selectively choose what to target, having potential applications in medicine when identifying diseases characterized by MMPs (such as osteoarthritis, certain cancers, and more).

MIABETH GORODETZER

The Development of ASL from 1816 to Today

American Sign Language is the primary sign language used by the Deaf community in the United States. Like all languages, there is a rich history to it. This presentation aims to show a piece of that history and the development from Old French Sign Language to today, some regional variation, and the effects of a rise in technology on ASL.

ISABELLE HAAHR

A diet analysis of pellets from wild and captive Barn Owls (*Tyto furcata*)

The American Barn Owl, Tyto furcata, is a widespread New World species ranging from Canada to the southernmost parts of Southern America. T. furcata is a nocturnal predator, typically found hunting in large open fields. I studied the nutrition of T. furcata by examining the undigested prey fragments in pellets regurgitated by three captive individuals cared for at Busch Wildlife Sanctuary in Jupiter, Florida, and pellets collected from a nest box used by wild T. furcata at a South Florida Water Management District site in Hendry County, Florida. In total, 35 pellets were collected from the wild nesting site, and a combined 41 pellets were collected from the three captive owls. I compared the contents and construction of these pellets, and with my analysis I aim to better understand the nutrition and dietary habits of T. furcata, both captive and wild.

PATTON HORTON

A Study on The Ecology & Morphology of Howellidae in the Gulf of Mexico

This study examines the ecology and morphological characteristics of the family Howellidae, basslet-like midwater fishes, found in the Gulf of Mexico. The two main species of interest are Howella atlantica and Bathysphyraenops simplex, the latter being a novel record for the region. Most of the specimens were obtained via the DEEPEND project, and some were acquired via other collections. Through morphometrics and general observation, the two species were analyzed for developmental changes and differences in morphology. Each species was compared to similar species found globally, including Howella sherborni, Howella zina, and Bathysphyraenops simplex to check identifications. Several of the specimens were dissected to observe the stomach contents for dietary analysis. Both species were predating mostly crustaceans, with some evidence of other soft-bodied invertebrates, such as chaetognaths, as well. The capture data was also analyzed to determine vertical migration patterns of H. atlantica based on capture depth and time.

ETHAN HOUSTON

Cuyler v. Sullivan and the Crisis of Indigent Representation: Balancing Justice, Workloads, and State Budgets

Across the country, public defenders have challenged laws that bar them from seeking relief for an overload of cases or inadequate funding, stating that those factors render them unable to provide their clients with their constitutional right to adequate counsel. Some state courts, like Florida's, have interpreted the Supreme Court precedent, Cuyler v. Sullivan, to mean that public defenders can seek relief for an overload of cases or inadequate funding because those factors result in a conflict of interest and, therefore, a violation of the Sixth Amendment. I defend that expanded interpretation through a historical examination of the right to council precedents ranging from English Common Law to the present, an analysis of contemporary legal arguments, and public policy considerations. Given the financial strain that this relief for public defenders creates, such as mandating increased funding for indigent representation, I discuss the options that states have in addressing this issue.

JAMES IRELAND

Shakespeare and Gender in "Twelfth Night"

Much of the discussion surrounding William Shakespeare regarding the cultural zeitgeist of gender ideologies posits that Shakespeare's work expresses alternative modes of sexual comportment. However, I will argue that Shakespeare, in his play Twelfth Night, implicitly employs a surprising transformative approach to shattering the preconceived gender paradigm of binaries that were commonplace in Elizabethan England. and that in modern times are at the center of a very heated debate. This paper delineates the modern discourse on gender fluidity through historian Joan Scott's analysis of heteronormative approaches to gender pedagogical teachings, as well as the intersectionality of gender in racial, social, and economic lenses. Then, by recontextualizing Viola's role in Twelfth Night through utilizing scholars examining the underlying discourse scribed within the crevices of the play, I will argue that Twelfth Night is indicative of modern progressive gender fluidity ideals being found by scholars in Shakespeare's works.

MADISON KAPLAN

Thesis Abstract

Realism and then neorealism were the dominant paradigms in international relations theory from the 1940s through the 1990s. These theories treat states as largely rational actors responding to the security dilemma through self-help in an international environment characterized by anarchy. Thus policies such as Ronald Reagan's Operation Cyclone, supporting the Mujahadeen in Afghanistan to fight against the Soviet occupation, have been explained through the lens of realism. Since the end of the Cold War, constructivist theorists have questioned both the assumptions and the predictions of realism. This thesis evaluates Reagan's policy in Afghanistan, comparing the constructivist and realist approaches, and argues that constructivism provides a better explanation for policy than realism. Furthermore, the insights arising from the constructivist approach are useful for informing policy and potentially reducing long-term blowback effects, such as the eventual formation of Al Qaeda and the attacks of 9/11.

MARLI KNOX

Tracing direct neuronal projections from the mouse perirhinal cortex to the hippocampus

The contribution of the hippocampus, a critical brain structure for long-term memory, is remarkably conserved between mice and humans. Episodic memories formed in the hippocampus integrate spatial information with item/object information from the perirhinal cortex (PRh). Whether the mouse perirhinal cortex (PRh), particularly its rostral deep layers (IV-VI), directly projects to the CA1 region of the dorsal hippocampus is unclear. Retrograde viral tracer injections into the dorsal CA1, coupled with whole-brain clearing and 3D imaging with light-sheet microscopy will permit comprehensive tracing of neuronal populations and projections. We aim to elucidate the pathway and population of direct PRh → CA1 projection neurons utilizing atlas compositing on 3D whole-brain images. Results to date support the view that PRh neurons project to the CA1 of the dorsal hippocampus directly and indirectly via neighboring regions to support memory.

KASSANDRA LIBURD

Sign and Shine Community Program

Sign and Shine is a community program designed to uplift and empower our Deaf and Hard of Hearing (DHH) children in local communities. The program aims to offer a safe space for youth development, with a peer-mentorship program targeted towards DHH students from grades K-12. These students will be paired with one another to increase interaction with other DHH individuals across academic and other areas. Sign and Shine will build a community by offering American Sign Language courses for friends and families of DHH children, while also providing vocational training for medical professionals, educators, and lawyers. We will also spread awareness by hosting community events and providing resources and support for all ages. By providing an inclusive environment where children are seen as more than their disability, Sign and Shine will provide DHH children the opportunity to grow and thrive successfully.

NICOLE LITVINCHUK

Using the Million Mutation Project strains to identify candidate genes linked to abnormal Amphetamine-induced behaviors

Amphetamine (Amph) is a psychostimulant drug that increases extracellular dopamine at the dopaminergic synapses, making chronic Amph users liable to addiction. This project aims to identify yet uncharacterized candidate genes within the dopaminergic system and their involvement in Amph-induced behaviors. In C. elegans, Amph causes a dopamine-dependent behavior named Swimming induced paralysis (Swip). We used Swip to screen animals for altered Amph response. To facilitate the identification of genes involved in the mechanism of action of Amph, we utilized C. elegans strains from The Million Mutation Project (MMP) bearing random but well-characterized mutations. The Amph-induced Swip in the MMP strains tested, so far, were not significantly different with respect to the control group. Our plan is to test more MMP strains to increase the probability of finding a strain with an Amph-related gene mutation.

SEBASTIAN LOPEZ

HTS to identify modulators of Neuro D6, a master regulator associated with comorbidities of HIV

This project explores NeuroD6 as a target for high-throughput screening (HTS) to mitigate HIV-associated neurocognitive disorders (HAND). NeuroD6, a neuronal transcription factor from the basic helix-loop-helix (bHLH) family, is critical for neuronal differentiation, survival, and mitochondrial function. Previous studies highlight its role in enhancing mitochondrial biogenesis and bioenergetics, key factors in neuroprotection. This study aims to identify compounds that upregulate NeuroD6 expression using a miniaturized NEX1 ACT assay in a 1536-well format. The assay utilizes luciferase-based luminescence to quantify NeuroD6 activation in transfected Neuroscreen cells. Preliminary results from the HTS campaign have identified lead compounds that significantly induce NeuroD6 expression and demonstrate potential neuroprotective effects in vitro, showing improved mitochondrial biogenesis and synaptodendritic integrity. Data analysis will assess compound efficacy using Z' factors for validation. By identifying modulators of NeuroD6, this research seeks to contribute to novel therapeutics for HAND and other neurodegenerative diseases. These findings can lead to the development of novel therapeutics to ultimately mitigate (HAND).

ALLISON MACKENZIE

Survey and Analysis of Gopher Tortoise Demographics in Range VIb of the Abacoa Greenway

Gaining an understanding of the population of the threatened native Florida keystone species, the gopher tortoise (Gopherus polyphemus), is significant due to the roles their burrows play in engineering the ecosystem and providing shelter for many other individuals that are comprised of native, endangered, and protected species. This survey was conducted to obtain demographics on the gopher tortoise population in range VIb of the Abacoa Greenway in Jupiter, FL. By collecting this data, we are able to better understand the long-term viability of the total population of the Abacoa Greenway, including a comparison of the population of neighboring sections of the Greenway habitat. This survey also provides a closer examination of the growth rates and sexual maturity of gopher tortoises in section VIb, which coincides with the findings that the tortoise population grows faster and sexually matures at a younger age, as shown in a previous survey of section VIa of the Abacoa Greenway when compared to the growth rates of tortoises in more northern regions of Florida.

ABBAGAYLE MADANAT

Citizens United: The 2010 Crisis in the Marketplace of Ideas

In Citizens United v. FEC (2010), the Supreme Court ruled that corporations, like individuals, have First Amendment rights, enabling limitless corporate spending on political advocacy. This decision, made in the name of free speech, discounted concerns about corruption and destabilized the marketplace of ideas by granting corporations disproportionate influence and effectively drowning out citizens' voices. I demonstrate how Citizens United deviated from legal precedents and the Framers' intentions for the First Amendment. Drawing from On Liberty, I argue that John Stuart Mill, one of history's greatest free speech advocates, would have opposed the ruling, recognizing its distorting effects. I further underscore practical concerns including the role of corporations as political agenda-setters and widespread public concern over their influence, as reflected in polling data. To restore a balanced marketplace of ideas and ensure that democracy remains "for the people", I conclude that Citizens United must be overturned.

JOSEPH MONSOUR

The Impact of Corruption on Lebanon's Governmental Institutions and the Connection to Terrorism

Corruption in Lebanon's governmental and legislative institutions has entrenched inefficiencies that have exacerbated socio-economic inequalities, and in turn fostered a ripe environment for terrorism. This thesis investigates how systemic corruption, driven by sectarian politics and the consolidation of power by elites, has undermined governance and public trust. I utilize Dennis F. Thompson's Institutional theory of corruption to explore how a combination of resource mismanagement, governance failures, and socio-economic inequalities have led to deepened poverty and created vulnerabilities exploited by extremist groups. Then I expand upon this by using the Normative and Causal theories of corruption by Seamus Miller to explore how corruption takes place, and use the terrorism and corruption framework by Elizabeth Reiter Dettmer and Jay Feghali to prove the connection between terrorism and corruption. I conclude by outlining the need for transparency and comprehensive reforms to rebuild Lebanon's governance capacity, improve quality of life, and eradicate terrorism.

LIZBETH MONCADA

Structural Insights into Ligand Selectivity in the Glucocorticoid Receptor

Glucocorticoids (GCs) are steroid hormones widely used to treat inflammation, hormone-sensitive cancers, and autoimmune disorders, but their use is limited by side effects such as muscle atrophy and insulin resistance. To understand the structural mechanisms underlying tissue selectivity, we synthesized and profiled GCs targeting an understudied allosteric site on the glucocorticoid receptor (GR) ligand-binding domain. These ligands include pharmacophores with modifications designed to engage the GR solvent channel. Subtle changes to this site significantly influenced biological outcomes, such as transcriptional selectivity between GR and the progesterone receptor and modulation of interleukin-6 (IL-6) secretion. To investigate ligand selectivity, we used classical and enhanced-sampling molecular dynamics (MD) simulations, revealing key differences in ligand-receptor dynamics that provide mechanistic insights for GR ligand recognition and functional specificity.

GRACE PATTERSON

Off the Shelves: Florida's Book Bans and the First Amendment

In recent years, the state of Florida has become a focal point in the national debate over book-banning policies, with Florida Statutes §1006.28 enabling individual parent or resident objections to trigger school-wide removals in K-12 public school libraries and potential county-wide bans. This statute effectively allows a select, vocal minority to dictate what materials remain available to students in public schools, disproportionately shaping public school curricula based on personal biases rather than educational merit. The Florida law distorts individual parental complaints into sweeping, state-sanctioned censorship, raising significant constitutional questions about the First Amendment's limitations on governmental interference in the classroom. I argue that §1006.28 undermines parental authority and violates students' First Amendment protections by imposing overly broad restrictions on diverse perspectives in public education.

MICHAEL PEDRO

Clean Haven

Clean Haven is a social venture that combats both hygienic poverty and environmental sustainability. Our product is a premium, eco-friendly body wash that follows a "buy five, donate one" business model. Clean Haven ensures that for every five products sold, one is donated to individuals experiencing homelessness. The company's main product features a minimalistic design, with a a refillable bottle system aimed at reducing single-use plastic waste. In partnership with The Lord's Place, a nonprofit dedicated to breaking the cycle of homelessness in Palm Beach County, Clean Haven will create the first refill stations for use by their clients.. Through our target market of socially responsible and eco-friendly consumers, Clean Haven seeks to create a lasting impact by improving hygiene for those in need while reducing plastic production and waste.

GABRIELA PEREIRA ODISIO

State-Imposed Silence: How Anti-Boycott Laws Conflict with Corporate Free Speech

Is the corporate right to boycott protected by the 1st Amendment? Several states have enacted laws on two specific matters that assume it is not: (1) the boycotting of Israel due to its allegedly illegal occupation of Palestinian territory in the Gaza conflict as outlined by the Boycott, Divestment, and Sanctions (BDS) movement; and (2) the boycotting of industry sectors over Environmental, Social, and Governance (ESG) concerns. Drawing on decades of judicial precedents establishing expressive association liberties, which have increasingly blurred the distinctions between corporate and individual speech, I argue that state anti-BDS and anti-ESG laws fail the Supreme Court's 1st Amendment strict scrutiny test and violate corporate free speech rights.

ELLIE PFAHLER

What Happens to Those Who Stay? The Environmental And Socioeconomic Impacts of Climate Migration in Guatemala's Dry Corridor

The Central American Dry Corridor (CADC) spans the southern half of Guatemala and houses nearly 1/4th of the region's population. Climate change is damaging the environmental, social, and economic well-being of the CADC, driving high rates of out-migration, poverty, and environmental stress. This thesis argues that migration is a short-term strategy to adapt to climate change, but weakens long-term community resilience, supporting the argument that moderate economic gains fail to foster sustainable development and long-standing community stability. Analysis of 21 interviews collected in four departments (El Quiché, Totonicapán, Chiquimula, and Jalapa) highlight the link between high rates of out-migration, poverty, and environmental stress. This thesis suggests an expansion and clarification to the Intergovernmental Panel on Climate Change's definition of capacity to adapt being measured through "socioeconomic characteristics," and include how the migration patterns, ethnic makeup, familial, and economic dynamics of a community greatly influence capacity to adapt.

JASON PINDELL

Assessing the Efficacy of AI Detectors and Countermeasures in Generative AI

We study the effectiveness of large language model detectors by testing three evasion techniques. We introduce a novel prompt for the established iterative paraphrasing method and two novel test-time computing algorithms: content abstraction and coherence-perplexity branch optimization (CPBO). Content abstraction is a chain of thought prompting method that involves paraphrasing text across different temperatures, generating a reflection of each output before combining them all together. CPBO generates text branches by recursively continuing all tokens comprising of the top 20% probability mass and selecting the branch with the highest perplexity and potential coherence, as determined by a smaller fine-tuned model. The novel prompt achieved detectability as low as 0% on some detection algorithms. Preliminary results show content abstraction and CPBO have potential, though we have not thoroughly evaluated their efficacies due to execution time challenges.

NICHOLAS PRICE

Denoising Three-Photon Image Time Series using an Unsupervised Deep Learning Algorithm

While it is able to image 50% deeper than 2P microscopy, due to the lower laser repetition rate and lower emission probability in 3-photon (3P) microscopy, the images are susceptible to high levels of noise. Thus, efficient denoising methods are crucial to improve the signal-to-noise (SNR) ratio in 3P data. Current denoising methods are either not optimized for 3P images or are unable to maintain temporal fidelity post denoising. Using DeepCAD-RT, an unsupervised deep learning algorithm, we developed a denoising model for 3P image time series. DeepCAD-RT uses neighboring frames to determine ground truth, improving the SNR. We trained DeepCAD-RT using a variety of low SNR 3P image time series and adjusted the number of epochs, dataset size, patch size, and overlap factor. Preliminary testing has shown that the resulting model is able to improve SNR by 50% over an image time series while maintaining temporal fidelity.

LAUREN REYNOLDS

Linguistic Analysis of User Narratives and Community-Rated Moral Judgments on Reddit's r/AmITheAsshole

Reddit's r/AmITheAsshole is a popular online forum where users present moral dilemmas and receive community feedback, with designations such as "You're the Asshole" (YTA), "Not the Asshole" (NTA), or "Everyone Sucks Here" (ESH). My thesis explores how linguistic characteristics in user narratives influence moral judgment. It examines how variations in moral language related to harm, fairness, authority, purity, and loyalty, as defined by the Moral Foundations Dictionary, correlate with assessments of blameworthiness. Further analysis with other natural language processing tools identifies additional characteristics associated with different classes of moral judgment.

JOSHUA SADULE

Suicide and the State: Justifying Intervention Laws

Laws in many states allow state actors (like police officers) to intervene to prevent suicides and involuntarily hospitalize people who attempt suicide. These laws seem to substantially infringe upon citizen's autonomy, and this thesis is an attempt to determine what might justify that infringement. John Stuart Mill's liberalism, which allows state coercion only to prevent one from harming others, is not normally understood to prevent suicide, which harms only oneself. These laws might be justified under coercive paternalism, which allows state action to prevent harm to oneself, or by some versions of legal moralism, which allows the state to prevent moral wrongs; however, I reject these theories as unconvincing. Instead, I argue that intervention to ensure that decisions to end one's life are tethered to core commitments is justified under liberalism because autonomy, liberalism's primary goal, is not promoted if one can rashly choose to end one's life.

AYAN SANAULLAH

AI-driven multi-omics approaches for the early diagnosis of Alzheimer's disease

Alzheimer's disease (AD) is a devastating neurodegenerative disease which affects millions of people worldwide, particularly the elderly. There is an urgent need for early diagnosis to be performed before the onset of significant neurodegeneration occurs. This project is a study focused on applying artificial intelligence (AI) using multi-omic data-transcriptomic, proteomic, and lipidomic profiling with the purpose of early biomarker identification associated with Alzheimer's progression. We created 3 models: a Convolutional Neural Network (CNN), a 1D-CNN, and a Multilayer Perceptron (MLP). These models were fed with data from transgenic mouse models that express the ApoE4 genotype together with amyloid-beta plaques, thus emulating human AD. These datasets were transformed into image-like representations to enable CNNs to identify molecular interactions indicative of early AD. The models achieved a training accuracy of over 90% demonstrating a high precision in identifying patterns associated with early AD stages, suggesting strong efficacy and scalability for non-invasive AD diagnostics.

CALYSSA SETTERBERG

Remembering Fear: Using the Horror Genre to Explore Emotional Complexity in Autobiographical Memory

Autobiographical memories play a variety of functions in day-to-day life, from guiding future behaviors to helping form social relationships. Emotions hold a direct influence on how autobiographical memories are remembered and used, such as positive emotions leading to a more vivid and detailed memory recall experience. Little research has been conducted for complex and conflicting emotional experiences. The present study seeks to apply various theoretical frameworks to autobiographical memories of viewing horror films. In this experiment, participants described their most memorable and their most recent horror film viewing, rating both on the Memory Experiences Questionnaire Short Form. We expect to find significant differences in the ways both positive and negative memories are recalled, relating to their functions, level of emotionality, and level of detail.

ISABELLE SOLAGES

Med to Med: Empowering Underrepresented Youth in Medicine

Underrepresentation of Blacks and Hispanics in medicine has been one of the leading causes of health disparities in these communities. Med to Med is a social venture that aims to bridge this gap by inspiring and mentoring high school students from underserved communities toward healthcare careers. Through workshops, mentorship programs, and hands-on experiences, Med to Med provides early exposure to the medical field, emphasizing community-driven health equity. The project, developed in connection with the Kenan Scholarship, presents the implementation and impact of the Med to Med initiative. This presentation reviews the design of the program, its challenges, and its long-term aims for increasing diversity in medicine.

KARINA SYC

Palaces to Public: Revolutionary Origins of Museums in France and Russia

Museums in France and Russia emerged from revolutions that dismantled political structures and altered cultural boundaries. During the French Revolution, the Louvre became a public museum, marking the shift from monarchy to republic. Following the Bolshevik Revolution, Russia's Winter Palace transformed into the Hermitage Museum, reflecting socialist ideology and the public's new property. Each transition redefined elite spaces, made art and culture accessible to broader society, and served as revolutionary propaganda.

TARRUCK WHEELER

"Digital Crutches": The Role of Language Models in Supporting Dyslexic Students

This study examines how transformer-based language models (e.g., GPT) can transform dyslexic learners' reading experiences—shifting them from frustration to confidence. Dyslexic learners, who comprise roughly 10% of the global population, often encounter systemic inequities in traditional education. By harnessing these models' ability to provide text simplification, real-time feedback, and personalized learning, the research demonstrates promising strategies for enhancing accessibility and adaptive instruction. Notably, while AI tools can offer tailored support, there is a concern that overreliance on such systems may undermine students' development of independent mastery of skills. To address this, the study advocates for frameworks in which AI augments rather than replaces human instruction, underpinned by ethical guidelines that safeguard privacy and prevent bias. Integrating insights from cognitive science and ethical AI practices, this work outlines practical, transparent strategies that empower dyslexic learners and guide educators, policymakers, and developers in responsibly incorporating AI into learning environments.

VICTORIA WHITE

Simulating Collisions: Insights into Binary Neutron Star Mergers

Binary Neutron Star (BNS) mergers are among the most energetic events in the universe, producing gravitational waves, electromagnetic radiation, and heavy elements. While previous research has utilized simulations for collisions, none have accounted for how the spin of the stars affect their mergers. This research uses high-performance computing to simulate BNS collisions, examining how spin and orbital distance affect the inspiral, merger, and post-merger phases. Our programming languages used across different numerical codes and scripts are C and Fortran. We perform the numerical calculation using Â FAU's KoKo HPC Cluster. We anticipate improved accuracy on BNS merger simulations and insights into how spin influences merger behavior. The results will contribute to our understanding of BNS behavior, the production of heavy elements, and gravitational waves, refining astrophysical models.

EMARI WIMBERLY

Revisiting: The Authoritarian Personality in 2025

In my literature review I will be revisiting the history of the authoritarian personality introduced by Theodor Adorno in 1950s, subsequently after World War II. Authoritarianism is commonly characterized by the rejection of political pluralism, and embracing of conservatism as well as the unconditional submission to authority. I look to examine how the authoritarian personality is a threat to democracy because the extremities and political violence that can arise when trying to maintain the status quo. This is especially interesting when looking at individuals that commonly possess traits of authoritarianism, and how they often fall within the working-class. To aid in my analysis, I will looking at work from scholars like Adorno, Brown, Jost, Samelson, and Osborne. I aim to show how significance of authoritarianism as well as its relevance today.

KAYLA WIN

Using Behavioral Tests to Gauge the Role of Cholesterol Dysregulation in Alzheimer's Disease

Alzheimer's disease (AD) is a chronic and lethal disease that imposes an enormous economic and social burden worldwide. The popular amyloid hypothesis is questionable in the case of sporadic AD (sAD). Evidence has pointed to the dysregulation of lipids in the brain, especially cholesterol (Chol), during aging. New tissue-clearing methods like iDISCO and volume imaging (i.e., light-sheet microscopy, LSM) allow the study of molecular and cellular changes in large samples. Immunofluorescence labeling was used to distinguish two types of brain cells, neurons and astrocytes, and gauge their cellular Chol regulation by measuring the amount and distribution of SREBP212. A set of motor and memory tests were conducted to gauge the cognitive and sensorimotory functions of hApoE4/4 mice to compare them with age-matched male and female C57B6/J mice (control). The mice were tested side-by-side for a fair comparison. All data was statistically analyzed and plotted with Graphad Prism and RStudio. ANOVA, followed by post-hoc comparison tests, was used to identify statistically significant differences across different groups.

SOFIA WISKOFF

A computational model for ATP transport and the role of creatine in neurons

Neurons require substantial energy to function. This energy, in the form of adenosine triphosphate (ATP), is produced by mitochondria. ATP then diffuses to synapses where it is needed. However, when the synapse is far from the mitochondrion, it is unclear whether ATP diffusion alone is sufficient. This study models ATP diffusion from mitochondria to synapses. We also model the effect of creatine kinase (CK), an enzyme known to enhance ATP diffusion in muscles. Unlike a previous model, which assumed CK is only present at mitochondria and synapses, here we assume it is present throughout the axon.

ZAKIYAH WORD

The Musical Connection to Math

Research has shown that students who partake in musical activities tend to show significantly better test scores in the mathematics section. From creating musical lessons that incorporate math to examining the relationship between musical instructions and math scores, different studies have aimed to characterize the relationship between mathematical and musical skills. Spreading across 6 different articles and studies, this thesis examines the use of music and how the creative artform help students comprehend math. Ranging from the student's achievements on their respective state tests to discussing the experiences of a group of teachers going through a musical training course, readers of this thesis will learning about the connection between music and math from both the teacher's and student's preceptive. For prospective teachers, the thesis also shares the process one must undertake to become a middle school math teacher in the state of Florida.

ISABELLA ZUNIGA

Rhes & Slc25a1: Exploring a novel protein's role in Huntington's Disease

Huntington's Disease (HD) is a fatal diagnosis that results in slow yet aggressive neurodegeneration, specifically located in the striatum. Despite the advances in HD research and the identification of Rhes, a striatal protein fundamental to the spread of the disease, there is still a need to identify other proteins interacting with Rhes and the mechanisms by which they perpetuate cell toxicity in this neurodegenerative disease. Through the use of protein binding experiments and several other techniques, this study identifies Slc25a1, a vital citrate transporter found in the inner mitochondrial membrane, as a Rhes interacting protein, yet its implication in the disease and the meaning of this interaction is unknown. Understanding how Slc25a1 and Rhes colocalize could provide new insights into HD progression and potential therapeutic targets.

Abstracts: Visual Arts and Creative Research

ALPHABETICAL BY STUDENT'S LAST NAME

ERIN BELL

The Blood Was On My Hands

Excoriation disorder, also referred to as dermatillomania, is a mental disorder characterized by repetitive picking at one's own skin. As early as kindergarten, I can remember picking at my own skin– absentmindedly, no notion as to why that should be something shameful or bad. Ten years later, that was no longer the case– as I can recall looks of horror and concern from other kids at school, when those same 'poor habits' worsened with puberty. Quite literally– the 'blood was on my hands.' Well, and face. And back. And Arms. Guilt and shame dominated that period of my life, over a decade. As an adult, I have started unlearning these feelings– but I don't think I will ever forget. Here, I have put those emotions to canvas, with the goal of bringing to discussion dermatillomania, as well as other stigmatized BFRBs (Body-Focused Repetitive Behaviors), commonly experienced by those with OCD.

LUKE EZRA BERG

Scientific illustrations of species within the Howellidae family

Scientific illustrations detailing stages of Howella atlantica and Bathysphryaenops simplex development. Done in conjunction with Patton J. Horton's thesis on Howellidae identification in the Gulf of Mexico.

LUKE EZRA BERG

Artist Books

Creative and experimental artist books and zines made by the artist with mixed-media approaches from 2022-present.

GAVIN CRAFT

Metamorphosis

Metamorphosis is a large painting dissecting one's volatile emotional state in a time of extreme suffering. Acrylic paint applied through dish sponges, palette knives, and paintbrushes comprise the many layers, forming my tormented skeleton illuminated by a glowing Japanese plum blossom tree (ume) in the cold, colorful vacuum of space. A blossoming plum tree unfurls from my silhouette, speckling the void with budding flowers. My open mandible and distressed posture suggest I am screaming from the tree sprouting from my spine, while the naïve, smiling colors of the blossoms offer a silver lining in the misery. In the language of flowers, ume embody resilience, elegance, and perseverance—traits that are necessary to emerge from the destructive entropy of life with any semblance of self intact. All flesh and blood have been weathered away, leaving behind a barren skeleton and the luminescent ume rising from the ashes in a devastating metamorphosis.

SOPHIA FERREIRA

Fog and Monsters

"Let there be fog, and let there be monsters, and fantastic sights to all who follow you" is a line from the Brennu-Njáls saga, a classic piece of Icelandic literature. In this 8.5x11 drawing, I primarily used graphite to create a visually diverse composition that captures the essence of hope amidst uncertainty and challenges.

RICHARD "TRIP" KEEFAUVER

Off the Old Gray Track - Animated Pilot and Pitch Bible

My thesis is the development of an animated miniseries, culminating with a fully animated pilot episode to be presented with the entire thesis. To facilitate the successful creation of this project, I am following a similar pipeline of development used by both indie and studio animators. The pipeline will resemble the following in order: (1.) A pitch bible (i.e. an abstract and outline for the entire animation, featuring a summary, episode structure information, relevant story arcs, music, and more as needed), accompanied by main characters, a table of contents (story ideas for each episode*) and concept art; (2.) scripts; (3.) storyboards; (4.) relevant accompanying art (i.e. art separate but necessary to the development of the pilot—such as prop design, backgrounds, music, etc.); and finally, (5.) the final animated work.

RICHARD "TRIP" KEEFAUVER

Portrait of the Body in Art

The work of art will feature an abstract portrait, representing imagery of the human body and bodies in nature through various media. Such themes will included identity, what it means to exist with one's self, and how one's self-perception can lead to growth and/or decay.

CHRISTINA MCCABE

TBD - The Body for Itself

For the 'Body for itself' I plan to depict a self portrait, in a more realistic and surrealistic fashion. With acrylic paints and mediums, on canvas. I plan to focus on movement, and balance in my general composition. (Seen through the dancing body of the central figure) Through the image, I want to focus on how light and color can dramatically affect the theme of the piece.

ELLA PEARSON-MARTINEZ

The Lived Body

An exploration of the body as both a personal and social boundary reveals its importance as an intersection of self, environment, and the cosmos. This project examines how bodily representation in art reflects and challenges our understanding of identity, autonomy, and the mind-body relationship. Through visual experimentation, it investigates the tension between materiality and transcendence, considering how perception shapes and reshapes the body's form and vice versa. Themes of fragmentation, reflection, and transformation highlight the body's fluid nature, questioning how we come to know ourselves, others, and the world through it. Additionally, this work considers the body's relationship with cosmic forces, exploring how it is both shaped by and contributes to the larger universe.

LILITH PLANTE

GATE

The title of this game is GATE, which is short for the "Guardian Angel Testing Environment," or the name of the in-world software the player will be interacting with as part of this game. The player is positioned as an intern of an ambiguous company that has assigned the player to produce test results that shine a positive light on their new mental health app, the Guardian Angel. The game simulates a "participant," someone who was deemed suitably mentally unwell by the corporation to be a perfect representation of someone who their app could make better. While playing, you will be the ears and mouth of a brutally uncaring corporation, examining the social media status updates and various abstracted health statistics corresponding with the participant and using this information to suggest actions that they should take. However, you will never interact face-to-face with the participant. You, as the intern overseeing this trial, can only idly stand by the door to the participant's room, and will only ever know them through what they share online and through the statistics the Guardian Angel app shows you.

CAITLYN SEAL

Kiddie Thoughts

Reflections explore the fragile formation of identity through the lens of a young girl who navigates the worlds perceptions of her. This artwork captures the interplay between self-image and external judgment, illustrating how societal expectations, peer opinions, and fleeting interactions shape her evolving sense of self. Fragmented mirrors, layered portraits, and shifting light convey the tension between authenticity and conformity. As the girls reflection distorts and reshapes, the piece invites viewers to consider the profound impact of others gazes on personal identity, ultimately questioning where self-perception ends and external influence begins.

ART 1014: ELEMENTS OF VISUAL THINKING

Featured works created by students in ART 1014: Elements of Visual Thinking: Dorothy Mysiuk, Jordan Pomerantz, Damien Housel, Madison Kaplan, London Cohn, Nalon King, Ariana Builes and Malia S. McGetchin

ART 1300C: DRAWING I

Featured works created by students in ART 1300C: Drawing I: Blaine Naylor, Jeselle Tortugo, Sabrina Guardino, Autumn Griggs, Sophia Ferreira, Alicia Scarlett, Charlotte Mills, Isabelle Sulage, Nalani Eastlack, Gia Burnett and Hannah Patino

Abstracts: Research Poster

ALPHABETICAL BY STUDENT'S LAST NAME

YASHWIN ADUSUMILLI

Pharmacological Manipulation of SynGAP Protein Expression to Improve Brain Function and Behavior

SynGAP is a critical regulator of neuronal structure and function. Its expression levels are important both in the pathogenesis of neurodevelopmental disorders and in cognitive impairments. Our research makes use of the NDD-ChemScreen platform in identifying small molecules that modulate SynGAP expression in order to unravel mechanisms involved in either upregulation or downregulation. The use of dendritic tracing defines neuronal morphology and quantitates alterations caused by the compounds. High-content phenotypic screening identified selective small molecules classified as either SynGAP upregulators or downregulators. For instance, treatment with 4 ÂµM SR-1815 caused a sustained elevation in SynGAP levels, observed by Western blot analysis, showing a significant upregulation, normalized to DMSO control, to almost 3-fold after 14 days of treatment. In contrast, SR-1024 significantly decreased the expression of SynGAP by about 30% under similar conditions. This study provides the basic grounds for developing targeted treatments for neurodevelopmental disorders.

PRISCILLA AGRINSONI

Testing the Catalytic Potential of Crown Ether Complexes as Homogeneous Catalysts for Biodiesel Synthesis

The search for alternative fuel sources has increased interest in biodiesel production. Current methods are costly due to the need for high-purity feedstocks to avoid side reactions. Homogeneous catalysts are commonly used due to their low cost and easy accessibility; however, they are non-reusable, produce low-quality glycerol, and often require lengthy purification. This research focuses on developing and testing crown ether metal complexes as homogenous catalysts for biodiesel synthesis. Our goal is to achieve the catalytic efficiency of homogenous alkaline catalysts, like KOH, which are currently the most used in the industry. Firstly, a Kryptofix-22 derivative was synthesized by a nucleophilic substitution process. Next, said derivative was complexed with potassium ions. Lastly, the crown ether metal complex derivative was tested by employing a transesterification reaction for the creation of biodiesel. This work serves as the foundation for the future development of heterogeneous catalysts which can be fine-tuned and reused.

RACHEL ALLISON

Survey and Analysis of Gopher Tortoise Demographics in Range X of the Abacoa Greenway

Protecting the gopher tortoise (Gopherus polyphemus) remains of critical importance given their threatened status and their role as a keystone ecosystem-engineering species. Their burrows provide refuge for many other organisms, including native, endemic, and endangered species. This survey was conducted to obtain demographics on a population in range X of the Abacoa Greenway in Jupiter, FL to better understand the viability of the total population of tortoises in the greenway habitat and compare range X to range VIa. In previous research on range VIa of the greenway, gopher tortoises were found to exhibit faster growth rates and younger ages of sexual maturity than more northern gopher tortoise populations. The results of this survey coincided with that research, showing that gopher tortoises in range X followed the same aging trends. Further analysis showed greater similarity of range X tortoises to range VIa tortoises than range X tortoises to northern populations.

ROBERTO ALONSO-GUMA

The Power of Personalization: How Tailored Marketing Drives Consumer Engagement

Personalized marketing uses consumer data and advanced technologies to deliver highly individualized content and offers, reshaping traditional one-size-fits-all strategies. Over time, brands have transitioned from broad campaigns to data-driven efforts capable of catering to personal preferences. Consumer engagement evolves beyond basic clicks or purchases, encompassing emotional connection, brand loyalty, and sustained lifetime value. This thesis examines the evolution of personalization and investigates metrics to assess effectiveness. It also addresses the core strategies and ethical concerns of consumers alike. Ultimately, this work argues that personalized marketing significantly enhances consumer engagement and loyalty by creating individualized experiences grounded in responsible data usage and transparency, thus driving brand growth and a stronger return on investment.

SERENA AMRO GAZZE

Investigating the Neuroanatomy of Adult *Astyanax mexicanus* Using a Fully Segmented, Digital 3-Dimensional Brain Atlas

This research project presents the first-ever fully segmented, 3-dimensional brain atlas for the adult cavefish and surface fish variants of Astyanax mexicanus, a model species in evolutionary neuroscience. We used a combination of light sheet microscopy, tissue clearing, and manual segmentation to develop the comprehensive brain atlas. Then, we quantified and evaluated the volumetric differences between the fishesâ€™ related brain regions. Relative to surface fish, we found that cavefishâ€™s visual-processing brain regions (Optic Tectum and PGZ Layers) are smaller due to their blindness. Conversely, we found that cavefishâ€™s smell-processing brain regions (Olfactory Bulbs) are larger to compensate for their lost vision. These neuroanatomical volume differences, alongside several others we found, reflect the evolutionary adaptations between the Astyanax variants. This atlas is a significant tool for studying evolutionary and neurological processes, as it enables the Astyanax research community to further explore how ecological factors drive brain evolution and adaptation in vertebrates.

JOHNIYA ATTERBURY

Reducing the Amphetamine-Induced Oxidative Stress in *C. elegans* Using Quercetin

Amphetamine is a drug that alters the function of proteins uniquely expressed in the dopaminergic neurons, e.g. the dopamine transporter. Moreover, it elevates oxidative stress, so the body produces superoxide dismutase (SOD), which is an enzyme with antioxidant activity. Quercetin is a natural antioxidant found in fruit and vegetables. Here, we hypothesize that the elevated free radicals and sod-3 expression caused by amphetamine in C. elegans will be reduced by quercetin. A genetically modified line of C. elegans, wherein the dopamine transporter and the sod-3 genes are tagged with mCherry and GFP respectively, are being used to investigate the protective effects of quercetin by performing confocal microscopy. We predict that C. elegans treated with quercetin display a reduced amount of GFP, meaning less sod-3 expression and reduced oxidative stress. If confirmed, these findings suggest that quercetin can be used to counteract the oxidative stress caused by chronic use of amphetamine.

CRISTAL AUGER

One in a Million Shot: Novel genetic screen for genes involved in dopamine signaling

Altered dopamine (DA) signaling contributes to multiple brain disorders including Parkinson's disease, schizophrenia, autism and addiction. Proteins involved in DA signaling are highly conserved across species including the powerful genetic model Caenorhabditis elegans. To identify genes critical for DA signaling, we screened C. elegans lines from the Million Mutation Project (MMP) library, a resource of 2007 lines subjected to chemical mutagenesis and genome sequencing, for the DA-dependent phenotype swimming-induced-paralysis (Swip). Through an assessment of known patterns of gene expression, encoded protein structure, and predicted relationship to other genes known to control DA signaling, we have developed a prioritized list of DA signaling candidate genes. Interestingly, one of these genes (dhs-25) is predicted to dimerize with the protein encoded by dhs-11, a gene vital to DA neuron signaling and health (Refai et al., manuscript in prep). Ongoing efforts seek to identify the novel DA signaling contributor in each MMP line.

MIKAYLA BARKER

Technological Temptations: Examining the Academic Impact of Digital Distractions on Undergraduate Students

Technological distractions are increasingly prevalent in the academic environment, raising concerns about their impact on undergraduate students' exam performance. This study investigates the relationship between technological distractions, such as smartphones, social media, and other digital devices, and undergraduate students' exam performance. Along with recording course grade data, a survey was conducted among 480 undergraduate students on the study habits they recognized that needed to be changed. The data collected was analyzed to determine if there is a significant relationship between distraction as a behavior that needs to be changed and academic performance. The survey also seeks to understand students' awareness of the need to modify their habits to improve their grades. The findings from this study will provide insights into the extent to which technological distractions affect academic performance and suggest potential strategies to minimize their impact.

JESUS BECERRA

Wishful thinking: The powerful acts of ritual and tarot card divination when applied to psychotherapy

Tarot cards have been a powerful tool in cartomancy and divination methods across cultures. With strong symbolism and iconography present in the imagery of the tarot, notably the major arcana, the tarot can serve to bring forth areas of conflict into conscious awareness for resolution. Traditional healers, sometimes called diviners, shamans, and fortune tellers, have used divination to diagnose and treat the physical, psychological, and spiritual ailments of their clients, in many cases, following a ritual. The structure and relationship that the psychotherapeutic process shares with divination practices by traditional healers indicate that ritual and psychotherapy share similar goals, ideals, and functions with one another. This, in turn, opens the idea of using tarot cards and divination in the psychotherapeutic setting to incorporate a spiritual element and expand the cultural reach of psychotherapy.

CHANTAE BENNETT

The Role of Dsd in Regulating Insulin Producing Cells in Response to Glucose

Insulin signaling regulates metabolism, sleep, and aging in all animals, including humans. Disruptions can lead to diabetes, and insulin dysfunction increases the risk of neurodegenerative diseases. Despite extensive research, the mechanisms regulating insulin-producing cells (IPCs) are not fully understood. Our data suggests that activity of IPCs are modulated by the protein Attractin (ATRN), which has been linked to sleep, metabolic, and neurodegenerative disorders. We show that the Drosophila homolog, Distracted (Dsd), is expressed in the nervous system, IPCs, and other tissues. We reveal that Dsd has a cell autonomous role in IPCs that affects insulin signaling, sleep, and feeding behavior. We also present evidence that glucose ingestion but not a balanced diet promotes Dsd function, potentially driving the disinhibition of IPC and thereby increasing insulin release. Due to the conservation of ATRN function, our research aims to shed light on how ATRN dysfunctions contribute to metabolic disorders and other diseases.

LUKE EZRA BERG

Investigation of Bachman's Sparrow Habitat Preference and Site Fidelity in Relation to Prescribed Burns in Jonathan Dickinson State Park

The Bachman's Sparrow is a near-threatened songbird, endemic to the pine flatwoods of the southeastern United States. Habitat loss is the primary cause for decline in numbers in this species, magnified by their requirement for specific habitat characteristics to breed. Prescribed fires are used to maintain these requirements. However, burns during peak sparrow breeding season (Apr-Jun) may cause displaced males to permanently abandon their breeding territory. We monitored the population of Bachman's Sparrows in Jonathan Dickinson State Park 2016-19, 2021-24 weekly to verify their location from Mar-Jul of each year. Sparrows were primarily identified in suitable habitat in half of the years we studied. While most individuals were unaffected by prescribed burning, there were some instances of sparrow relocation and territory abandonment post-burn. Abandonments influenced by burns involved large burn extents and did not affect the ability of these individuals to breed but did prevent others from second nest attempts. This research will contribute to understanding how timing of prescribed burns influences habitat occupancy and breeding behavior in an imperiled songbird.

MADELYN BROOKER

Assessment of Endangered Key Deer (*Odocoileus virginianus clavium*) Population on Cudjoe Key, Florida Keys

Key deer (*Odocoileus virginianus clavium*) are an endangered white-tailed deer subspecies endemic to the lower Florida Keys, including Cudjoe Key (5 mi^2). Isolated from the main herd on Big Pine Key, the Cudjoe population, by 2000, had declined to <6 individuals. Translocation recovery efforts from 2003-2005 added 15 new individuals to Cudjoe (6 male, 9 female), and survey efforts in 2023 identified 15 males. My assessment used motion-detecting infrared trail cameras at 10 sites throughout Cudjoe Key, from September-December 2024, to observe, identify, and catalog individual male deer based on antler configuration. Overall, 33 males were identified, estimating a total population of 55 Key deer (using the Lincoln-Petersen model and estimated sex ratios) Â± 11 individuals. Additional insightful ecological data was collected, including Key deer range and movement on Cudjoe Key, foraging activity, male sparring, mating behavior, maternal care, and observations of other native species like birds and small mammals.

TATYANNA CAPUTO

Are Study Group Environments Related to Follow-Through on Study Plans?

Students may have a mental image of how they intend to study but fail to anticipate possible distractions or unexpected obstacles. A possible way to counteract this situation is for students to interact with each other in study groups. If students fear disappointing their fellow peers, they may be more likely to fulfill their intended plans. In addition to helping students follow through, studying in groups may help students adopt more active study strategies like quizzing each other and explaining topics in their own words. In this study, college students reported their upcoming study plans, which were then analyzed to see if students planned to work with others and use stronger study strategies. We correlated their plans with the students' later self-reports on follow-through and study strategies. It is expected that study groups will lead to greater success with follow-through and the application of active study strategies.

JACOB CARLSON

Quantification and Characterization of the Microbiome of the Edible Halophilic Succulent Suaeda Linearis

This presentation will give a brief introduction to the use of Graph Theory to visualize and analyze biological data – such as metagenomics. The term "omics" in Biology refers to the study of the collective characterization and quantification of entire sets of biological molecules. A vast array of biological topics can be thus further analyzed under this term – such as proteins, RNA molecules, metabolites, and genes and genomes. Genomics is the study of all of the DNA in an organism, and how that genetic information is applied within the cell. Furthering this definition, metagenomics is the study of all of the DNA present in a large sample size – typically from a microbiome. Higher level mathematics can give a deeper insight into these biological data. The use of Graph theory can provide a more profound analysis of data, and can additionally be utilized to create a more visual approach to the data.

ANDREW CHAMBERLIN

Validation of Novel Screening Platform for MMP Substrate Specificity

Matrix metalloproteinases (MMPs) play key roles in tissue remodeling, immune function, and wound repair, but their dysregulation is linked to diseases like cancer and fibrosis. Understanding MMP substrate specificity is essential for developing targeted therapies. This study examines the substrate preferences of eight MMPs by analyzing their enzymatic activity on fluorogenic triple-helical peptide fTHP-15 variants. Variations at eight peptide positions are screened to assess their impact on MMP processing efficiency. Peptides are synthesized via solid-phase peptide synthesis and evaluated using fluorescence resonance energy transfer (FRET)-based enzymatic assays. Enzymatic activity, measured as Relative Fluorescence Units (RFU), is normalized to the fTHP-15 reference peptide. High-performance liquid chromatography (HPLC) quantifies peptide cleavage, while circular dichroism spectroscopy assesses peptide thermal stability. The findings will provide insight into MMP substrate preferences, improving the understanding of MMP function and informing therapeutic development for diseases involving MMP dysregulation.

RISHI CHHIBBER

Covalent Screening of Compounds That Bind to Disease Causing RNAs

Myotonic dystrophy type 2 is a genetic disease caused by the CCUG repeat expansion in the CNBP gene. This causes RNA and proteins produced by the gene to sequester other RNA binding proteins, altering pre-mRNA splicing and causing symptoms such as muscle weakness. Additionally, Myotonic dystrophy type 1 is caused by similar conditions, with a CUG repeat expansion in the DMPK gene, causing similar symptoms. Small molecules can be used to bind to these repeat expansions and prevent them from being expressed. To find these small molecules, a new high-throughput screening assay was developed, which uses UV-induced cross linking to find RNA binding molecules. Conditions for this assay have been optimized and a library of compounds were screened and validated, identifying small molecule binders for both myotonic dystrophy type 1 and type 2. This method allows for the discovery of RNA-targeting drugs that can be used for disease related RNAs.

SAM COHEN

Mapping the Intron/Exon Boundaries of the TLR4 Gene in Gopher Tortoises (*Gopherus polyphemus*)

Gopher tortoises (*Gopherus polyphemus*), a keystone species in the Southeastern United States, are increasingly threatened by habitat loss, climate change, and disease. Despite playing a critical role in combating infections such as Upper Respiratory Tract Disease (URTD), their immune system remains poorly understood at the genetic level. A significant knowledge gap exists in the structure of the Toll-Like Receptor 4 (TLR4) gene, a key component of the immune system responsible for recognizing pathogens and initiating immune responses. This study aims to map the intron and exon boundaries of the TLR4 gene in Gopherus polyphemus using Sanger sequencing, providing a comprehensive framework for understanding gene function and polymorphisms. This research will provide a foundation for understanding how variations within TLR4 influence disease susceptibility and immune resilience. The findings will contribute to conservation efforts by identifying genetic markers for disease resistance, which can help guide population management in the future.

EDEN CUDAK

Cytochrome P450 Seven-Inhibitor Cocktail

Cytochrome P450 enzyme (CYP) activity can be measured via a CYP inhibition assay, which determines a compound's ability to inhibit the activity of a CYP enzyme by evaluating the decrease in the rate of a known substrate's metabolism. Our lab employs an existing CYP cocktail protocol that targets four enzymes: CYP1A2, CYP2C9, CYP2D6, andCYP3A4. The goal of this project is to expand that test to include three more enzymes; CYP2C19, CYP2C8, and CYP2A6; which would broaden the scope of the assay. The expected outcome is a functional and efficient CYP cocktail inhibition assay that uses seven substrates simultaneously to measure the change in metabolic activity. Assessing a compound's ability to inhibit a specific enzyme is essential when testing for drug-drug interaction or interference, and the method developed in this project will provide a way to evaluate these interactions. This will be a useful tool for drug development testing.

KAYLA DIFEDE

Investigating the ECM's Influence on Synapse Regulation

This project examined C1q's distribution in the extracellular matrix (ECM) and its specialized structures, perineuronal nets (PNNs), to explore potential functions beyond its well-established role in synaptic pruning. Traditionally, C1q deposits at tagged synapses, initiating the complement cascade and signaling microglia to remove them. Preliminary data indicate that C1q accumulates in the ECM, suggesting additional functions. In fact, initial observations indicate that most C1q clusters were not directly associated at the synapse. Using microscopy with fluorescent synaptic markers (Gephyrin-GFP, Homer-GFP), we assessed C1q's spatial distribution relative to synaptic sites. To determine whether the ECM influences synapse tagging, we compared inhibitory parvalbumin (PV) neurons with and without PNNs to assess whether PNNs affect C1q tagging. This allowed us to evaluate whether PNNs offer an environment that protects synapses from C1q deposit. Ultimately, this study aimed to clarify C1q distribution in the ECM and whether PNNs modulate synapse regulation.

ALEXANDER FERNANDEZ

Characterization of Rhes and SLC4A7 Binding in Striatal Cells

Huntington's Disease is a neurodegenerative disorder in which affected individuals slowly lose motor skills, experience cognitive decline, and ultimately lose their lives. While treatments exist to help individuals with Huntington's symptoms, there is no cure or treatment for the neurodegenerative process itself. Rhes is a striatal protein that has been found to have a role in regulating motor activity, and has been found to bind to mutant Huntingtin, the gene that causes the onset of Huntington's. SLC4A7 is an intermembrane protein that was discovered through mass spectrometry to bind often to Rhes in Huntington's cells. By characterizing the domains at which SLC4A7 binds to Rhes and finding the mutants of Rhes that SLC4A7 binds to, it may be possible in the future to treat patients with Huntington's by inhibiting the function of SLC4A7 with a therapeutic drug.

MIA L. GOMEZ

Evaluating Fish Community Structure Along A Bermudian Lagoon Seascape

Population dynamics of fish communities depend on predator-prey distribution, environmental factors such as tidal cycle, and anthropogenic activity. This study utilizes underwater camera systems as an effective tool to passively monitor fish assemblages and track forager activity across time and habitats. For this project, I quantified the diversity of demersal fish communities across the lagoon seascape of Harrington Sound, Bermuda, by analyzing continuous photo surveillance collected over 11 days in 2024 at three sites characterized by a variety of habitats: Seaside (north lagoon), Gibbets Island (inlet), and Green Bay (inshore sound). Species presence, abundance, and foraging behavior were recorded relative to fish communities at each site, with a focus on mesopredators. Preliminary results suggest variable mesopredator presence across sites, with Green Bay having the greatest abundance of mesopredators compared to Gibbets Island and Seaside. These observations demonstrate the importance of benthic, sandy-bottom ecosystems as a hotspot for mesopredatory fishes.

TRISANN GORDON

Environmental Reservoirs for Bacteria in Gopher Tortoise Habitats: Investigating Soil and Fecal Microbial Dynamics

This study investigates the transmission of Helicobacter, a potentially harmful bacterial species that colonizes the gastrointestinal tract, and other bacterial taxa in gopher tortoise (Gopherus polyphemus) populations. Gopher tortoises, a protected keystone species, face significant threats from habitat loss and disease. Previous research has identified Helicobacter in their fecal microbiome, raising questions about how these microbiomes are acquired. This study aims to determine the presence of Helicobacter and explore similarities between the fecal microbiome and the burrow soil microbiome, offering insights into bacterial transmission. Using Whole Shotgun Genome Sequencing and 16S rRNA gene barcoding, bacterial communities in burrow soil and feces will be analyzed to detect potentially pathogenic bacteria, with a focus on Helicobacter. The findings will provide valuable insights into tortoise habitats and inform conservation strategies by identifying potential environmental reservoirs that contribute to the exposure and transmission of pathogens in gopher tortoise populations.

BRIANA GRANITTO

Morphological Development of Neuronal Projection Growth During Early Cortical Network Formation

Early neuronal development requires dendritic and axonal growth and refinement. In the mature visual cortex (V1) of many species, cells that respond to the same stimulus are grouped together in a modular arrangement. Previous studies suggest that exposure to sensory input prompts refinement and function of cortical networks. This project examines how morphological changes in neuronal processes, such as dendrites and axons, relate to the organization of modular networks, focusing on patterns in their growth both before and after sensory input. We imaged sparsely labeled cells from layer 2/3 of V1 in tree shrews across different ages. We focused on three specific age groups: pre-modular (<P15), post-modular (P15-P20), and after eye-opening (>P21). Our results reveal that total dendritic length increases after modular networks have formed, while branch complexity remains stable across several methods of measurement. Future work will examine axonal stability across these critical stages of network development.

SHYLA GRANT

Understanding Microbial Adherence to Plastics

In the environment, bacteria adhering to surfaces provide a special advantage where substrate competition is fierce. Pathogens can also stick to plastics due to the oily nature of host cells and plastics. We have identified a gene set, Mannose-Sensitive Hemagglutinin (MSHA) known to be necessary for adhesion to host cells, that is crucial for plastic adhesion. This study explores the relationships of adhesion on hydrophobic substances with amino acid similarity and protein structures of one key gene (mshA) that interacts with substrates. Employing attachment assays to determine strength of adhesion combined with amino acid sequence analysis depict adhesive properties on plastics. Amino acid sequences have been modeled to characterize residues responsible for strong attachment properties. Altogether, organisms with similar adhesion strengths to hydrophobic substances have more related amino acid sequences and protein folding. Our results have applications ranging from food-prep to biomedical safety, where controlling bacterial adhesion is crucial.

ALYSSA GREEN

Long-term Neurobehavioral Impact of Prenatal Oxycodone Exposure

Chronic use and misuse of opioid drugs has contributed significantly to the ongoing opioid epidemic. Pregnant women using opioid drugs present an additional risk for the offspring, affecting their growth and development. The long-term effects in adults, however, are not well understood. This study in mice investigated the behavioral and neurobiological impacts of prenatal exposure to oxycodone in adults. We found heightened risk-taking and impaired behavioral flexibility, characteristic of an impulsive-like phenotype, in adult males, but not females, with prenatal oxycodone exposure. We then used monosynaptic retrograde tracing to map brain-wide inputs to the orbitofrontal cortex (OFC), a region involved in value judgment, decision making, and behavioral flexibility, and found that male mice with prenatal oxycodone exposure showed hyperconnectivity between the OFC and the basolateral amygdala (BLA), a region involved in valence processing. Chemogenetic manipulation of BLA to OFC circuit confirmed a link between altered brain connectivity and impulsive-like behavior.

KALANI HERNDON

Infant Preferences of Toy Stimuli During a Stressful Condition and the Relationship to Temperament

This study examines how traditional and feedback toys influence infants' temperaments across different age groups (10, 12, and 14 months). It is hypothesized that feedback toys, which produce electronic sounds or movement in response to manipulation, will enhance engagement and emotional regulation more effectively than traditional toys. Using electroencephalogram caps, the timing of the infants' reactions to each toy type is measured while mothers complete an Infant Behavior Questionnaire-Revised survey. To determine if there is a significant difference between the two groups, an Analysis of Variance (ANOVA) test is performed. Anticipated results from 12 infants, four from each age group, suggest feedback toys lead to higher engagement and reduced distress within shorter periods. These findings contribute to understanding how early environmental stimuli shape long-term cognitive and emotional development. Infants who develop inhibitory control over new stimuli may demonstrate improved focus and mental performance later in life.

BLAIZE HICKS

Floral Survey of Eastern John D. MacArthus Campus

This study conducted a floral survey of the easternmost section of the John D. MacArthur Campus of Florida Atlantic University (FAU), the only remaining undeveloped area on campus. The goal was to provide a benchmark for this impacted and under-managed vegetation. A previous survey of FAU's Ecological Preserve found ~40% of plant species were non-native (Austin 1990). For this project, geo-referenced photographs of plants were taken and uploaded to iNaturalist, where AI provided initial identifications. Expert-confirmed identifications were considered "research grade." Over five months, 288 observations were posted, with 230 observations of 65 species achieving research grade. Combined with others' verified observations, a total of 77 plant species were recorded, ~38% of which were non-native. These results offer a reference for future studies of similar areas and highlight contrasts with more studied preserves, such as the nearby gopher tortoise preserve, which has ~27% of plants non-native species.

MORIAH HOLLAND

Small Molecule Inhibition of NRF2 to Treat Lung Cancer

NRF2 is a transcription factor and master regulator of genes associated with cellular quality control and the antioxidant response. In normal cells, basal levels of NRF2 are low. However, in 33% of lung cancers, NRF2 is overexpressed, leading to cancer cell proliferation and chemoresistance. Here, we search for NRF2 inhibitors that block the interaction between Maf transcription factors and NRF2, rendering NRF2 inactive. A recent high throughput screen revealed a compound with moderate biochemical and biophysical potency for NRF2. To improve the potency and selectivity of C5 for NRF2, we will leverage medicinal chemistry and biochemical assays to optimize C5 derivatives. The purpose of this compound is to act as stand-alone or adjuvant therapy that will increase lung cancer cell death to treat NRF2 high cancers.

LENS JEANNOT

PhyA Gene Abundance and Its Role in Calcium Absorption in Gopher Tortoises

Calcium bioavailability is a critical factor in the health and survival of gopher tortoises (Gopherus polyphemus), a keystone species vital to maintaining biodiversity in their ecosystems. Phytate, a common phosphorus storage compound in their plant-based diet, binds calcium, reducing its absorption. This study explores the role of the PhyA gene, which encodes phytase, a key enzyme that breaks down phytate and liberates calcium within the gut microbiome of gopher tortoises. Fecal samples DNA sequence analysis determined diversity of plant and bacterial PhyA gene sequences present in the gut microbiome. The analysis also investigated potential sex-based differences in the occurrence of PhyA genes and their implications for calcium absorption efficiency. These findings inform conservation strategies, including dietary interventions and habitat restoration, to optimize the microbiome health of this endangered species. However, conclusions remain tentative as ongoing research will further clarify the gene's role and its origins.

PAITYN JOHNSTON

A Comparison and Preliminary Analysis of Sexual Dimorphism of the Gut Microbiome in the Gopher Tortoises (Gopherus polyphemus) of Southeastern Florida

The Gopher tortoise (Gopherus polyphemus) is a keystone species that is endemic to the southeastern United States, which supports over 350 species. Populations have declined immensely due to urbanization, disease and other factors that have led to the species being classified as threatened by the state of Florida. There are few studies discussing the gopher tortoise gut microbiome and even less that examine the differences of microbial abundance between sexes. Previous results suggest that female gopher tortoises have a higher abundance of carbohydrate fermenting taxa. This study aims to compare and begin analysis of the differences in relative abundance of microbial taxa between male and female gopher tortoises of the Abacoa Greenway in Jupiter, Florida using fecal samples, native barcoding, and NanoPore sequencing. These results will add to the understudied topic of tortoise gut microbiomes, which will expand upon known indicators of health and conservation efforts within urban matrices.

AVINASH KANAKAM

Characterizing Nos1 neuron activity in non-homeostatic feeding behaviors

The activity patterns of neurons are what form the physiological basis that underlies different behaviors. In this project, we hypothesize that the Nos1 neurons of the Insular Cortex are behind the extra relevance we give to certain food stimuli, leading to non-homeostatic feeding behaviors, such as overconsumption. To prove/disprove this hypothesis, the objectives of this project are to: 1. Create a workflow that utilizes a combination of behavioral video data and neuronal calcium recordings to draw correlations and 2. Apply the aforementioned workflow in the Insular Cortex alongside overconsumption task recordings to find associated subpopulations of neurons. In using this behavioral data alongside neural activity recordings, we found a subpopulation of excitatory neurons in the Insular Cortex which are correlated with eating behaviors. In the future, these methods present a consistent way of being able to identify clusters in neuronal populations associated with different behaviors.

ALICE KIM

Effects of Embryonic Nisoxetine Treatment on C.elegans Using the SWIP Assay

Nisoxetine, a selective norepinephrine transporter (NET) inhibitor, operates in Caenorhabditis elegans worms by antagonizing the dopamine transporter (DAT-1), leading to elevated levels of dopamine (DA) in the synaptic cleft which triggers the SWIP response, characterized by paralysis during swimming. The Swimming-Induced Paralysis (SWIP) assay in C.elegans is used to study dopamine-dependent motor functions and evaluate the influence of dopamine signaling on their swimming behavior. In this study, we investigated the effects of embryonic nisoxetine treatment on dopaminergic motor function using SWIP in C. elegans. This study builds upon previous work utilizing amphetamine pretreatment, a well-known stimulant that promotes the release of dopamine. While amphetamine is beneficial for investigating dopaminergic neurons, its action might not exclusively target DAT-1. Nisoxetine offers a more targeted approach and by pretreating embryos with this drug, we anticipate observing a dose-dependent increase in the frequency and severity of the SWIP response.

TAHCHUR KIM

Transcriptional Response to Estrogen Receptor Ligandsâ€‹ in Tamoxifen-Resistant Breast Cancer Cells

Breast cancer growth in estrogen receptor (ER)-positive cases is driven by binding of estrogen to ER, a transcription factor for breast development. The Y537S mutation promotes constitutive activity of the ER receptor, promoting agonist-independent transcriptional activity and metastasis. This constitutive activity is associated with alterations of chromatin structure where recruitment of ER to chromatin by certain regions results in uncontrolled cell growth that eludes conventional hormone therapies such as tamoxifen. We studied resistance mechanisms by screening 11 adamantyl ligands for inhibition of growth on tamoxifen resistant ER-Y537S cells. Differentially expressed genes linked with ligand treatments were identified using RNA-seq. Linear regression analyses provide evidence for biological pathways in which expression of the targeted genes may correlate with inhibition of cell growth. The findings help to uncover mechanisms of resistance to breast cancer drugs and contribute towards the design of more potent therapeutic treatments for hormone insensitive breast cancers.

MARLI KNOX

An Inverse Agonist of the 5-HT2A Receptor Offers Non-Hallucinatory Modulation of Fear Memory Extinction in Adult C57BL/6J Mice

Severe anxiety and fear can result from traumatic, life-threatening experiences, often leading to Post-traumatic Stress Disorder (PTSD). This overwhelming fear can take control of an individual's life, making it difficult to manage daily activities, prompting many to seek treatment. Fear extinction, refers to a neurobiological process in which new learning reduces the expression of persistent fear responses that emerge after trauma. Stimulation of 5-hydroxytryptophan (5-HT) 2A receptors (5-HT2AR) by hallucinogenic compounds has been shown to promote fear extinction in both humans and animals. Hallucinogenic and non-hallucinogenic agonists activate 5-HT2ARs in different ways. MDL11-939, which targets both 5-HT2A and 5-HT2C receptors, blocks the effects of hallucinogenic compounds on fear extinction. In contrast, MDL 100,907, a non-hallucinogenic 5-HT2AR antagonist, offers 80 times greater selectivity for 5-HT2AR over other serotonin receptor subtypes, providing greater specificity than MDL 11,939. We aim to investigate the effects of MDL 100,907 on fear extinction in comparison to MDL 11,939 to better understand the role of 5-HT2AR in PTSD-like behaviors.

BRIA KUNTZ

Cause and Regionalization of Sublethal Injuries to Juvenile Giant Manta Rays (Mobula birostris) off the Southeastern Florida Coast

Working with the Marine Megafauna Foundation, surveys of a juvenile population of the endangered Giant Manta Ray (Mobula birostris) show a range of injuries occurring off the southeastern coast of Florida. Over the eight-year study period (2016-2024), 92 individual mantas were observed with injuries, some individuals having up to 12 injuries over the study period. Analysis of GoPro footage revealed a total of 212 injuries with the majority being anthropogenic. The causes of injuries were classified into categories: propeller scars (15%), skegs (10%), fishing line (23%), lures/hooks (23%), predatory bites (9%), or unknown (20%). This study also observed body regionalization, dividing the manta anatomy into four distinct proportional regions: head (7% total area), body (37%), pectoral fins (52%), and tail (4%). The frequency of different injury types compared to the proportional area of each region showed significantly more injuries for the head (21%) and body (14%).

LOÏC LA-BRANCHE

Fuel of the Future: Biodiesel Synthesis

In the face of mounting climate and energy crises, the employment of eco-friendly resources is critical. The green initiative for fuels demands a renewable, economic resource with minimal carbon footprint and toxicity. Biodiesel, sourced from the reactions of natural oils and alcohols through transesterification, has gained acute attention as a sustainable alternative to petroleum with appreciably lower carbon and greenhouse gas emissions. The industrial transesterification process, however, is limited by its catalysts which require water-free and relatively pure raw material. This quality of homogenous, transesterification catalysts constitutes more than 70% of the cost for biodiesel production, ultimately lending biodiesel a higher cost compared to petroleum-based diesel. In this project, we aim to engineer heterogeneous catalysts derived from metal organic frameworks, whose properties allow for the use of lower cost feedstock, the improved economic viability of biodiesel and a lasting benefit to the environment.

MARIA LARGAESPADA

Enhancing electro-deformation spectroscopy with machine learning for automated red blood cell morphological analysis

Reduced red blood cell (RBC) deformability characterizes many blood disorders and chronic health issues. Electro-deformation spectroscopy (EDS) is a novel method that measures single-cell deformation across electrical frequencies in a microfluidic device to extract mechanical and electrical properties simultaneously. Previously, spectrums were obtained by time-consuming semi-manual cell segmentation in ImageJ. To automate this process, a python algorithm using a Mask R-CNN deep learning model was developed for automatic cell segmentation. Detected RBCs are fitted with ellipses using OpenCV to extract key metrics, including area, perimeter, and axis diameters. The Elliptical Shape Factor (ESF), which quantifies RBC deformation, is calculated automatically. Cellular centroid coordinates enabled tracking across electrical frequencies. The algorithm achieves 94% accuracy in calculating ESF and measures major and minor axes within 0.8 and 0.2 micrometers. This machine learning enhancement improves EDS efficiency, allowing faster assessment of biophysical markers reflective of cellular pathophysiological states to understand disease progression and medical treatment efficacy for blood disorders.

JAMES LEE

An In Silico investigation of induced target neural activity through Simulation-Based Inference Informed Deep Brain Stimulation

Deep Brain Stimulation (DBS) is clinically effective for various neurological disorders, yet its underlying neuronal mechanisms remain incompletely understood. Building on previous studies, we used an in-silico Hodgkin-Huxley calcium model to investigate hippocampal CA1 responses to 40 Hz and 140 Hz DBS. Our simulations replicated key experimental findings, confirming robust somatic depolarization at 140 Hz and a more gradual ramp at 40 Hz, alongside distinct transient and sustained voltage profiles. Both frequencies modulated firing rates, supporting the notion that DBS disrupts pathological network activity. Beyond frequency-specific effects, we employed Simulation-Based Inference (SBI) to identify the DBS amplitude needed to suppress spiking and match a quiescent target neuron. These results demonstrate how in-silico approaches can elucidate DBS-induced membrane dynamics and underscore SBI's potential for optimizing neuromodulation strategies.

SAMANTHA LEONARD

Genetic Regulation of Sucrose Feeding in Drosophila melanogaster

Feeding is a fundamental animal behavior; genetic and neuronal regulation of feeding behavior is of interest for behavioral, genetic, and neurobiology research. The fruit fly, Drosophila melanogaster, is an excellent model for investigating mechanisms that regulate feeding behavior because many human genes have Drosophila orthologs that are likely to operate similarly and potentially relate to human disease. Feeding is a complex behavior and its genetic regulation is not completely understood. Using a single gene screening approach, we previously identified candidates that affect consumption of high or low sucrose concentration diets. Here, we validated these gene hits using mutants and RNAi downregulation of candidate genes by comparing their feeding behavior using the Activity Recording CAFE (ARC) assay in adult males. This research reveals genetic mechanisms that alter different aspects of feeding or prandial behavior.

ALEXANDER LOPEZ

Assessing the Combined Effects of Spironolactone and Deydro-Cortistatin A on HIV Expression

HIV remains a significant challenge due to its ability to establish latent reservoirs in CD4+ T cells, requiring lifelong antiretroviral therapy (ART). This ongoing study investigates the effects of spironolactone (SP) and dehydro-cortistatin A (dCA) on HIV expression, both individually and in combination, using JLAT9 and JLAT15 cell models. Cells were treated with SP (10 Î¼M), dCA (20 nM), and a combination of both drugs in a longitudinal study, with samples collected at multiple time points. Preliminary results indicate that both SP and dCA individually suppress HIV expression compared to the control. However, the combination treatment has not demonstrated any additional suppression beyond the effects observed with the individual drugs. These findings, while preliminary, suggest that SP and dCA may have therapeutic potential individually, but further investigation is required to assess their combined effects.

GABRIELLA MAXEY

Whole-brain Mapping of Neuronal Interleukin-1 Type 1 Receptor in the Mouse Brain

The pro-inflammatory cytokine interleukin-1 (IL-1) has diverse functions within the brain such as facilitating memory and regulating sleep, yet is linked to various psychopathological disorders including depression, anxiety, and PTSD. The IL-1 type 1 receptor (IL-1R1) is the sole receptor of IL-1 and is predominantly expressed on non-neuronal cell types in the brain; however, the existence of IL-1R1 on neurons has been debated due to inconsistent mapping attempts. Here, we generated a specific atlas of neuronal IL-1R1 (nIL-1R1) distribution throughout the brain in global and glutamatergic-neuron-specific IL-1R1 reporter mice. Using immunohistochemical labeling and the QUINT workflow, we show nIL-1R1 is primarily found in brain regions related to sensory processes. Further, we directly stimulated nIL-1R1 with intracerebroventricular IL-1 injections to investigate the receptor's activity. Our results expand the knowledge on the cytoarchitecture of brain nIL-1R1 and kinetics of the receptor's responsiveness, which could be crucial for understanding IL-mediated neuroinflammatory disorders.

RYAN MAYER

Identifying Conserved MAPK Regulators of Opioid Signaling Networks

Opioids provide pain relief through activation of mu opioid receptors (MOR), a G protein-coupled receptor (GPCR) throughout the central nervous system. However, the ability of MOR to co-activate various signaling pathways, such as mitogen-activated protein kinase (MAPK) pathways, has been linked to adverse effects. With the goal of making opioid treatments safe, we aim to identify genetic regulators that divert opioid signals away from MAPK pathways. We previously designed a cell platform for studying MOR-MAPK signaling using Saccharomyces cerevisiae – a yeast model with highly conserved MAPK elements to humans. We have shown this platform can report changes in MOR-MAPK signaling with single-cell resolution. Next, we will deploy this platform in a high-throughput CRISPR interreference (CRISPRi) screen for conducting a genome-wide search of MOR-MAPK regulators. Upon completion, we anticipate new opioid regulators will be revealed that may be pursued for improving the efficacy and safety of clinical opioid use.

MADISON MCADOO

Fungal Communities Living Inside Gopher Tortoise Burrow Microhabitats

Fungi play a key role in the ecosystem as decomposers who assist in recycling nutrients or are potentially pathogenic. Gopher tortoises (Gopherus polyphemus) are keystone species whose burrows provide shelter and protection to over 350 other species, however, they are a threatened species. Currently, little is known about the specific species present in the burrows or whether the diversity of species differs along the length of the burrow. In an attempt to help conservation efforts, this study focuses on their burrows and the fungi living within them by taking soil samples from dry, occupied burrows and at different depths and parts of the burrow. Then using the soil samples, DNA will be isolated and characterized using 18S rRNA gene sequence barcoding and long-read metagenomic DNA sequencing, followed by phylogenetic analysis. The results will yield important information about fungal diversity in tortoise burrows and how it varies with depth.

GWENDOLYN MURRAY

Turning Over a New Leaf: Veterans' Perspective on Mental Health After Wilderness Therapy

Research shows a high prevalence of psychopathology among veteran populations. Despite this, veterans seek treatment at limited rates. Wilderness therapies have grown in popularity as an alternative treatment, displaying promising relief from psychopathological symptoms. Our study aimed to examine alternative aspects of mental health targeted by 3.5-day Huts for Vets wilderness therapy trips. Participants completed self-report measures of social behaviors and attitudes, openness to other psychological treatments, and use of and benefits from coping skills such as mindfulness and yoga. Two groups were compared: a control group of 23 veterans in veteran affiliation groups and a Huts for Vets group of 20 veterans assessed several months post-trip. An independent sample t-test revealed that the control group reported lower treatment openness, social behaviors and attitudes, and coping, when compared to the follow-up group. Overall, suggesting that wilderness trips may promote positive behaviors that work to reinforce veterans mental well-being.

BAILEY PALMER

Impact of Resveratrol Derivative Resveramorph-3 on Drosophila Models of Alzheimer's Disease

Alzheimer's Disease is characterized as a class of dementia that has a range of symptoms that negatively impact cognitive abilities and function. This disease can be correlated to aging and is caused by the loss of the function to cleave Amyloid Precursor Protein, forming amyloid plaques within the brain, damaging neuron function. In Drosophila melanogaster, the symptoms of this disease are very similar to symptoms in humans, making them a great model for understanding this disease. The experiment tests the lifespan of mature Drosophila when living with Alzheimer's Disease with no intervention then with a derivative of the antioxidant drug Resveratrol, named Resveramorph-3 (RVM-3), determining the impact of the disease on each organism and if the drug can act as a therapeutic treatment for those living with Alzheimer's Disease.

ISABELLA PASSANISI

Coral Survivorship in Relation to Benthic Interactions

Coral reefs are being affected by more prolonged and severe thermal anomalies due to climate change, which results in a higher degree of coral diseases and mortality. However, it is unknown how species interactions and coral reef structures change after thermal anomalies. This thesis aims to evaluate if coral survivorship is affected by benthic interactions. Coral survivorship was determined in relation to other benthic organisms using underwater transects on Fort Lauderdale and St. Croix reefs over a fifteen-year period. Preliminary results show that hard corals survive better in intermittent or permanent interactions with other benthic organisms than when corals are solitary. Understanding these patterns can inform future predictions of coral ecosystem responses to climate change and aid restoration initiatives.

AVA PITTS

A Pathological Investigation of Cetacean Respiratory Disease: Insights from Strandings along the Southeastern Florida Coast

Stranded cetaceans frequently present respiratory abnormalities at necropsy. The purpose of this study was to investigate the respiratory pathology of 47 cases of stranded cetaceans along the southeastern coast of Florida from 2013 to 2024. Complete necropsies were performed along with histological analysis. Of the 47 strandings, 32 (68%) had at least one type of respiratory pathology. Of these strandings, the most common respiratory pathologies found were pulmonary edema (48.4%), fibrosis (44.68%), and atelectasis (40.43%). Comparing the strandings between adults and non-adults, p-values suggest that congestion ($p=0.0117$) and fibrosis ($p=0.0185$) were more commonly found in adults. Strandings from the Indian River Lagoon exhibited more respiratory cases of lung parasites ($p=0.0003$), pneumonia ($p=0.0047$), lymphadenopathy ($p=0.0036$), and fibrosis ($p=0.0036$), than from the Atlantic. Understanding respiratory health may aid in conservation efforts for these species.

SURINA PREM

School-Based Interventions for ACEs Using the SNAP Framework

One evidence-based intervention called SNAP (Stop, Now, And Plan) helps children identify their triggers, recognize their emotions, and choose plans to cope with and reduce behavioral problems. When a child experiences or witnesses abuse at a young age, it can significantly alter their mental and physical health, making early intervention crucial. Addressing trauma while the brain is still developing helps prevent long-term issues, breaks the cycle of generational trauma, and fosters healthier relationships. Unfortunately, mental health care is not affordable for everyone, creating a significant disparity between those with access to these services and those without. By implementing school-based interventions it can help children on a larger scale who are in need of services. It is important to determine the effectiveness of SNAP compared to other school-based interventions and assess what makes a program more successful than others. Additionally, I will be evaluating school-based interventions like SNAP and determining if they are more cost-effective.

ALLISON REESE

Predictive Popularity Possibility: Predicting Netflix Popularity in South Korea

Dr. Jacqueline Fewkes and Saturn Vogeley investigated the influence of countries of origin on South Korean Netflix TV shows and movies. As such, the aim of these researchers was to use this data to analyze the popularity of South Korean media in other Asian countries on the platform. This examination attempts to estimate the popularity as two proxies relating to the given top rank and the number of weeks present in the top 10. Combined statistical methods were implemented in this endeavor, most notably Chi-squared, the Regression Specification Error Test (RESET), and general linear models (GLMs). The analysis warrants better approaches to formulating predictions for multivariate categorical data.

JOSHUA REYNOLDS

The Spatio-Temporal Role and Effect of Glucose on Distracted (Dsd) Protein Expression and its Endolysosomal Trafficking

Attractin (Atrn) is a transmembrane protein linked to neurodegeneration, obesity and metabolic disorder whose homolog within Drosophila is Distracted (Dsd). Previous research has displayed a potential spatio-temporal correlation between glucose and Dsd regulation. Through study of this correlation as well as Dsd role in Insulin Producing Cells and G-protein coupled receptors, further insight can be gained on metabolism and neurodegeneration. For spatio-temporal protein and glucose identification, western blots, immunohistochemistry/confocal are utilized. Distracted as well as glucose through food intake have spatio-temporal roles in metabolism and neuronal regulation in both the gut and the central nervous system. With these results insight will be gained into Attractin's and glucose's behavior and role in metabolism.

LAUREN REYNOLDS

SNAP® Youth Behavioral Intervention

Adverse Childhood Experiences (ACEs) are potentially traumatic events, such as violence, abuse, neglect, and household dysfunction, that affect individuals under 18. These experiences can disrupt brain development, hinder learning and classroom behavior, and increase the likelihood of mental and physical health issues later in life. Stop Now and Plan (SNAP®) is a 13-week early intervention program for children ages 6-11 exhibiting serious disruptive behaviors and their caregivers. This evidence-based program utilizes a cognitive-behavioral framework to enhance emotional regulation, self-control, prosocial behavior, and problem-solving skills through group discussions, role-playing, and homework activities.

ALAINA RUMRILL

Igniting Serotonin: Sources and Receptors in the Fire Sponge Tedania ignis

Sponges (*Porifera*) are one of the two major animal lineages that do not contain a nervous system, representing a "pre-neural stage" of evolution. Recent studies have identified neurotransmitters in sponges, particularly serotonin, suggesting potential serotonergic activity. However, sponge associated microbes, not sponge cells, are suspected to be the true source of neurotransmitters. This thesis investigates the origin of serotonin in the sponge Tedania ignis by using a Percoll gradient to separate sponge and bacterial cells, followed by an ELISA kit to quantify serotonin in each fraction. To explore Porifera's evolutionary relationship to neural systems, PCR and DNA analysis were employed to examine the presence of Tph, Tph1, Tph2, and Trh genes in the genome of Tedania ignis. The findings aim to clarify whether serotonin in sponges is produced by the host or its microbial symbionts, contributing to the broader understanding of their evolutionary lineage.

CAMILA SAMPAIO

Roman Spectator Takes on Violence and Bloodshed in the Combat Sports of the Colosseum

This project aims to analyze Roman views on the violent bloodshed in the Colosseum games. To do this, a literature search with texts such as David Potter's The Victor's Crown: A History of Ancient Sport from Homer to Byzantium was performed. These texts were read and annotated in the early stages of the research project and later dissected for relevant information. A T-chart was made—one side of which was for evidence displaying support for violence, the other for evidence suggesting disdain towards bloodshed—to compare evidence. Textual evidence suggests that Romans found enjoyment in the violence of games to an extent, though not always purely for its own sake. Additionally, the behavior of the crowds and their attitudes can be seen to tie back heavily to their culture and even the foundations of Rome.

GAEL SANON

From High Ground to Flooded Terrain: Vertebrates in Gopher Tortoise Microhabitats

Gopher tortoises (Gopherus polyphemus) are a keystone species that impact ecosystems through their burrowing behavior. In the Abacoa Greenway, they create burrows in upland habitats, including slash pine and scrub flatwoods, often relocating to higher ground to avoid seasonal flooding in adjacent low-lying areas. Gopher tortoises share burrows with vertebrates who utilize them for shelter and protection. Periodic flooding is expected to influence the diversity and composition of the vertebrate species that reside in the flooded burrows vs. the non-flooded burrows. This study compares the difference in vertebrate species in the flooded vs non-flooded burrows. To test out my hypothesis, soil samples will be collected at depths from 3ft to 6ft. DNA extraction will be performed, followed by a DNA Metabarcoding and sequencing analysis of the 18S rRNA gene. Phylogenetic analysis will identify vertebrate species present in each habitat. Understanding these microhabitats offers insights into ecological and behavioral adaptations.

GAEL SANON

Adaptation of Patient-Derived Brain Cancer in a 96-Well faCellitate Plate Using the CellTiter-Glo® 3D Assay

Melanoma brain metastases pose a significant treatment challenge due to the lack of effective drugs. Research has been hindered by irrelevant disease models. To address this, we developed 3D patient-derived melanoma spheroids, which better replicate tumor microenvironments for drug screening. Partnering with microplate manufacturers, we evaluated these spheroids in a 96-well faCellitate plate using the CellTiter-Glo 3D assay. Spheroids were cultured at varying densities, monitored microscopically over the scope of our days, and assessed for viability via luminescence readings using a PheraStar reader. Confocal microscopy confirmed spheroid formation, and luminescence readings correlated with cell density within the linear detection range. The assay demonstrated robustness, maintaining a consistent Z' factor across densities. Our findings confirm that the faCellitate plate supports melanoma brain metastasis spheroid culture and viability assessment, providing a physiologically relevant model for high-throughput drug screening and aiding the search for more effective treatments.

MELANIE SAROZA-PLACENCIA

Short-Term Memory and Learning Inhibition in Fragile X Syndrome Drosophila Larvae

Fragile X Syndrome (FXS) is an X-linked neurodevelopmental disorder responsible for learning and memory deficiencies by silencing the production of Fragile Messenger Ribonucleoprotein (FMRP) [Hunter et al., 2014]. FXS begins in childhood and progresses into adulthood, making studies on adolescent behavior equally as important as adult behavior. Adult FXS Drosophila melanogaster has been shown to have impaired learning and memory [Trajkovic et al., 2023], but FXS larvae have yet to be studied for learning and memory deficits. FXS (dFmr1Î"50M) flies were compared to wild type (w1118) controls and dunce (dnc;;tm2/tm6) positive controls through an appetitive associative olfactory learning protocol [Apostolopoulou et al., 2013] to investigate FXS memory deficits in early development. Preliminary trends show that FXS fly behavior bears more similarities to dunce flies than wild types. We aim to connect the findings of larval behavioral assays with the growing body of research on learning and memory deficits in FXS.

KIMBERLY SCHWELGER

Developing a Microcontroller-Based Data Acquisition System to Measure pH

For decades, scientists have been making their own laboratory equipment to conduct experiments, and as equipment has improved, the information that can be obtained from such equipment has also increased significantly, but the cost of such equipment has also increased. Data acquisition (DAQ) systems are commonly used equipment in labs, and they consist of sensors, measurement devices, and computers. A sensor will measure physical values and convert them to electrical signals, which can undergo modifications such as amplification, conditioning, linearization, and more before being sent to a computer for further modifications and display. This project aims to develop a DAQ system to measure pH using a combination electrode, Raspberry Pi Pico microcontroller, a printed circuit board (PCB), and a computer. After assembly and programming the pH meter, its capabilities were tested by titrating sodium carbonate with hydrochloric acid to obtain a titration curve and validate the DAQ's capabilities.

NICHOLAS SHAFFER

Therapeutic Targeting of mGlyR for MDD

Major depressive disorder (MDD) is a condition that impacts an estimated 280 million people worldwide. While treatment options have become more available, the efficacy of current medication is limited, prompting the search for new strategies for the management of MDD. One newly discovered target is the metabotropic receptor for glycine mGlyR, previously known as GPR158. Importantly, mGlyR expression is upregulated in individuals with MDD, and its knockout in mice results in an antidepressant phenotype and resilience to stress. In this study, we explored the therapeutic relevance of targeting mGlyR by testing the antidepressant activity of a high-affinity mGlyR-directed compound X. Using a mouse model of stress-induced depression, we show that non-invasive intranasal delivery of compound X produces rapid and lasting anti-depressant effects, matching those of ketamine delivered the same way. Targeting mGlyR may offer a new direction for therapeutic interventions for MDD.

ABIGAIL SHEPARD

Exploring Amplitude-Induced Variability in the Tree Shrew Visual Cortex: A Computational Approach

The visual cortex constitutes an integral part of the brain responsible for processing external visual stimulation. Neurons in this area have preferred responses to orientation, a phenomenon known as orientation selectivity. While gathering firing responses from the tree shrew cerebral cortex, collaborators from the Max Planck Florida Institute at the Fitzpatrick Lab observed a new avenue of response variability linked to the amplitude of the stimulation. We hypothesize that the network architecture coupled with selective activation of the specific neurons can explain this phenomenon. As a proof of concept, we aimed to develop a biophysical computational model to replicate the amplitude-induced response. Our findings show that specific populations targeted by stimulus activation replicate observed response patterns. We have also linked the patterns to specific simulated connections utilizing artificial neural networks, and we expect that this framework will allow seamless identification of network architecture.

MACKENZIE STOWELL

Repeat Consumption of Media: How Does It Affect Our Stress?

Over the past decades, anxiety in the college student population has appeared to increase and it is important to understand how best to help students cope with their anxiety in healthy ways. This current study examines the extent of, and motivations underlying, repeat consumption of television shows and movies among college students. Participants also reported their stress level over the past month prior to taking the survey. Data collection is ongoing. A preliminary analysis shows that college students who scored higher on the Perceived Stress Scale also reported rewatching their favorite television shows and movies less often than those who reported rewatching more often. Final results and implications of repeat consumption of media as a possible coping mechanism will be discussed and presented on.

JAKE THORNBERRY

Investigation of interleukin-1 beta expression in the brain under chronic inflammatory pain using ß-TRAP mice

This study examines IL-1ß, a pro-inflammatory cytokine involved in inflammatory pain modulation via the IL-1R1 system, using Î-TRAP mice to visualize IL-1ß-expressing cells. Mice received Complete Freund's Adjuvant (CFA) in the hind paw to induce inflammatory pain through a sustained immune response. 4-hydroxy tamoxifen (4-OHT) was administered at a specific time post-CFA to activate a tdTomato reporter gene labeling IL-1ß-expressing cells. Immunohistochemistry and confocal imaging were used to identify IL-1ß-expressing cells in brain regions critical for pain regulation. Our preliminary findings show a significant increase in IL-1ß expression in the periaqueductal gray (PAG) at 1-3 days post-CFA injection. Interestingly, many IL-1ß-expressing cells also co-express NeuN, a neuronal marker, indicating IL-1ß expression in PAG neurons under inflammatory pain conditions. To further elucidate IL-1ß's functional role in inflammatory pain, we are currently investigating its expression patterns in additional brain regions critically involved in pain processing, modulation, and the overall neuroinflammatory response mechanism.

KAIYA TOMASIK

Investigating the Genetic Susceptibility of Cancer in Gopher Tortoises

Cancer in tortoises seems to be relatively rare based on previous studies. I am studying gopher tortoises to gain a better understanding of their biology in relation to cancer probabilities. Both the Chelonoidis niger and Gopherus Flavomarginatus (closely related species to the gopher tortoise) have been found with multiple duplicated copies of tumor suppressor genes, contributing to their rare probabilities of developing cancer. Specifically, the Wilms' Tumor Suppressor gene (WT1) has not yet been sequenced. It plays a role in temperature dependent sex determination and kidney formation, with its cistronic mutations causing metastasis and cancer. Primers were developed to amplify a sequence found on exon 8, a portion of the gene that is alternatively spliced. I then performed Sanger sequencing and compared the sequence to other Gopher Tortoises. Learning the sequence of the WT1 gene will be the first step in understanding genetic influences on gopher tortoise susceptibility to cancer.

AVA TRACY

Polystyrene Microplastics Impact on Drosophila melanogaster Development and Lifespan From Embryo-Adulthood

Classified as endocrine disruptors and suspected to have a myriad of other impacts on human health, MPs impacts on development remain understudied. This study aims to explore the impacts of MPs on fertility, development and lifespan in Drosophila melanogaster. Administered via food, MPs once ingested move through the organism leading to physiological changes. Concentrations from 0.1%-10% are used to identify where impacts begin, expected at 1%. Test organisms are split into a single dose or prolonged exposure group. In the prolonged exposure group, the impact is measured through tracking of mortality rates from the pupal stage to adulthood. Assays including a larval crawling assay will be completed to determine the developmental and locomotor effects in early life following generational exposure. In the single dose group fluorescence will be used to visualize the locations of deposition. Preliminary results suggest that exposure results in fewer pupae and lowered reproductive activity.

VYANA TRIEU

Investigation of Glucose-Regulated Protein 78 as a Potential Target for Lung Cancer

Glucose-regulated protein 78 (GRP78), a member of the HSP70 family, is essential for maintaining ER proteostasis. In lung cancer, GRP78 overexpression provides a survival advantage by supporting rapid protein production, stabilizing mutated proteins, and mitigating ER stress. Elevated GRP78 levels in cancer tissues correlate with worse clinical outcomes, highlighting it as a potential drug target. Achieving isoform-selective inhibition of HSP70s is challenging due to 13 isoforms in humans. This research seeks to develop inhibitors targeting GRP78's substrate-binding domain (SBD). We optimized heterologous expression of GRP78 and its SBD using Rosetta 2 and CodonPlus strains and four plasmids to maximize yield. Preliminary results revealed high expression levels of GRP78 and SBD using Rosetta 2 and pET28 plasmid. Fluorescence polarization assays were developed to assess GRP78 function and inhibitor binding. These findings lay the groundwork for the discovery and development of highly specific GRP78-targeted therapies, providing potential treatment options for lung cancer.

ARJUN VADLAMUDI

Developing a Computational Model for the Giant Fiber System of Drosophila

The Giant Fiber System (GFS) in Drosophila melanogaster enables their rapid escape response from predators. However, escape response times have been seen to decrease due to age because of a decrease in the neural circuit's signal transmission speed. Previous computational models have looked at specific GFS signaling. This research studies the effects of altering certain signaling properties in a custom GFS computational model. After cleaning the model's script, we will test potassium conductance (gK), sodium conductance (gNa), synaptic conductance (gSyn), and gap junction conductance (gGap) respectively. We then tested the neuron's physical properties: axon and terminal length, diameter and volume. Lastly, we analyzed how increasing the quantity of giant fiber-connected neurons will affect synaptic outcomes. By observing the tests' data, we expect to see how each variable correlates with firing probability, stimulus intensity, and membrane potential. These findings can provide significant insights on this species' survival behavior.

SOFIA WASILEWSKI

More Than Just Labels: Crafting Comfort and Authenticity in Intersecting Otherness

Using visual media with a combination of experimental, representative, and abstract stylization, through artistic methods and scientific research, I will explore gender identity, the neurodiverse nature of human experiences, and social stigmas surrounding the topic of sexuality.

KAYLA WIN

Microbiological Monitoring of ATP in a Veterinary Setting by Utilizing ATP Bioluminescence

As microbial infection is often difficult to detect but impactful to experimental results, this project concerns the microbiological monitoring of mouse colonies using a method based on ATP-detection. ATP bioluminescence is an objective testing system for the evaluation of sanitization and microbial monitoring. This technique utilizes a luciferase, an enzyme class that catalyzes luciferin oxidation and produces a visible light. The aim of this study is to determine the efficacy of ATP detection for measuring microbial infection, which is necessary to ensure that contaminants do not disrupt test subjects and that research results are accurate. The vivarium at Florida Atlantic University utilizes multiple methods of sanitization and ATP detection. Luminometers such as the NeoGen AccuPoint are specific ATP detectors. In this study, we sampled various sites in the Neurobehavioral Core and with or without different sanitization treatments. All data was statistically analyzed with RStudio. ANOVA, followed by post-hoc comparison tests, were used to identify statistically significant differences across the groups. This study reveals the efficacy of sanitization methods used at FAU.

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Harriet L. Wilkes Honors College
Florida Atlantic University
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561.799.8620

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