



FLORIDA ATLANTIC UNIVERSITY

Harriet L. Wilkes
Honors College

24th
ANNUAL

SCHOLARLY
& CREATIVE
research
SYMPOSIUM

Friday, April 10

John D. MacArthur Campus

Chastain Lecture 2026

The Language of the Ocean
and Why We Should be Listening



SPEAKER

PAUL R. JENSEN, Ph.D.

Professor Emeritus
Scripps Institution of Oceanography
University of California San Diego

24TH ANNUAL



SYMPOSIUM COMMITTEE:

Zachary Ferrara – chair

Dorotha Lemeh

Tracy Mincer

Conrad Toepfer

Calyssa Setterberg (ex officio)



MESSAGE FROM DEAN JUSTIN PERRY, PH.D.

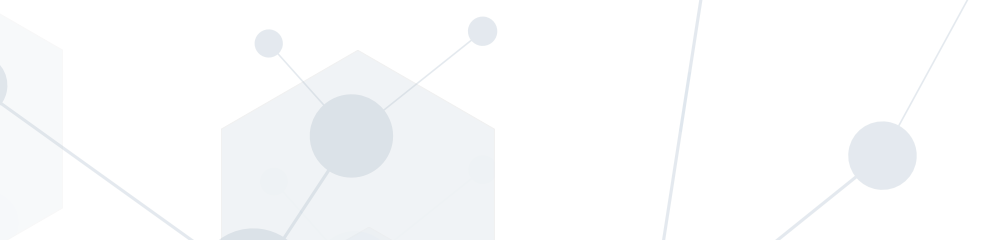


Welcome to the 24th Annual Harriet L. Wilkes Honors College Scholarly and Creative Research Symposium, in which we celebrate the high-caliber, original scholarship and creativity of our students. Today we have the opportunity to watch the students we have taught, advised, and mentored share their academic 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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PROGRAM AND EVENT SCHEDULE

The 2026 Robert Lee and Thomas M. Chastain
Honors Symposium Lecture Presents:

PAUL R. JENSEN, PH.D.

Professor Emeritus, Scripps Institution of
Oceanography, University of California San Diego



Chastain Lecture 2026

The Language of the Ocean and Why We Should Be Listening

EVENT SCHEDULE: APRIL 10, 2026

8:30-9:00 AM	Participant Registration	AD Building
9:00-10:15 AM	Session 1: Oral Presentations	AD Building
10:15-10:30 AM	Break	
10:30 AM-Noon	Session 2: Oral Presentations	AD Building
Noon-1:00 PM	Break	
1:00-2:00 PM	Chastain Lecture: Paul R. Jensen, 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

	AD 103	AD 104	AD 202	AD 204	AD 205	AD 206
Moderator	Tim Steigenga	Conrad Toepfer	Kelsie Bernot	Chris Ely	Rachel Luria	Shaina Rowell
9:00 AM	Danylo Fedkiv	Jason Pindell	Kasey Steele	Anna Murphy	Ria Parmar	Samantha Reyes
9:15 AM	Ryan Fernandez	Hannah Epstein	Dionisia Touzin	Gryffyn Okoee	Kasmira Dean	Autumn Abbas
9:30 AM	Vivien Levine & Ashlyn Hendricks	Nicholas Tozzo	Olivia Burns	Shannon Bieniek	Lamine Morris	Anna Briscoe
9:45 AM	Alexis Jilani & Brianna Letterio	Ashley Arbesfeld	Steven Amorosino	Ella Karakadze	Emma Flynn	Roshni Kannan
10:00 AM	Mallory Schumaker	Lizbeth Moncada	Jolie Guo	Caroline Ribeiro	Samantha Reyes	Sheila Rios

SESSION 2

	AD 103	AD 104	AD 202	AD 204	AD 205	AD 206
Moderator	Tim Steigenga	Nancy Tille-Victoria	Miguel Vazquez	Warren McGovern	Mark Tunick	Shaina Rowell
10:30 AM	Delaney Rosenblatt	Justin Macaluso	James Ireland	Danylo Fedkiv	Karen Walker	Jenna Duke
10:45 AM	Mai'Shuyn Jeffers	Ian McMillan	Jordan Pomerantz	Vincent Stafford	Jadyn Cooper	Spencer Brown
11:00 AM	Gabriella Floyd	Mya Rousseau	Christina McCabe	Zahava Misshula	Kayla Baptiste	Vanessa Jimenez
11:15 AM	Ethan Stark	Andrew McMillan	Shelby Wingo	Daniela Metianu	India Fennell	Natalia Builes
11:30 AM	Cali Crossman	Evan Heck	Keisha Bansal	Shyla Grant	Varshitha Bojanapati	Santiago Gollarza
11:45 AM	Rebekah Jackson	Mallory Neal	Serena Amro Gazze	Kacian Clayton	Amber Wolf	Jindry Hernandez

ORAL PRESENTATIONS

9:00 AM

AD103 **DANYLO FEDKIV**

Advisor/Professor: Christopher Strain, Ph.D., Timothy Steigenga, Ph.D.
Bottles For Bits: Turning Bottles into 3D Printed Opportunities

AD104 **JASON PINDELL**

LUCAS DEESE, ZACKERY WISTORT, PH.D., HANNA BRIDGHAM, JORDON BECKLER, PH.D.

Advisor/Professor: Jordon Beckler, Ph.D., Zackery Wistort, Ph.D.,
Hanna Bridgham
The Remote Sensing Detection of Sediment-Derived DOC to CDOM in
Surface Waters

AD202 **KASEY STEELE**

KELSIE BERNOT, PH.D.

Advisor/Professor: Kelsie Bernot, Ph.D.
Balancing Innovation and Regulation: Legal Implications of Stem Cell
Research

AD204 **ANNA MURPHY**

Advisor/Professor: Christopher Ely, Ph.D., Timothy Steigenga, Ph.D.
Contemporary Famines as Strategy, not Tragedy: A Case Study of
Weaponized Starvation in Gaza

AD205 **RIA PARMAR**

Advisor/Professor: Daniel De Lill, Ph.D.
How is Chemistry Being Used by Science Fiction Writers

AD206 **SAMANTHA REYES**

Advisor/Professor: Shaina Rowell, Ph.D.
Influences of Neuroticism, Extraversion, and Agreeableness on Memory
Rehearsal and Fading Affect Bias

9:15 AM

AD103 **RYAN FERNANDEZ**

Advisor/Professor: Timothy Steigenga, Ph.D., Christopher Strain, Ph.D.
PantryPro: Using Technology to Tackle Food Insecurity

AD104 **HANNAH EPSTEIN**

JAMIE KNAUB, TRICIA MEREDITH, PH.D. AND MARIANNE PORTER, PH.D.

Advisor/Professor: Conrad Toepfer, Ph.D.
Scanning Scaley Shark Skin: Quantifying 3D Variation in Denticle Morphology of Bonnethead Sharks

AD202 **DIONISIA TOUZIN**

SOPHIA FERRIZZI

Advisor/Professor: Kelsie Bernot, Ph.D., Jason Yuan, Ph.D.
Doxorubicin as a Potential Treatment for Pulmonary Vascular Disease

AD204 **GRYFFYN OKOEE**

Advisor/Professor: Christopher Ely, Ph.D.
Riders of the Perfect Storm: The Rise of the Warlord in Post-Soviet Afghanistan

AD205 **KASMIRA DEAN**

Advisor/Professor: Wairimū Ngaruiya Njambi, Ph.D.
Institutionalizing Paternalism: The Subordination of Midwifery & American Maternal Mortality

AD206 **AUTUMN ABBAS**

Advisor/Professor: Laura Vernon, Ph.D., Wairimū Ngaruiya Njambi, Ph.D.
Menstruation, Mood, and Borderline Personality Disorder: Premenstrual Exacerbation, Treatment Challenges and Proposed Solutions

9:30 AM

AD103 **VIVEN LEVINE & ASHLYN HENDRICKS**

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

Joyworks

AD104 **NICHOLAS TOZZO**

Advisor/Professor: Terje Hill, Ph.D., David Myers, Ph.D.

Meaningful Learning in the General Chemistry Laboratory

AD202 **OLIVIA BURNS**

CHRISTOPHER L. HAGA, PH.D., CRYSTAL N. LE, XUE D. YANG, DONALD G. PHINNEY, PH.D.

Advisor/Professor: Tricia Meredith, Ph.D., Donald Phinney, Ph.D.

Computational Design of Selective ACVR2B Peptide Inhibitors to Promote Lean Muscle Mass and Reduce Adiposity

AD204 **SHANNON BIENIEK**

MEGAN RUSSELL, NOAH GORMAN, ANDIA CHAVES-FONNEGRA, PH.D.

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

Microhabitat Occupation Patterns of Cryptobenthic Reef Fish and Brittle Stars on the Sponge *Callyspongia aculeata*

AD205 **LAMINE MORRIS**

Advisor/Professor: Wairimū Ngaruiya Njambi, Ph.D., Mark Tunick, Ph.D.

The Politics of Potty Policing: The Issues with Criminalizing Public Restroom Use Based on Sex at Birth

AD206 **ANNA BRISCOE**

Advisor/Professor: Zachary Ferrara, Ph.D.

An Economic Analysis of Sustainability Efforts in the Personal Care and Cosmetics Industry

9:45 AM

AD103 **ALEXIS JILANI & BRIANNA LETTERIO****Advisor/Professor:** Christopher Strain, Ph.D.

PawCycle

AD104 **ASHLEY ARBESFELD****JEROME NWACHUKWU, KENDALL NETTLES, PH.D****Advisor/Professor:** Catherine Trivigno, Ph.D., Jerome Nwachukwu, Kendall Nettles, Ph.D

Revisiting: Molecular Features of EGFR-driven Endocrine Resistance in Breast Cancer

AD202 **STEVEN AMOROSINO****JI-HEON HAN, BINBIN WU, PH.D., WILLIAM JA, PH.D.****Advisor/Professor:** Tricia Meredith, Ph.D., William Ja, Ph.D.Influence of Dietary Sugar on Feeding Behavior of Cropectomized *Drosophila*AD204 **ELLA KARAKADZE****NICOLE YOUNG, MEGAN RUSSELL, ANDIA CHAVES-FONNEGRA, PH.D.****Advisor/Professor:** Andia Chaves-Fonnegra, Ph.D.

Infauna Diversity in Sponges with Different Microbial Abundances and Microhabitat Interactions

AD205 **EMMA FLYNN****Advisor/Professor:** Micheal Harrawood, Ph.D., Wairimū Ngaruiya Njambi, Ph.D.

Beyond the Other: Feminist Subjectivity and the Remnants of Patriarchy in Jacqueline Harpman's "I Who Have Never Known Men"

AD206 **ROSHNI KANNAN****QI ZHANG, PH.D.****Advisor/Professor:** Qi Zhang, Ph.D.

Constructing An In vitro Human-Cell Model to Study ApoE4 in Alzheimer's Disease

10:00 AM

AD103 **MALLORY SCHUMAKER**

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

AD104 **LIZBETH MONCADA**

Advisor/Professor: Catherine Trivigno, Ph.D., Kendall Nettles, Ph.D.
Structural Analysis of Solvent Channel-Mediated Selectivity in Steroid Receptors

AD202 **JOLIE GUO**

JAMIE KNAUB, CANDIDO DIAZ, PH.D.

Advisor/Professor: Tricia Meredith, Ph.D., Candido Diaz, Ph.D.
Utilizing Micro-Computed Scanning to Delineate Reproductive Morphology in *Paraplectana*

AD204 **CAROLINE RIBEIRO**

Advisor/Professor: Christopher Ely, Ph.D.

"Law, Memory, and Justice" - Lessons from Spain and Germany's democratic transitions

AD205 **SAMANTHA REYES**

Advisor/Professor: Wairimū Ngaruiya Njambi, Ph.D.

Generational Trauma: Tracing the Line from Colonization to Contemporary Trauma

AD206 **SHEILA RIOS**

Advisor/Professor: Shaina Rowell, Ph.D.

Is Rehearsal a Mediator Between Personality and Fading Affect Bias?

ORAL PRESENTATIONS

10:30 AM

AD103 **DELANEY ROSENBLATT****Advisor/Professor:** Timothy Steigenga, Ph.D.

Christians for Contras: The Reagan Administration's Mobilization of Evangelicals into Foreign Policy

AD104 **JUSTIN MACALUSO****Advisor/Professor:** Christopher Strain, Ph.D.

Virtual Narrative: Video Games as an Emerging Storytelling Medium

AD202 **JAMES IRELAND****Advisor/Professor:** Sondra Washington, Ph.D., Miguel Vazquez, Ph.D.

Zora Neale Hurston and Deconstructing the Negative Stereotypes of African American Women

AD204 **DANYLO FEDKIV****CHANDANI SINGH, DEEPAK JADHAV, PH.D., GREGG B. FIELDS, PH.D.****Advisor/Professor:** Gregg B. Fields, Ph.D., Chandani Singh

Discovery, Synthesis, and Evaluation of Selective Inhibition of MT1-MMP through Novel Small Molecule Inhibitors

AD205 **KAREN WALKER****Advisor/Professor:** Mark Tunick, Ph.D.

The Eroding Sixth Amendment: Florida's Rewriting of the Speedy Trial Rule

AD206 **JENNA DUKE****Advisor/Professor:** Kevin Lanning, Ph.D.

Giftedness and Psychopathology: A Review

10:45 AM

AD103 **MAI'SHUYN JEFFERS**

Advisor/Professor: Timothy Steigenga, Ph.D.

The Role of US Immigration Policy in Traumatizing Guatemalan Transnational Families and How it Affects their Socioeconomic Prosperity in America

AD104 **IAN MCMILLAN**

Advisor/Professor: Christopher Strain, Ph.D., Zachary Ferrara, Ph.D.

Repackaging Reform

AD202 **JORDON POMERANTZ**

KATIE J. FOWLER, PH.D., JUSTIN PERRAULT, PH.D.

Advisor/Professor: Justin Perrault, Ph.D. and Katie J. Fowler, Ph.D.

Evaluation of Stranded Loggerhead Sea Turtle (*Caretta caretta*) Sex Ratios Relative to Population Baseline

AD204 **VINCENT STAFFORD**

Advisor/Professor: Jason Hedetniemi, Ph.D.

Algorithms for Domination in Graphs

AD205 **JADYN COOPER**

Advisor/Professor: Mark Tunick, Ph.D.

Corporate Personhood and the Scope of Constitutional Rights

AD206 **SPENCER BROWN**

Advisor/Professor: Kevin Lanning, Ph.D.

Influence of ASD on Morality

11:00 AM

AD103 **GABRIELLA FLOYD**

Advisor/Professor: Keith Jakee, Ph.D., Ben Keoseyan, Ph.D.

Common Issues: A Coasian Analysis of Camping Bans

AD104 **MYA ROUSSEAU**

Advisor/Professor: Christopher Strain, Ph.D.

Exploring Morality in Nathaniel Hawthorne's Works

AD202 **CHRISTINA MCCABE**

Advisor/Professor: Annina Ruest, MFA

Exploring Public Art in Palm Beach County

AD204 **ZAHAVA MISSHULA**

Advisor/Professor: Warren McGovern, Ph.D.

Stochastic Calculus

AD205 **KAYLA BAPTISTE**

Advisor/Professor: Mark Tunick, Ph.D., Kevin Lanning, Ph.D.

Juvenile Justice

AD206 **VANESSA JIMENEZ**

Advisor/Professor: Kevin Lanning, Ph.D.

Gender Dysphoric Youth: Social, Behavioral, and Medical Concerns

11:15 AM

AD103 **ETHAN STARK**

KEITH JAKEE, PH.D.

Advisor/Professor: Keith Jakee, Ph.D., Zachary Ferrara, Ph.D.

A Critique of Using SSB Ban Modeling to Predict Health Equity Improvements

AD104 **ANDREW MCMILLAN**

Advisor/Professor: Christopher Strain, Ph.D.

PATRIOT's Dilemma: How the USA PATRIOT Act Normalized Surveillance

AD202 **SHELBY WINGO**

Advisor/Professor: Jacqueline Fewkes, Ph.D.

The Importance of Pedigree within Dog Sports: Undergraduate Senior Honors Thesis Project

AD204 **DANIELA METIANU**

Advisor/Professor: Warren McGovern, Ph.D., Casey Spencer, Ph.D.

A Comparative Study of Neurodegenerative diseases in Alzheimer's, Lewy body, and Parkinson's Disease

AD205 **INDIA FENNELL**

Advisor/Professor: Mark Tunick, Ph.D., Benjamin Keoseyan, Ph.D.

The Cultivation of Virtue in a Liberal Democracy

AD206 **NATALIA BUILES**

ANA TYULMENKOVA

Advisor/Professor: Robert W. Stackman Jr., Ph.D.

Modulating Fear Extinction Using the 5-HT_{2c} Antagonist SB-242084

11:30 AM

AD103 **CALI CROSSMAN**

Advisor/Professor: Keith Jakee, Ph.D.

Invisible Power Through Digital Identification and Digital Commerce

AD104 **EVAN HECK**

NICHOLAS MCINCHAK, MACIEJ STAWIKOWSKI, PH.D., QI ZHANG, PH.D.

Advisor/Professor: Qi Zhang, Ph.D.

Application of a Novel Class of Lipid Probes for Cell Imaging

AD202 **KEISHA BANSAL**

Advisor/Professor: Erik Duboue, Ph.D., Chitra Chandrasekhar, Ph.D.,
Bethany Stanhope, Ph.D.

Brain-wide Mapping of Adaptive Feeding States in *Astyanax mexicanus*

AD204 **SHYLA GRANT**

Advisor/Professor: Tracy Mincer, Ph.D.

Understanding Microbial Adhesion Using AI

AD205 **VARSHITHA BOJANAPATI**

NEHA SAPKAL, SALIL BIDAYE PH.D

Advisor/Professor: Salil Bidaye, Ph.D.

A Connectomics Guided Approach to Characterizing Subtypes of Bolt
Protocerebral Neurons in *Drosophila melanogaster*

AD206 **SANTIAGO GOLLARZA**

Advisor/Professor: Surya Pandey, Ph.D.

Long-Term Neurobehavioral Impact of Prenatal Oxycodone Exposure

11:45 AM

AD103 **REBEKAH JACKSON**

Advisor/Professor: Chitra Chandrasekhar, Ph.D.

Plastics and Microplastics: The Environmental Impacts and the Possibility of Microplastic Signatures as Human Geographic Markers

AD104 **MALLORY NEAL**

NICOLE YOUNG, CHRISTOPHER SPAGNOLIA, MEGAN RUSSELL, ANDIA CHAVES FONNEGRA, PH.D.

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

Infauna Communities in *Aplysina insularis* and *Niphates erecta* Sponges Using eDNA

AD202 **SERENA AMRO GAZZE**

PETER IGWILO, RENEE MAPA, JOHANNA KOWALKO, PH.D., ERIK DUBOUE, PH.D.

Advisor/Professor: Erik Duboue, Ph.D., Casey Spencer, Ph.D.

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

AD204 **KACIAN CLAYTON**

Advisor/Professor: Tracy Mincer, Ph.D., Catherine Trivigno, Ph.D., Predrag Cudic, Ph.D.

Modulating the Plastisphere: Inhibiting Biofilm Formation of *Vibrio* spp.

AD205 **AMBER WOLF**

Advisor/Professor: Julie Earles, Ph.D., Mark Tunick, Ph.D.

Did Eye Really See That?: Eyewitness Testimony and Faulty Memory Recollection Within the Legal System

AD206 **JINDRY HERNANDEZ**

Advisor/Professor: Shaina Rowell, Ph.D.

The Interplay of Bicultural Identity with the Fading Affect Bias

VISUAL ARTS AND CREATIVE RESEARCH

SR BUILDING, ROOM 149

2:00 - 4:00 P.M.

ANGELICA ESPINOSA-PENA

Advisor/Professor: Annina Ruest, MFA

At the End of This Universe

GAVIN FUERTE

Advisor/Professor: Conrad Toepfer, Ph.D., Annina Ruest, MFA

Living with Dementia: Research Paper and Video Game

LAUREN IMBERT

Advisor/Professor: Jacqueline Fewkes, Ph.D., Rachel Luria, MFA

The Perfect Match

MALIA MCGETCHIN

Advisor/Professor: Annina Ruest, MFA

Save the Hospital

KATTARYNA SALZMAN

Advisor/Professor: Annina Ruest, MFA

Digital Map Display

CAITLYN SEAL

Advisor/Professor: Annina Ruest, MFA, Dorothea Lemeh, MFA,

Nico Cassenetti, MFA

Dante's Insta-ferno



Honors Design and Color Phenomena

Advisor/Professor: Dorotha Lemeh, MFA

LONDON COHN, TAYNALECIA HALL, JAMES LEE, ELLE LINETSKY, MADISON MCADOO,
MELINA MIGOYA, CAITLYN SEAL

Audubon's Scientific Illustration

Advisor/Professor: Jon Moore, Ph.D.

YUSUF ASAD, AMI BIRETA, LAUREN BLAKE, DANIEL BOKOR, CAELYN BUTLER,
SAMANTHA CROGE, SOPHIA DE ALMEIDA FERREIRA, AKHILA GOURABATHINA,
ALEJANDRA GUEVARA PADRON, ALICE KIM, RACHEL KNOWLES, KAYLA LINDER,
ELLE LINETSKY, VICTOR LOPEZ, MALIA MCGETCHIN, MARIO MEDINA, KAYLA RILEY,
CAITLYN SEAL, ISABELLE SOLAGES, RACHEL THUM, AUSTIN WARD, KYRIA WICKHAM,
ANGELA YU

Drawing I

Advisor/Professor: Vincent Lardieri

ISABEL BLANCO, LEE-JAE GORDON, IVOREE' HENDRIX, RACHEL KNOWLES

Elements of Visual Thinking

Advisor/Professor: Vincent Lardieri

ISABEL BLANCO, BROOKE HARVEY, KASSANDRA LIBURD

RESEARCH POSTER

HC Building

2:00 - 4:00 P.M.**ENITAN ADENIGBAGBE****MCLEAN BOLTON, PH.D., CAROLYN VON-WALTER****Advisors/Professors:** Julie Earles, Ph.D., Casey Spencer, Ph.D.,
McLean Bolton, Ph.D.LTD Dynamics in NLGN1 Mutant Mice Models: A Patch-Clamp Study of
Amygdalar Circuits LTD**DANNY ANGELES****KELSIE BERNOT, PH.D.****Advisor/Professor:** Kelsie Bernot, Ph.D.

Microgravity Effects on the Immune System in Simulated Spaceflight

EMILY ARBESFELD**QUINTEN BOURNE, CHANTAE BENNETT, JOSHUA REYNOLDS****Advisor/Professor:** Catherine Trivigno, Ph.D., Tanja Godenschwege, Ph.D.
Functional characterization of *Drosophila* Attractin in Insulin and Stress
Signaling**ADOLFO ARTIGAS****IVANA LEZCANO, JEANETTE WYNEKEN, PH.D.****Advisor/Professor:** Ivana Lezcano, Jeanette Wyneken, Ph.D.,
Tracy Mincer, Ph.D.A Quantitative Analysis of Sea Turtle (*Chelonia mydas*, *Caretta caretta*,
Lepidochelys kempii) Suture Morphology**IAN AVILES****ANIA KNAPINSKA, PH.D., GREGG B. FIELDS, PH.D., BEN PANITZ****Advisor/Professor:** Catherine Trivigno, Ph.D., Ania Knapinska, Ph.D.
Identifying factors contributing to rheumatoid arthritis development by
high-throughput gene expression analysis

VIDUSH BALMURI

KEVIN KNIGHT, PATRICK GRIFFIN, PH.D.

Advisor/Professor: Patrick Griffin, Ph.D.

Confirming Wild-Type TP53 in Cancer Cell Lines to Support ROR β -Linked Antiproliferative Phenotypes

ERIN BELL

CARA MELILLO, MAUREEN K. HAHN, PH.D., RANDY D. BLAKELY, PH.D.

Advisor/Professor: Maureen K. Hahn, Ph.D., Randy D. Blakely, Ph.D.

Evaluation of Microglial Activation in Hippocampus of Mblac1 Knockout Mice

RACHEL BENBASAT

Advisor/Professor: William O'Brien, Ph.D., Wairimū Ngaruiya Njambi, Ph.D.
Ecofeminist Entanglements

VARSHITHA BOJANAPATI

Advisor/Professor: Jennifer Krill, Ph.D.

Evaluating South Asian Saponaceous Plants (*Sapindus mukorossi* and *Acacia concinna*) for Handwashing Efficacy Using Sterile Swab Sampling

KRISTA BOSE

ANDREW WHYTE JR.

Advisor/Professor: Mare Cudic, Ph.D.

O-GlcNAc Serine Building Block for Tau Peptide Assembly

CLAUDIA BUDA

Advisor/Professor: Chitra Chandrasekhar, Ph.D., Shaina Rowell, Ph.D.

Genetic Variation in SLC6A4 and Cytochrome P450 Enzymes: Implications for Personalized SSRI Treatment in Major Depressive Disorder

VALENTINA CAMPOS

Advisor/Professor: Simon Pieraut, Ph.D., Kelsie Bernot, Ph.D.

Control of the Extracellular Matrix by Complement Component C1q

ADELAIDE COHN

Advisor/Professor: Rachel Luria, MFA

How Aristotle and Lesbian Pulp Fiction Expose Personas in the LGBTQ+ Community

LONDON COHN

TESSA DALLO

Advisor/Professor: Laura Fontenas, Ph.D.

Radial Glia Morphology and its Relationship to MEP Glia in the Zebrafish Spinal Cord

MARCOS CORREA

Advisor/Professor: Terje Hill, Ph.D., James VanZwieten, Ph.D.

Wave Energy Converter Optimization

EMILY CUMMINGS

HALEY EVANS, GABRIELLA FUNDERLICH, HOLLIS HODGES, SAMY JEANNOT, EDWARD KING, ANDREW KOSCHO, RYANN MARTIN, SHANE PATEL, KAROLINA THOMAS, BRIANNA TONNER, JON MOORE, PH.D., KELSIE BERNOT, PH.D.

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

Phylogenetic Analysis of Gopher Tortoise Genes Associated with Hypoxia Resistance

LYAN DARBOYS GUERRERO

ZACHARY COMELLA, PRANAV MEKA, JOSEPH JABLONSKI, LUISA MORI, SUSANA VALENTE, PH.D., SONIA MEDIOUNI JABLONSKI, PH.D.

Advisor/Professor: Chitra Chandrasekhar, Ph.D., Susana Valente, Ph.D.

Exploring the Role of Pioneer Transcription Factors in HIV Transcriptional Regulation

NAHILA DAVIS

Advisor/Professor: Casey Spencer, Ph.D.

Glia regulate motor circuit excitability through cell subtype domain and spatial-specific manner

SAVANNAH DEUTSCH

Advisor/Professor: Jon Moore, Ph.D.

Patterns Of Predation: Examining Trends of Sea Turtle Egg Predators and Their Effects on Hatchling Success

ASHWIN DHAR

SEBASTIEN BULLICH, SARAH STERN, PH.D.

Advisor/Professor: Kelsie Bernot, Ph.D., Sarah Stern, Ph.D.

Quantifying Lateralized pERK Activation in the Insular Cortex Following Conditioned Taste Aversion

SOPHIA FERREIRA CAMILA SALDIAS-MANIEU

Advisor/Professor: Nancy Aaron Jones, Ph.D, Dr. James K. Wetterer, Ph.D.

Infant Salivary Cortisol and Internalizing Behaviors

GABRIELLA FUNDERLICH

EMILY CUMMINGS, HALEY EVANS, HOLLIS HODGES, SAMY JEANNOT, EDWARD KING, ANDREW KOSCHO, RYANN MARTIN, SHANE PATEL, KAROLINA THOMAS, BRIANNA TONNER, JON MOORE, PH.D., KELSIE BERNOT, PH.D.

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

Chromosome Number and Structure of the Gopher Tortoise

AIDEN GELETA

SIMON PIERAUT, PH.D., JORDON SOLOMON, VIVIEN LEVINE, ARSHIA PREM, VALENTINA CAMPOS

Advisor/Professor: Simon Pieraut, Ph.D.

Perineuronal Nets Influence C1q Bioavailability

AMARI GELIN

Advisor/Professor: Laura Vernon, Ph.D.

The Effects of Resiliency, Perceived Social Support, and Media Exposure on Mental Health in a Latino Population

AUSTIN GEORGE

Advisor/Professor: Claire Rice, Ph.D., Erik Duboué, Ph.D., Corinne Lasmezas, Ph.D.

Age-Dependent Neural Decline in Audition in a Mouse Model of Alzheimer's Disease

SABRINA GUARDINO

Advisor/Professor: Laura Vernon, Ph.D.

Threat Probability Overestimation Following Interpersonal Trauma

HOLLIS HODGES

EMILY CUMMINGS, HALEY EVANS, GABRIELLA FUNDERLICH, SAMY JEANNOT, EDWARD KING, ANDREW KOSCHO, RYANN MARTIN, SHANE PATEL, KAROLINA THOMAS, BRIANNA TONNER, JON MOORE, PH.D., KELSIE BERNOT, PH.D.

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

Heterozygosity in the Gopher Tortoise Genome

TERESA HUANG

HUSSAM ALSHAREEF, PH.D., CRISTAL AUGER, LUCIA CARVELLI, PH.D.

Advisor/Professor: Lucia Carvelli, Ph.D., Tricia Meredith, Ph.D.

Investigating the Role of the Nicotine Acetylcholine Receptor Subunits in an Amphetamine Induced Behavior in *Caenorhabditis elegans*

NOAH HUDGENS-MOORE

Advisor/Professor: Sarah Malanowski, Ph.D.

Impact of Glitches on the Way We View Video Games

RISHA HULLOLI

VINCENT NGUYEN

Advisor/Professor: Jamie Knaub

Segmentation of Owl Pellets from Micro CT scans for an Educational Model

ALEXENDRA ILCHENKO

REBECCA DICICCO, HIDEHIKO INAGAKI, PH.D.

Advisor/Professor: Tricia Meredith, Ph.D., Hidehiko Inagaki, Ph.D.

Comparing Registration Approaches for Whole-Brain Probe Localization and Neuronal Morphology

CHARAN JARUGULA

BINBIN WU, PH.D., WILLIAM JA, PH.D.

Advisor/Professor: Tucker Hindle, William Ja, Ph.D.

Investigation of *Drosophila* Sleep Homeostasis in Social Environment

LENS JEANNOT

MADISON MCADOO, TRACY MINCER, PH.D., JON MOORE, PH.D., KELSIE BERNOT, PH.D.

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

Gopher Tortoise Burrow Soil Sample Collection Mechanism with Visuals

SAMY JEANNOT

EMILY CUMMINGS, HALEY EVANS, GABRIELLA FUNDERLICH, HOLLIS HODGES, EDWARD KING, ANDREW KOSCHO, RYANN MARTIN, SHANE PATEL, KAROLINA THOMAS, BRIANNA TONNER, JON MOORE, PH.D., KELSIE BERNOT, PH.D.

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

MHC Class II DRB exon 2 regions of Gopher Tortoise

MIRIAM KAMEL

ISABELLE ORIGLIO, CAMILA SALDIAS-MANIEU, SIENA PETROLLE, NANCY JONES, PH.D.

Advisor/Professor: Nancy Jones, Ph.D.

Diurnal Salivary Cortisol in Toddlers 10 to 18 Months in Age

EDWARD KING

EMILY CUMMINGS, HALEY EVANS, GABRIELLA FUNDERLICH, HOLLIS HODGES, SAMY JEANNOT, ANDREW KOSCHO, RYANN MARTIN, SHANE PATEL, KAROLINA THOMAS, BRIANNA TONNER, JON MOORE, PH.D., KELSIE BERNOT, PH.D.

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

Bone Morphogenetic Protein regions in the genome of *Gopherus polyphemus*

ANDREW KOSCHO

EMILY CUMMINGS, HALEY EVANS, GABRIELLA FUNDERLICH, HOLLIS HODGES, SAMY JEANNOT, EDWARD KING, RYANN MARTIN, SHANE PATEL, KAROLINA THOMAS, BRIANNA TONNER, JON MOORE, PH.D., KELSIE BERNOT, PH.D.

Advisor/Professor: Kelsie Bernot, Ph.D., Jon Moore, Ph.D., Jeff Schering

Studying Immune System Genes in *Gopherus polyphemus*

VISAK KUMAR

KUANG-TING KUO, NADESKA MONTALVAN, PATRICK GRIFFIN, PH.D.

Advisor/Professor: Patrick Griffin, Ph.D.

Development of a High-Fidelity Cell-Based Screening Platform for Orphan Nuclear Receptors via PiggyBac Transposon System

BRIANNA LETTERIO

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

Retail Trading in the Digital Age: Social Influence, Platform Design, and Market Volatility

DYLAN LIPSET

NATHAN H. JOHNSON, PH.D. JOE G.N. GARCIA, PH.D.

Advisor/Professor: Nathan H. Johnson, Ph.D. Joe G.N. Garcia, Ph.D.

cGAS-STING Pathway Involvement in Traumatic Brain Injury Induced Inflammation

RYANN MARTIN

EMILY CUMMINGS, HALEY EVANS, GABRIELLA FUNDERLICH, HOLLIS HODGES, SAMY JEANNOT, EDWARD KING, ANDREW KOSCHO, SHANE PATEL, KAROLINA THOMAS, BRIANNA TONNER, JON MOORE, PH.D., KELSIE BERNOT, PH.D.

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

The Effects of Microbiota on Juvenile Gopher Tortoise Survival

MADISON MCADOO

LENS JEANNOT, TRACY MINCER, PH.D., JON MOORE, PH.D., KELSIE BERNOT, PH.D.

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

Gopher Tortoise Burrow Soil Sample Collection Mechanism with Visuals

EMILY MCCURDY

KELSIE BERNOT, PH.D.

Advisor/Professor: Kelsie Bernot, Ph.D., Lucia Carvelli, Ph.D.

The Neurobiology of Motivation to Engage in Physical Exercise

CAMILA MILLAN

Advisor/Professor: Kevin Lanning, Ph.D., Carmen Canete Quesada, Ph.D.

A Psychobiographical Study of Horacio Quiroga: Suicide as a Protagonist

RYLEIGH NEWMAN

Advisor/Professor: Conrad Toepfer, Ph.D., Terje Hill, Ph.D.

Uncovering a Novel Neuromuscular Disorder

SHANE PATEL

EMILY CUMMINGS, HALEY EVANS, GABRIELLA FUNDERLICH, HOLLIS HODGES, SAMY JEANNOT, EDWARD KING, ANDREW KOSCHO, RYANN MARTIN, KAROLINA THOMAS, BRIANNA TONNER, JON MOORE, PH.D., KELSIE BERNOT, PH.D.

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

Comparison Between Plant Diversity and Microbes Within the Gopher Tortoise Diet and Gut

MEGAN PINSKER

JAMES K. WETTERER, PH.D., WILLIAM E. O'BRIEN, PH.D.

Advisor/Professor: James K. Wetterer, Ph.D., William E. O'Brien, Ph.D., Jerry Harasewych, Ph.D.

Comparing Density and Distribution of the Invasive Peanut Snail (*Cerion tridentatum costellatum*) Across 3 Sites in Southeast Florida

PANTEHA SARTIPI

Advisor/Professor: Casey Spencer, Ph.D.

Glia Regulates Motor Circuit Excitability to Shape Circuit Performance

ANISH SATHISH

MCLEAN BOLTON, PH.D., ERIK DUBOUE, PH.D.

Advisor/Professor: McLean Bolton, Ph.D., Erik Duboue, Ph.D.

Dendritic Morphology in Mice with Defective Cleavage of Neuroligin-1: A Synaptic Adhesion Protein Implicated in Autism Spectrum Disorder

DANIEL SCHER

DEGO DU, PH.D., MOHAMMED SELIM

Advisor/Professor: Deگو Du, Ph.D.

MnO₂ Hollow Nanoparticles Modulate Amyloid-Beta Aggregation Pathways in Alzheimer's Disease

MALLORY SCHUMAKER

STEPHAN KAJIURA, PH.D.

Advisor/Professor: Kelsie Bernot, Ph.D., Stephan Kajiura, Ph.D.

Swimming Kinematics of Sedentary and Migratory Sharks

KEITH SCOTT**CASEY SPENCER, PH.D., BRENT LIEBLING, LEONARD LIM****Advisor/Professor:** Kelsie Bernot, Ph.D., Casey Spencer, Ph.D.

FlyAPI: A Method of Aligning Behavior to Genetics using a High-Throughput Test Chamber

MICHAEL STOUFFER**Advisor/Professor:** Shaina Rowell, Ph.D.

A Literature Review on Lev Vygotsky's Cognitive Development of Higher Mental Functions as Applied to Autism Spectrum Disorder

MAHIMA SURESH**ANDY CRIDER, NING QUAN, PH.D.****Advisor/Professor:** Tricia Meredith, Ph.D.

Cell-Type-Specific IL-1R1 Signaling and Its Contribution to Alzheimer's Disease Pathology

KAROLINA THOMAS**EMILY CUMMINGS, HALEY EVANS, GABRIELLA FUNDERLICH, HOLLIS HODGES, SAMY JEANNOT, EDWARD KING, ANDREW KOSCHO, RYANN MARTIN, SHANE PATEL, BRIANNA TONNER, JON MOORE, PH.D., KELSIE BERNOT, PH.D.****Advisor/Professor:** Kelsie Bernot, Ph.D., Jon Moore, Ph.D.

Beyond the Genes: Intronic Enhancer Proxies in *Gopherus polyphemus*

Abstracts: Oral Presentations

ALPHABETICAL BY STUDENT'S LAST NAME

AUTUMN ABBAS

Menstruation, Mood, and Borderline Personality Disorder: Premenstrual Exacerbation, Treatment Challenges and Proposed Solutions

Borderline Personality Disorder (BPD) affects up to 6.2% of women, with symptoms predominantly affecting mood and affect, interpersonal relationships, and risk of self-harming behaviors. Like many other psychiatric and physical conditions, interaction of BPD with the menstrual cycle, called premenstrual exacerbation (PME) can occur. Similarly, premenstrual dysphoric disorder (PMDD) affects up to 8% of women, and shares many of the same symptoms. This paper seeks to distinguish between the characteristics of PME of BPD and those of PMDD and explore the effects that BPD can have during the luteal phase of the menstrual cycle. Proposed methods of research to further explore this topic in a clinical setting are offered along with different options for treatment methods due to current incompatibilities between medications used to treat BPD and women's reproductive health.

STEVEN AMOROSINO

Influence of Dietary Sugar on Feeding Behavior of Cropectomized *Drosophila*

Abnormal eating behaviors contribute to metabolic disorders such as obesity. Understanding how feeding behavior is regulated and altered by disease, diet, and treatment is essential for elucidating disease mechanisms and developing interventions. Quantifying human eating behavior is challenging, making *Drosophila melanogaster* a valuable model due to its powerful genetic tools for dissecting neural and genetic mechanisms underlying behavior and metabolism. We have developed a surgical approach, the cropectomy, where the crop—a digestive storage organ—is removed to model aspects of gastric bypass surgery in adult flies. Preliminary results indicate cropectomized flies display altered meal patterns without changes in total daily intake. Using the Activity Recording Capillary Feeding (ARC) assay, we quantify meal structure and total food consumption to assess the combined effects of cropectomy and dietary sugar concentration on feeding behavior. This study's findings will provide new insights into the interplay between *Drosophila* digestive physiology, diet, and ingestive behavior.

SERENA AMRO GAZZE**Investigating the Neuroanatomy of Adult *Astyanax mexicanus* Using Fully Segmented, Digital 3-Dimensional Brain Atlases**

Animals must adapt to novel environments to meet new behavioral demands, but how brains are shaped by these evolutionary adaptations remains unclear. *Astyanax mexicanus* provides an effective model because its surface-dwelling and cave-dwelling morphs exhibit neuroanatomical differences despite belonging to the same species. Accordingly, fully segmented three-dimensional brain atlases were generated for adult surface fish and Pachón cavefish to enable quantitative neuroanatomical comparison. Brains were cleared, stained with nuclear dye, and imaged using light sheet microscopy. Image stacks were registered to produce brain volumes and manually segmented using established neuroanatomical landmarks. Sixteen regions were labeled in surface fish and seventeen in cavefish, followed by volumetric extraction and fold change analyses. Cavefish showed reductions in visual-processing regions and enlargement of an olfactory region, consistent with eye loss and increased non-visual sensory reliance. Many cerebellar and forebrain regions remained volumetrically conserved. These atlases provide a quantitative framework for examining evolutionary neuroanatomical remodeling.

ASHLEY ARBESFELD**Molecular Features of EGFR-driven Endocrine Resistance in Breast Cancer**

Endocrine therapies, such as tamoxifen, are used to treat over 70% of breast cancers with tumor cells that express Estrogen Receptor, alpha (ER), but only about 30% of such cases respond to endocrine therapy after metastasis. Genomic alterations that drive endocrine resistance include amplification of the Epidermal Growth Factor Receptor (EGFR) gene, but the underlying mechanisms are not completely clear. To further understand these mechanisms, we compared the effects of EGFR overexpression on activation of kinase cascades that promote cell survival, and the transcriptional and growth-inhibitory effects of tamoxifen in ER-positive breast cancer models, *in vitro*. We also evaluated the effects of EGFR overexpression on the localization, distribution, and post-translational modification of tamoxifen-bound ER in these cells using super-resolution microscopy and high-content imaging analysis. Our findings will define important molecular features and provide invaluable insights into the mechanisms underlying EGFR-driven endocrine resistance.

KAYLA BAPTISTE

Juvenile Justice

When a minor fatally shoots their classmate, the justice system faces a harrowing question: does this child deserve the same death sentence as an adult murderer? While most instinctively answer 'no,' the philosophical 'why' remains complex. Juvenile courts were founded on the principle that young offenders are developmentally distinct, possessing limited decision-making capacity and a unique potential for reform. Some argue that punishing juveniles identically to adults harmfully ignores these developmental limits, while others contend that exempting them from adult sanctions disregards the cruelty and intent present in their crimes. Ultimately, however, no philosophical justification for punishment—neither utilitarian nor retributive—justifies treating children as adults. Because youth lack the stable character and moral agency presupposed by the law, subjecting them to adult sanctions is both inefficient and unjust. Juvenile justice must instead prioritize proportional accountability and rehabilitation, recognizing the transitory nature of youth and their capacity for meaningful change.

KEISHA BANSAL

Brain-wide Mapping of Adaptive Feeding States in *Astyanax mexicanus*

Feeding behavior is fundamental to life and is conserved across evolutionary time. Feeding states are modulated by peripheral metabolic signals interacting with central neural circuits in the brain to maintain energy homeostasis. Although feeding behaviors vary across ecological contexts, how evolution modifies these neural pathways for adaptation remains poorly understood. This project leverages the Mexican cavefish (*Astyanax mexicanus*) to investigate how feeding circuits are shaped. Cave-dwelling populations, adapted to nutrient-poor environments, exhibit pronounced hyperphagia relative to surface fish. Notably, some populations show elevated feeding into adulthood, whereas others exhibit larval-specific hyperphagia. We employed recently developed whole-brain neural activity mapping to examine how circuit-level changes underlie feeding adaptations. Our findings highlight the power of *A. mexicanus* as a model for studying the evolution of feeding behavior, revealing population-specific differences in feeding states. Moreover, our brain-wide datasets provide a foundation for future studies determining how neural activity drives evolved feeding strategies.

SHANNON BIENIEK**Microhabitat Occupation Patterns of Cryptobenthic Reef Fish and Brittle Stars on the Sponge *Callyspongia aculeata***

As hard corals decline, sponges have become increasingly relied upon as structural habitat for cryptic reef organisms. The aim of this project was to examine the abundance and distribution of the brittle star *Ophiothrix suensonii* and three cryptobenthic fish genera, and assess interspecies interactions on the sponge *Callyspongia aculeata*. The total number of brittle stars and fishes were counted on tubes of *C. aculeata* via SCUBA. Results showed that fish presence was associated with fewer brittle stars within sponge tubes. However, the distribution of brittle stars is not affected by their own density. Gobies were found in relatively higher abundance in the presence of cardinal fish. These findings support territorial or predatory behavior of fishes towards brittle stars and potential association of fish to cohabitate sponge tubes of *C. aculeata*, emphasizing sponges' essential role in supporting cryptic fauna and biodiversity on declining coral reefs.

VARSHITHA BOJANAPATI**A Connectomics Guided Approach to Characterizing Subtypes of Bolt Protocerebral Neurons in *Drosophila melanogaster***

Animals have the ability to quickly change their walking and movement patterns in response to dynamic environmental stimuli. The Bolt Protocerebral Neuron (BPN) drives straight, high velocity walking. However, not all BPN cells are active during bouts of fast walking, indicating the presence of BPN subtypes. This study aims to generate new split-GAL4 lines for each subtype using a genetic screen and characterize behavior using optogenetic activation and silencing in free walking (FlyBowl) assays to understand the heterogeneity of the BPN population. Electron microscopy generated connectome data was used to predict behavioral outcomes and interconnectivity. Morphological analysis and differences in connectivity suggest four distinct subtypes, causing either walking or flight. 'Type 1', for example, was found to cause both increases in translational velocity and walking initiation in grooming flies. Characterization of the BPN population will enable insight into how the brain seamlessly transitions between different behavioral states.

ANNA BRISCOE

An Economic Analysis of Sustainability Efforts in the Personal Care and Cosmetics Industry

Sustainability has become a topic of interest in the personal care and cosmetic industry due to current climate crises and increased consumer awareness. While many definitions of sustainability exist, this project focuses on sustainability from economic, environmental, and societal perspectives. In recent years, interest in understanding how sustainability efforts impact consumers' willingness to pay and firms' long-term success has grown. This research examines current sustainability efforts from top firms in the industry, changes in consumer behavior, and the potential economic benefits and drawbacks of these efforts.

SPENCER BROWN

Influence of ASD on Morality

Autism is a disorder that can cause an individual to struggle with social life. Social life is psychologically complex. Comprising such ideas as social skills, social interest, social maturity, and social anxiety. Deficits or differences in the social life of people with Autism Spectrum Disorder (ASD) may appear in some or all of these domains. Of particular interest is the nature of empathy in persons with and without ASD. These differences in empathy can provide insight into the moral lives of those on the Autism spectrum.

NATALIA BUILES**Modulating Fear Extinction Using the 5-HT_{2C} Antagonist SB-242084**

Traumatic experiences can lead to persistent fear responses, leading to anxiety disorders such as post-traumatic stress disorder (PTSD). Repeated exposure to fear-associated cues without threat can reduce fear responses through fear extinction. Serotonin (5-HT) modulates neural circuits in emotional learning, and prior work has shown that 5-HT acting at the 5-HT_{2A} receptor facilitates fear extinction. The 5-HT_{2C} receptor (5-HT_{2C}R) has been implicated in anxiety-related behaviors, but its role in fear extinction remains unclear. Adult male C57BL/6J mice underwent delay fear conditioning followed by three daily extinction trials 24 hours apart. Mice received the selective 5-HT_{2C} antagonist SB-242084 (0.25mg/kg or 0.5mg/kg, i.p) or vehicle 60 mins prior on extinction days 1 & 2 to examine whether pharmacological inhibition of 5-HT_{2C}R alters fear extinction. SB-242084 did not significantly affect freezing, extinction, or the number of trials to extinction, suggesting that 5-HT_{2C}R inhibition does not influence conditioned fear extinction.

OLIVIA BURNS**Computational Design of Selective ACVR2B Peptide Inhibitors to Promote Lean Muscle Mass and Reduce Adiposity**

While Glucagon-like peptide-1 (GLP-1) receptor agonists have transformed obesity treatment, they are associated with significant lean muscle loss, often accounting for 40% of total weight reduction. To address this clinical outcome, this study targeted the Activin Receptor Type 2B (ACVR2B), a master regulator of body composition whereby signaling via myostatin suppresses muscle growth, and signaling via Activin A promotes adiposity. The sequence design employed a structure-guided, de novo computational pipeline utilizing RFdiffusion for backbone generation and ProteinMPNN. Following molecular docking and kinetic analyses, six lead peptides designed to selectively ablate the ACVR2B-Activin interaction were identified. The top candidate peptide demonstrated a dissociation constant (KD) of 500 pM, representing a 600-fold increase in affinity over the native Activin ligand (KD = 300 nM). These high-affinity peptides offer a promising therapeutic strategy to preserve essential lean mass and enhance overall metabolic health potentially serving as a replacement for GLP-1-mediated weight loss interventions.

KACIAN CLAYTON

Modulating the Plastisphere: Inhibiting Biofilm Formation of *Vibrio* spp.

According to the United Nations Environment Programme (UNEP), approximately 19-23 million tons of plastic are released into the aquatic environment each year. *Vibrio* spp. are diverse gram-negative bacteria that inhabit these environments, capable of colonizing and forming biofilms on these plastic surfaces. In an age where anthropogenic activity exerts an undeniable influence on the ecosystem, elucidating a way to regulate the interactions between plastic and vibrios is essential. In previous studies, Polymyxin B has demonstrated high efficacy against biofilm formation in gram-negative bacteria, including *Vibrio cholerae*. The purpose of this study is to investigate the efficacy of cyclic lipopeptide antibiotics toward the disruption of *Vibrio* spp. biofilm formation on plastic surfaces. Polymyxin B is particularly promising and effective as vibrios are gram-negative bacteria, making them suitable candidates for this antibiotic. Novel compounds, A1A and JP2, structurally resemble Polymyxin B and are expected to share similar outcomes as form follows function.

JADYN COOPER

Corporate Personhood and the Scope of Constitutional Rights

In 2010 the Supreme Court, in *Citizens United v. FEC*, held that corporations have a First Amendment right to freedom of speech. Soon after, privately-held corporations were effectively granted the First Amendment right to exercise religion, in *Burwell v. Hobby Lobby*. Should corporations have these rights, or are rights reserved for "persons"? I argue that for-profit corporations, as artificial entities, lack the capacities for personhood and moral agency, including the capacity to express speech or exercise religion, without the use of a human agent. Since corporations are not moral agents, they don't possess rights inherently and shouldn't be granted constitutional rights to freedom of speech or religion. Instead, corporate legal rights should be limited to the rights of property and contract, which are granted due to the benefits they provide to the human agents that are involved in corporations, including employees and shareholders.

CALI CROSSMAN

Invisible Power Through Digital Identification and Digital Commerce

In recent years, new identification systems—based on advancing technology—have emerged. For example, the British government is attempting to require so-called “Digital IDs” for everyone residing there, which has caused considerable resistance. The opposition centers on the loss of privacy and security, and the fear of expanding integration of digital identification with digital commerce and digital banking and finances. In other words, there is concern over increasing governmental oversight of individuals’ finances and linking those finances to policy priorities. It raises the problem of an increasing power imbalance between individuals and the state. I will study the debate in the UK over Digital IDs and contrast it with policy developments in the United States, which has recently implemented a similar program in the “Real ID” system.

KASMIRA DEAN

Institutionalizing Paternalism: The Subordination of Midwifery & American Maternal Mortality

The United States faces a paradoxical maternal health crisis: despite leading global healthcare investment, maternal mortality rates have risen since 2018, disproportionately affecting Black women at more than double the national average. This crisis stems from medical paternalism rooted in colonial structures that systematically suppressed midwifery, beginning in the 1400s. While European countries that once persecuted midwives have successfully reintegrated midwifery models and achieved superior maternal outcomes, the United States has retained paternalistic medical frameworks that prioritize intervention over evidence-based care. Through historical analysis, theoretical examination of medical paternalism, and empirical evidence of contemporary maternal mortality, this thesis demonstrates how the colonial legacy of excluding women from birthing authority continues to harm American mothers. The work concludes by examining pathways forward, drawing on international models that challenge paternalistic approaches, and offers structural alternatives to the current American system.

JENNA DUKE

Giftedness and Psychopathology: A Review

There is a perception that gifted individuals are less psychologically well than the rest of the population. This review examines the literature on definitions and models of giftedness, and how it has been viewed from the past to the present. A range of literature is found on indicators of wellness, such as anxiety, depression, suicidality, perfectionism, and life satisfaction. Many conflicting results are found, making it difficult to determine the exact relationship between giftedness and psychopathology. Several studies today find that while gifted individuals do have their own challenges, they are, overall, not any more prone to mental health issues, and in some cases are actually more well-adjusted. However, there is some evidence that giftedness may contribute indirectly (e.g., as a moderator) to some negative outcomes. The notion that they are more vulnerable appears to be a view that was shaped by the public rather than supported by evidence.

HANNAH EPSTEIN

Scanning Scaly Shark Skin: Quantifying 3D Variation in Denticle Morphology of Bonnethead Sharks

Shark skin is covered by dermal denticles, which are tooth-shaped scales embedded in the dermis that reduce drag, increase abrasion resistance, and enhance hydrodynamic performance. Previous studies show that denticle shape and ridge spacing vary among species, along the body, and based on ecological function. Our 2D scanning electron microscopy work showed that bonnethead (*Sphyrna tiburo*) denticle ridge morphology and overlap changes as a shark matures. Here, we quantified 3D denticle variation across dorsal and ventral body regions using micro-computed tomography (micro-CT). We created 3D segmentations of denticles in SlicerMorph and measured crown aspect ratio (length:width), crown overlap, ridge height, and ridge spacing. We hypothesized that dorsal denticles would exhibit higher aspect ratios and taller ridges to maximize drag reduction, while ventral denticles would show the opposite metrics for increased protection and abrasion resistance. High-resolution 3D analyses provide new insight into intraspecific denticle variation and inform biomimetic and ecological applications.

DANYLO FEDKIV

Discovery, Synthesis, and Evaluation of Selective Inhibition of MT1-MMP through Novel Small Molecule Inhibitors

Matrix Metalloproteinases (MMPs) are endogenous zinc peptidases found in the extracellular matrix that degrade extracellular proteins, such as collagen. Membrane Type-1 MMP (MT1-MMP) is a well-studied membrane-anchored protease implicated in tissue remodeling and prognosis; its overexpression can lead to cancer and tissue damage through its enzymatic activity, requiring inhibition. This study reports the development of six novel MT1-MMP small-molecule inhibitors, their synthesis, and biological evaluation. Six inhibitors were designed and planned for synthesis by solid-phase synthesis. The resulting inhibitors were purified and analyzed for identity; of the synthesized inhibitors, fractions containing only the desired inhibitors were isolated. Biological evaluation is currently proceeding with MT1-MMP and related proteases to assess inhibitor selectivity. To date, 3 of the 6 inhibitors have been synthesized, and their evaluation is currently underway. This study establishes scaffolds for MT1-MMP inhibitors that can be modified by replacing select moieties, expanding the frontiers of future MT1-MMP small-molecule inhibitors.

DANYLO FEDKIV

Bottles For Bits: Turning Bottles into 3D Printed Opportunities

Florida faces a dual crisis: less than 8% of plastic is recycled, and Florida schools spend \$3,000 less than the national average per student, leaving over half of U.S. schools without comprehensive science and technology programs. Bottles for Bits addresses both issues by converting plastic bottles into 3D printer filament and educational tools (such as anatomical diagrams, molecular kits, and mathematical models) that were previously inaccessible to underfunded classrooms. Through a one-for-one sales model, every purchase funds a donation to teachers in need, while 3D printing hobbyists can buy sustainable filament and other commodities at below-market prices. As Palm Beach County's first bottle-to-filament recycler, we combine educational impact with environmental action: by 2026, we aim to host 4 workshops, partner with 3 schools and 1 recycling firm, collect \$5,000 in revenue, and create 100 unique products.

INDIA FENNEL

The Cultivation of Virtue in a Liberal Democracy

The stability of a liberal democracy depends not only on its institutions but on the intellectual character of its citizens. Public education shapes the dispositions and capacities students bring into civic life, and the virtues it cultivates are essential to democratic survival. Drawing on classical and modern political philosophy, I argue that public education ought to cultivate virtues such as intellectual humility, open-mindedness, empathy, and reasonableness since these traits enable citizens to deliberate, cooperate, and sustain a flourishing civic life within a pluralistic society. The U.S. public education system's emphasis on achievement, efficiency, and global competitiveness has redirected educational priorities toward economic outcomes, often at the expense of the intellectual virtues required for democratic self-governance. Philosophy is uniquely suited to address this imbalance, and integrating philosophy into public education would better align schooling with the civic virtues of a liberal democracy.

RYAN FERNANDEZ

PantryPro: Using Technology to Tackle Food Insecurity

PantryPro is a digital meal-suggestion app and food security tool that helps users turn the ingredients already in their kitchens into affordable, delicious meals. Many households struggle with meal planning and end up wasting food simply because they are unsure how to use what they have. According to the U.S. Department of Agriculture, American families waste roughly \$1,500 worth of food each year. PantryPro addresses this problem by using AI and machine-learning technology to analyze scanned or uploaded ingredients and generate personalized meal suggestions based on user preferences, dietary restrictions, and available foods. The app will operate on a free base model, generating revenue through monetization and optional premium features offered via a subscription. PantryPro is structured as a Florida-based limited liability company and is owned by founder Ryan Fernandez. Through innovative technology and partnerships, PantryPro aims to reduce food waste, save households money, and improve food access, with a full public launch planned.

ABSTRACTS

GABRIELLA FLOYD

Common Issues: A Coasian Analysis of Camping Bans

Rising homelessness has increased conflict over the rights of public property between the homeless and the rest of society. Public spaces present a problem of incompatible use as different groups claim the rights to the same property, such as public parks. In response, many cities have adopted camping bans, which gained recent attention following a ban that was upheld by the Supreme Court in 2024. This paper analyzes recent camping ban policy using Coase's normative framework for allocating property rights. The "Normative Coase" approach recognizes that the real world contains significant transaction costs and prescribes legal rules to promote efficiency. Using an economic framework for analyzing the efficiency of camping bans is important to objectively determine whether the bans are a good allocation of resources.

EMMA FLYNN

Beyond the Other: Feminist Subjectivity and the Remnants of Patriarchy in Jacqueline Harpman's *I Who Have Never Known Men*

This thesis examines how Jacqueline Harpman's *I Who Have Never Known Men* explores memory and female identity in the aftermath of catastrophe. Drawing on Simone de Beauvoir's idea of woman as "Other" and Judith Butler's work on gender as a learned and repeated construct, this thesis argues that Harpman reveals how patriarchal ways of thinking can survive even when the social institutions that once enforced them are gone. The older women in Harpman's novel reproduce familiar gender roles and hierarchies, not because they must, but because these patterns have been carried forward through memory and habit. At the same time, the narrator's upbringing—largely isolated from social instruction—exists as a foil to the fates of these women. Her development reveals both the possibility and the cost of a self formed without inherited gender expectations. Rather than suggesting that gender can be easily erased to achieve female subjectivity, Harpman shows how deeply identity depends on shared meanings, even when those meanings are oppressive at their root.

SANTIAGO GOLLARZA

Long-Term Neurobehavioral Impact of Prenatal Oxycodone Exposure

The purpose of this project is to explore the neurobehavioral impact of the opioid drug Oxycodone in mice exposed prenatally. Oxycodone is a commonly prescribed opiate often used as a painkiller during hospitalizations. However, oxycodone has been linked with poor outcomes in prenatal exposure, leading to birth defects and altered development. In the experiment, neonatal mice are exposed to the drug in utero, and then tested behaviorally. The usage of neuronal imaging techniques such as Rabies Retrograde tracing using the DREADD technique are performed in order to examine neuronal connectivity between sections of the brain and the orbitofrontal cortex (OFC). Chemogenic manipulation is used to examine whether the observed behavioral effects correspond with observed changes. The experiment found increased connectivity between the OFC and other brain sections and higher baseline activity in mice exposed to oxycodone prenatally. Additionally, behavioral changes in mice activated through chemogenetics were similar to those of mice exposed to oxycodone.

SHYLA GRANT

Understanding Microbial Adhesion Using AI

Marine plastic pollution exceeds 5 trillion pieces, providing novel abiotic surfaces for bacterial biofilms. As adhesive properties drive biofilm formation, studying microbial adhesion is vital for understanding evolution in changing environments. This study focuses on the Mannose-Sensitive Hemagglutinin (MSHA) operon, specifically the *mshA* gene, which encodes the fiber responsible for adhering to hydrophobic surfaces. By integrating AI-generated protein structures with adhesion assays, phylogeny, and modeling, this project characterizes *mshA* sequences and evaluates AI-predicted amino acid sequences. We explore the relationships between adhesion strength, protein structure, and microbial alleles. Results indicate that proteins with similar adhesive properties share structural motifs, and AI-generated sequences mirror natural ones. These findings bridge biotechnology and natural history, identifying ways to inhibit adhesion. This research offers potential applications for preventing pathogen spread in medical and food industries while illuminating how bacteria adapt to anthropogenic marine shifts.

JOLIE GUO

Utilizing Micro-Computed Scanning to Delineate Reproductive Morphology in *Paraplectana*

Reproductive morphology in Arachnids is crucial for species identification. The genital structures of spiders are highly species-specific and prevent interbreeding between related taxa through physical "locking" mechanisms, providing a non-destructive means to delineate spider species. Micro-computed tomography (CT) scanning enables high-resolution three-dimensional imaging of spider morphology and can reveal both internal and external differences between species. Here, we aim to (1) determine whether the endemic 'box turtle' variant of *Paraplectana walleri* is a color morph or a separate species, (2) characterize the pedipalp structure of the newly discovered male of *P. walleri*, and (3) preserve the morphology of these rare species by uploading models to Morphosource for use by other scientists. We predict the 'turtle' variant will be a new species with distinct internal copulatory duct structures and external epigynum genitalia. Our results will demonstrate the capabilities of micro-CT scanning in spider taxonomy and potentially describe a new spider species.

EVAN HECK

Application of a Novel Class of Lipid Probes for Cell Imaging

Cholesterol is strongly linked to many diseases, yet the routes and mechanisms governing intracellular cholesterol distribution are far from clear. To tackle that, we are developing and testing new lipid probes that resemble cholesterol behavior in the cell. In this study, we tested a group of environmental sensitive cholesterol probes (CNDs) that can distinguish cholesterol in different membrane compartments. Using a fibroblast cell line, we characterized their uptake and trafficking across different cell organelles, especially those involved in the transport and storage of cholesterol. Combining with organelle-specific probes and image analysis, we quantitatively evaluated cholesterol distribution among endosomes, lysosomes, and lipid droplets with subcellular precision. Our findings suggest that the new class of fluorescent lipid probes represent endogenous cholesterol behavior with high fidelity and there are multiple routes for intracellular cholesterol turnover. Thus these probes can provide new insights into disease-related dysregulation of cellular cholesterol metabolism.

JINDRY HERNANDEZ

The Interplay of Bicultural Identity with the Fading Affect Bias

Autobiographical memories that are negative often fade more over time than positive ones (fading affect bias). We explore whether culture might play a role. For instance, Hispanic culture often emphasizes on positivity and the avoidance of conflict or negativity, such as a trait known as *simpatía*, which is an extension of agreeableness. In our research, we seek to explore this interaction by giving participants the BFI-2 and *Simpatía* surveys followed by daily surveys for five days. Each day, they will describe a positive and negative event in conjunction with an emotional rating. A week later, participants will identify which diary events they recall and rate the current emotional tone of each event, along with how frequently it was rehearsed. I predict that bicultural individuals that identify more with Hispanic culture will have increased fading of their negative memories along with higher scores of *Simpatía* compared to agreeableness.

JAMES IRELAND

Zora Neale Hurston and Deconstructing the Negative Stereotypes of African American Women

In this paper, I will argue that Zora Neale Hurston, mainly through *Their Eyes Were Watching God* and *Dust Tracks on a Road*, along with a few essays and short stories, pushes back against the shiftless Mammy and the licentious Jezebel used to denigrate African American women. I will begin my paper by showing the origins of these stereotypes, from the physical torment of Black women during the Transatlantic Slave Trade, into the verbal and visual propoganda of the Jim Crow era and modern age. Then, I will formally introduce Hurston, her rural background, and her goals to illuminate Black people, focusing less on the hardships of Black women and more on their strengths and individuality. Finally, I will use her texts to validate my thesis that she challenges shiftless, licentious preconceptions of Black women through her numerous earnest depictions and challenges traditional gender roles that subjugated African American women.

REBEKAH JACKSON

Plastics and Microplastics: The Environmental Impacts and the Possibility of Microplastic Signatures as Human Geographic Markers

Plastic pollution, which harms animal and plant life and persists in landfills, has become a global environmental issue due to the rapid increase in plastic production and ineffective recycling systems. As plastics degrade, they form microplastics, which have been found across marine, terrestrial, atmospheric, and human environments, including blood, placenta, and bone marrow. In response to these environmental concerns, biodegradable plastics have been introduced as an alternative to conventional polymers. However, additional improvements will be needed for bioplastics to become a sustainable and effective choice. Advances in analytical chemistry have allowed the characterization of microplastic composition and origin. Microplastics contain distinct polymeric and isotopic signatures that can reflect their manufacturing feedstocks, geographic production regions, and environmental degradation. By integrating research on global plastic pollution, human microplastic exposure, bioplastic materials, and isotopic fingerprinting techniques, microplastic signatures are capable of functioning as geographic markers of human and environmental behavior.

MAI'SHUYN JEFFERS

The Role of US Immigration Policy in Traumatizing Guatemalan Transnational Families and How it Affects their Socioeconomic Prosperity in America

The United States' unilateral approach to managing immigration induces trauma and low socioeconomic outcomes for Guatemalan transnational families. Immigration reformists and researchers recommend a series of policies to alleviate trauma and insecurities for Guatemalan immigrants and their American children. The Los Angeles Declaration on Migration and Protection the U.S. funded \$686 million to support regional multilateral efforts to address humanitarian needs for migrants and displaced persons in the Western Hemisphere and welcomed 100,000 refugees globally in 2024. The LA Declaration demonstrates how the U.S. and Latin America can better allocate resources to support migrants' humanitarian needs and provide a more stable and secure migration process. My thesis analyzes the LA Declaration through a SWOT analysis and examines case studies of Guatemalan immigrants in Jupiter, Florida to better understand how a multilateral immigration policy can reduce trauma in the migration process and lead to better outcomes for migrants and their families across borders.

ALEXIS JILANI & BRIANNA LETTERIO

PawCycle

PawCycle is a start-up nonprofit organization whose mission is to significantly improve the welfare of shelter animals while simultaneously combating environmental pollution through innovative upcycling solutions. By strategically collecting clean, safe waste materials that would otherwise end up in landfills, we create affordable, durable infrastructure that helps reduce stress in animal shelters and promotes healthier living conditions for these vulnerable animals. Our comprehensive product line includes specialized soundproofing panels that reduce noise-induced anxiety, enrichment toys that stimulate mental health, and comfortable resting spaces that provide physical comfort, all thoughtfully crafted from repurposed materials that give new life to potential waste.

ABSTRACTS

VANESSA JIMENEZ

Gender Dysphoric Youth: Social, Behavioral, and Medical Concerns

Transgender youth are a particularly vulnerable population that experiences rates of bullying, suicidality, and co-occurring mental health problems at a rate substantially greater than their cisgender peers. In light of the most recent wave of research scrutinizing the effectiveness of gender affirming treatments for gender dysphoric youth, this literature review will examine the current standards of care endorsed by the APA for treating gender dysphoric children, adolescents, and adults, with a primary focus on prepubescent and adolescent transgender youth. This literature review includes a history section on the development of the cornerstone concepts for the biopsychosocial gender affirming approaches to treating gender dysphoria, as well as an evaluation of risks and ethical concerns regarding various gender affirming treatments, relevant case studies, and an acknowledgment of what is still unknown in this young, politically charged, and under-researched field.

ELLA KARAKADZE

Infauna Diversity in Sponges with Different Microbial Abundances and Microhabitat Interactions

Sponges are important components of coral reef ecosystems, providing habitat and food for diverse infaunal communities. However, it remains unclear how reef biodiversity changes based on the absence of scleractinian corals and whether sponges with various levels of microbial symbionts maintain it. This project evaluated the extent to which demosponges *Aplysina cauliformis* (HMA) and *Niphates erecta* (LMA) from Bocas del Toro, Panama, support infaunal reef biodiversity in the absence or nearby scleractinian corals. Results indicate that infaunal diversity was influenced by host species and microhabitat, with *A. cauliformis* supporting higher abundance and evenness. Infaunal density was lower in solitary sponges, however, community composition remained diverse. Phylum Annelida numerically dominated both sponge hosts. As coral cover declines and sponges increasingly dominate reefs, patterns suggest that sponge-associated infauna may alter ecosystem processes, including habitat complexity. Understanding these relationships provides insight into how reef biodiversity may reorganize under changing environmental conditions.

ROSHNI KANNAN

Constructing An In vitro Human-Cell Model to Study ApoE4 in Alzheimer's Disease

Basic research on the cause of Alzheimer's disease (AD) has mostly relied on animal models, especially transgenic mice with AD-related mutations. However, the intrinsic difference between mouse and human nervous systems significantly hinder the applicability of mouse-based findings. Recently, the development of induced pluripotent stem cells (iPSC) enables the generation of in vitro model systems simulating the human nervous system. Here, we obtained iPSCs derived from AD patients carrying ApoE4 (i.e., the greatest genetic risk factor for AD), have introduced AD-related mutations, and are generating major cell types in the brain (i.e., neurons and astrocytes). This allows us to investigate the role of ApoE4 in the origin and progression of neurodegeneration in AD. Particularly, we examine the distribution and trafficking of cholesterol among neurons and astrocytes, a determining factor for synaptic transmission and neuronal survival. As such, we will unravel the molecular mechanism underlying ApoE4's association with AD.

ABSTRACTS

VIVIEN LEVINE AND ASHLYNN HENDRICKS

Joyworks

Joyworks is a non-profit that seeks to bring art and dance to local rehabilitation centers, behavioral facilities, and nursing homes to increase the psychological and physical well-being of participants. Not only does it benefit those with neurological diseases, but our program benefits all. Unlike our competitors, we integrate art and dance using scientifically backed research to improve overall feelings of mindfulness and joy. We will fund our mission with local art and dance classes open for the public at a reasonable price of \$30 per person and an extra \$10 per guest. We are actively running art programs in nursing homes. We will also provide opportunities to donate and sponsor our non-profit through community events and outreach. While our program focuses on patients receiving treatment and elderly in nursing homes, our classes will have the same psychological and physical benefits. We give the opportunity for university students to volunteer and use their skills to teach our classes and run the program in nursing homes, which can help with resume building and experience. In the future, we hope to hire teachers and art and dance therapists to run the program, providing more professional services to our clients and customers.

JUSTIN MACALUSO

Virtual Narrative: Video Games as an Emerging Storytelling Medium

Some scholars have begun to investigate whether video games hold any value beyond just entertainment. By looking at the history of video game development, trends begin to show that developers have intentions beyond just entertainment when creating video games. Artistic expression, narrative storytelling, and scholarship have all become strong motivating factors for the creation of new video games. Video games, as a medium, have surpassed the common understanding that they are purely for entertainment, they have become strong storytelling devices that can represent different creative intentions. There are concerns, including that video games' depiction of violence could restrain any value, or that video games could have ill effects like anti-social behavior or reduce academic performance. These concerns are nullified by diversification of video game development and understanding of video games as a strong narrative medium rather than just entertainment.

CHRISTINA MCCABE

Exploring Public Art in Palm Beach County

Public art is often understood as art placed in public places and made visible to everyone. This thesis argues that visibility alone does not make art public. Instead, public art should be understood as a process of social engagement; one that is shaped by participation and community identity. This thesis has two parts: The first draws on the work of art historians and scholars, to discuss how public art has shifted away from monumental, state-controlled forms toward practices that invite dialogue and collective involvement. The second part includes interviews with individuals working within the public art space in Palm Beach County. These conversations explore how public art is experienced and negotiated in everyday practice. Together, theory and lived experience show that public art is not fixed or neutral, but relational, and tied to how communities see themselves in shared spaces.

ANDREW MCMILLAN

PATRIOT's Dilemma: How the USA PATRIOT Act Normalized Surveillance

In the immediate aftermath of the September 11, 2001 terrorist attacks, Congress passed the USA PATRIOT Act, granting the federal government unprecedented authority to conduct domestic surveillance in the name of national security. This legislation raises the question of whether post-9/11 counterterrorism policy represented a temporary response to extraordinary threat or a more fundamental transformation of American constitutional governance. I will argue that the Patriot Act is not just a legislative response to terrorism, but a shift in the structure of American governance, one that redefined privacy, altered the separation of powers, and created a precedent for the normalization of surveillance as an instrument of domestic policy. By examining the historical development of surveillance law, the political conditions surrounding the Act's passage, and the limited capacity of judicial oversight under conditions of secrecy and emergency, this thesis shows how expansive surveillance authority became institutionally entrenched rather than exceptional. As a result, constitutional liberty was recast as subordinate to permanent national security exigency, with lasting consequences for democratic accountability and civil liberties.

IAN MCMILLAN

Repackaging Reform

Every political generation attempts to replace "bloated" bureaucratic systems with "efficient" structures, though policymakers have repeatedly sought this ideal in the past. This movement, known as governmental efficiency, aims to deliver public services quickly and responsibly at a lower cost to taxpayers. However, these pursuits rarely clarify whether they prioritize performance efficacy or sheer cost reduction. Historical efforts like the Hoover Commission (1940s), Grace Commission (1980s), and National Performance Review (1990s) struggled with the paradox of being "lean" while maintaining democratic transparency and accountability. The Department of Governmental Efficiency (DOGE) is the latest iteration of this struggle. Established by President Donald J. Trump in early 2025 via executive order, DOGE was designed to eliminate bureaucratic waste and restore public trust. While presented as a modern solution, DOGE fails to achieve promised improvements because its cost-cutting measures undermine accountability, distort service quality, and repeat the shortcomings of earlier administrative reform efforts.

DANIELA METIANU

Unraveling Brain Connectivity: A Comparative Study of Neurodegenerative diseases in Alzheimer's, Lewy body, and Parkinson's Disease

Neurodegenerative diseases are a progressive disruption of neural pathways that lead to cognitive, behavioral, and motor impairments. Alzheimer's disease (AD), Lewy body dementia (LBD), and Parkinson's disease (PD) share overlapping pathological features yet differ substantially in how they alter brain connectivity and deviate from normal neurological function. Despite extensive research on each disorder individually, there's not a known start to how these diseases impact neural networks. This thesis aims to compare AD, LBD, and PD with respect to their effects on neurological pathways, synaptic communication, and functional brain networks, while contrasting these changes with normal brain organization. Further examination includes conducting a comprehensive review of current literature by looking at clinical research papers, meta-analysis, and other published literature reviews to employ statistical analyses of neural decline. What causes neurodegenerative diseases is still unknown, however, by synthesizing the findings of the studies, there could be a common ground in supporting the development for more targeted future research.

ZAHAVA MISSHULA

Stochastic Calculus

Stochastic calculus bridges both pure and applied mathematics. On the pure mathematics side, we incorporate measure theory as well as probability and statistics to define a measure space (X, S, μ) where S is a σ -algebra of subsets of X and $\mu(X)=1$. This is the probability space that all events are calculated on. We also look at random variables and Brownian motion with stochastic processes. Brownian motion serves as the basis for finance in applied mathematics. The Black-Scholes Model for options pricing was founded on that process.

LIZBETH MONCADA

Structural Analysis of Solvent Channel-Mediated Selectivity in Steroid Receptors

Glucocorticoids are steroid hormones widely used to treat inflammation, hormone-sensitive cancers, and autoimmune disorders. Prolonged use can lead to adverse side effects, particularly on the musculoskeletal system. To improve drug selectivity and try to minimize these side effects, we investigated an understudied solvent channel in the glucocorticoid receptor as a potential target for modulating receptor activity. Twenty-two ligands were synthesized with modifications that interact with this region. Compounds with selectivity for the glucocorticoid and progesterone receptors were identified using luciferase reporter assays and AlphaLISA assays for IL-6 suppression in A549 lung cells. Substitutions to the A-ring of novel steroids caused a dramatic difference in selectivity. Using molecular dynamics (MD) simulations, including classical, accelerated, and Gaussian accelerated methods, we uncovered differences in ligand-receptor dynamics that provide insights into the structural basis for selectivity. Simulations were analyzed using principal-component analysis (PCA) and weighted implementation of suboptimal paths (WISP) analysis.

ABSTRACTS

LAMINE MORRIS

The Politics of Potty Policing: The Issues with Criminalizing Public Restroom Use Based on Sex at Birth

Adams ex rel. Kasper v. School Board of St. Johns County, Florida (2022) was an 11th Circuit Court of Appeals case that ruled a school's public restroom sex segregation policy forcing transgender students to use the restroom not of their preferred gender survived scrutiny. The Facilities Requirements Based on Sex Act (HB 1521) was passed by the Florida Legislature the following year, making it a misdemeanor crime to enter a sex-segregated restroom which is not the same as your assigned gender at birth. The law is one of the many anti-trans legislations that perpetuates archaic, discriminatory Victorian values that not only heavily police trans bodies, but anyone who does not conform to the traditional gender binary presentation. By using queer analysis, this thesis will argue that Adams and HB1521 should be overturned and declared unconstitutional for violating the 14th amendment, Title IX, being unenforceable, and violating Florida's right to privacy.

ANNA MURPHY

Contemporary Famines as Strategy, not Tragedy: A Case Study of Weaponized Starvation in Gaza

Using an interdisciplinary approach, my research combines famine studies and settler-colonial theory with journalistic testimony, ending with an application to international humanitarian law. Israeli officials and ministers have on multiple occasions declared explicit intent to deprive the Occupied Palestinian Territories of food, water, fuel, and other objects indispensable to survival—officials later dismissed these declarations as emotional outbursts. Denialism, both legal and moral, is just one of many narratives Israel has spun about the conflict, including victim blaming, framing the mass starvation as an unfortunate byproduct of the war, and invoking necessary security measures to protect Israel's sovereignty. My thesis studies the resurgence of famines as intentionally produced and inherently political, analyzing the conflict between Israel and Palestine as a case study. This paper is intended to act as a warning against permissive environments to famine, to point out Israel's hypocritical and self-contradictory actions, and to outline the moral and legal implications of weakening humanitarian norms around the intentional starvation of civilians.

MALLORY NEAL

Infauna Communities in *Aplysina insularis* and *Niphates erecta* Sponges Using eDNA

As thermal stress reduces coral populations, sponges are projected to become the habitat-forming animals on coral reefs. However, it remains unclear whether variation in sponge microbial abundance influences their contribution to reef biodiversity and ecosystem function. Previous research has documented structural and chemical differences between high microbial abundance (HMA) and low microbial abundance (LMA) sponges; however, few studies have examined whether these differences affect associated biodiversity. This project examined whether an HMA sponge species, *Aplysina insularis*, and an LMA sponge species, *Niphates erecta*, from Fort Lauderdale, Florida, host distinct infaunal communities. Environmental DNA (eDNA) extracted from water within the sponge aquiferous system was used to characterize infaunal community composition. Preliminary results indicate that infaunal diversity was influenced by host microbial content, with *A. insularis* supporting higher infaunal diversity. This analysis contributes to our understanding of the ecological roles sponges may play on reefs where they are becoming abundant.

GRYFFYN OKOEE

Riders of the Perfect Storm: The Rise of the Warlord in Post-Soviet Afghanistan

Afghanistan immediately following the Soviet-Afghan War was the textbook definition of a failed state, with a non-functional central government, no economic policy, and no social support networks. Into this socio-political power vacuum stepped the warlord - the charismatic leader of a non-state-affiliated armed group, who controlled a territory through force. The chaos of post-war Afghanistan was the perfect storm required for warlords to appear en masse; the absence of basic functionalities a state would provide, such as security, supplies, and stability, were provided on a regional level by warlords, in exchange for popular loyalty. This presentation will analyze the how and why Afghanistan ended up as a patchwork of warlord-led proto-states, concluding that sociopolitical maneuvering, cultivating an intrinsically loyal base, and maintaining stable relationships were key to the success of an Afghan warlord.

JORDAN POMERANTZ

Evaluation of Stranded Loggerhead Sea Turtle (*Caretta caretta*) Sex Ratios Relative to Population Baselines

Numerous studies have analyzed sea turtle stranding reports documented in the Sea Turtle Stranding and Salvage Setwork (STSSN); however, sex ratios have yet to be explored. To evaluate the relevancy of sex in sea turtle strandings, chi-square tests were applied to an STSSN dataset in Florida from January 2018 to August 2025. Free-ranging loggerhead turtle baselines were 2F:1M for juveniles/subadults (immature) and 4.4F:1M for adults with 109 and 217 stranded turtles analyzed, respectively. Results found immature males were disproportionately impacted by vessel strikes, and mature males were disproportionately impacted by vessel strikes, anthropogenic interactions, and predator encounters. Neither group found significant findings for fibropapillomatosis or cold-stunning. Analyzed reports represented only 4.87% of immature and 17.53% of mature turtles due to missing data, primarily unknown sex. In future work, we will sex immature turtles using testosterone analysis to improve sex ratio estimates for conservation efforts.

SAMANTHA REYES

Generational Trauma: Tracing the Line from Colonization to Contemporary Trauma

This research investigates the systematic "Othering" most non-White people experienced, drawing a line between European colonization and the imposition of Western ideologies and normative behaviors on all non-Western people. More specifically, I trace the historical trajectory of the development of whites' perceived superiority as well as the ways in which Eurocentric pseudo-scientific theories and imperialistic rhetoric provided an avenue to dehumanize, torture, and culturally destroy non-Western communities and peoples. I work to uncover how bias and dishonesty within the scientific and clinical research/medical communities supported the perpetuation of racial violence, Nazi racial policies, as well as the unethical conduct of "experiments." Ultimately, this research supports that colonization and the trauma that followed are deeply imbedded and inherited in marginalized communities; the generations of families who have inherited this trauma may in current-day experience various mental illnesses, including PTSD and eating disorders, as a result.

SAMANTHA REYES

Influences of Neuroticism, Extraversion, and Agreeableness on Memory Rehearsal and Fading Affect Bias

The Fading Affect Bias occurs when negative emotions fade faster than positive emotions. The purpose of this research is to assess the role of Extraversion, Agreeableness, and Neuroticism in emotional regulation (as it relates to the FAB). Participants completed the Big-Five Inventory-2 (BFI-2) to measure their personality. We had two different designs for this project: prospective and retrospective. This research allowed us to explore the differences in terms of individuals' objective versus subjective experience of emotional change. Overall, this research will help demonstrate how coping mechanisms, driven by personality, affect the long-term emotional development of autobiographical memories. We expect to see participants who are higher on neuroticism and privately rehearse their emotions to experience less fading of negative emotion than those who are lower on neuroticism and rehearse their emotions socially.

CAROLINE RIBEIRO

"Law, Memory, and Justice" - Lessons from Spain and Germany's democratic transitions

Spain and Germany are both examples of successful transitions from repressive and authoritarian regimes, into democratic states. Yet, they adopted fundamentally different approaches to constitutional design, memory preservation, and transitional justice. Spain's transition following the Franco dictatorship, was negotiated, prioritizing political inclusion for the sake of stability. This approach produced a broadly protective constitutional framework, but ultimately contributed to fragmented memory policies and limited accountability, leaving the democracy more vulnerable to the reemergence of authoritarianism. In contrast, Germany's transition after World War II was externally supported and grounded in a more explicit rejection of authoritarianism. This led to institutionalized democratic militancy, with state-led efforts in legal accountability, and later public memory. By comparing these cases, this project argues that democratic durability depends not only on political freedoms, but on how effectively states confront past injustices and institutionalize safeguards against authoritarian relapse. Crucially, it finds that international support during transitional periods enable states to peruse accountability without significantly compromising stability. Spain's transition was marked by limited international pressure for accountability, delaying efforts for justice and implementation of democratic self preservation policies. While Germany's postwar transition occurred under conditions of occupation that are not broadly replicable, the case nonetheless illustrates how external reinforcement can facilitate earlier and more comprehensive reckoning. These findings suggest that international engagement, even short of direct intervention, plays a key role in shaping how democracies sustain themselves over time.

SHEILA RIOS

Is Rehearsal a Mediator Between Personality and Fading Affect Bias?

As memories become older, the feelings tied in with those memories fade. Fading tends to happen more within negative memories than positive (fading affect bias; FAB). We conducted a prospective study to explore how private rumination and social rehearsal may mediate the relationship of personality traits with FAB. Participants took an initial personality survey. Then participants took a survey daily for five days where they provided a negative and positive event that occurred to them that day along with their emotion intensity ratings for that event. A week from the last daily survey, participants completed a final survey re-evaluating their rehearsal frequency and their emotional intensity. I expected that those who ruminated more often would be higher in neuroticism and experience more FAB than those who socially rehearsed and were higher in extroversion.

DELANEY ROSENBLATT

Christians for Contras: The Reagan Administration's Mobilization of Evangelicals into Foreign Policy

This thesis investigates governmental and non-governmental efforts taken to mobilize conservative Christians in the United States into the realm of America foreign policy. After federal funding for the U.S.-backed Nicaraguan counter-revolutionary army (the Contras) was prohibited by the 1982 Boland Amendment, policymakers were left with limited options to secure funding for Reagan's "freedom fighters". An emerging alternative was found in an increasingly centralized base of conservative-leaning Christians, made up of groups like Pat Robertson's Christian Broadcasting Network, and other adherents to the 'New Christian Right'. Although domestic political involvement of the New Christian Right has been well documented, the origins and evolution of their impact on foreign policy has received less scholarly attention. I argue that mobilization efforts were aided by the characterization of Latin American Catholic liberation theology as both a political and religious threat, and by the organizational dynamics of conservative Christian networks. The pursuit of Christian support for Contras (and the emergence of the competing Sanctuary movement) demonstrates the function of religion as a tool for political mobilization and provides insights for understanding Christian nationalism in the United States today.

ABSTRACTS

MYA ROUSSEAU

Exploring Morality in Nathaniel Hawthorne's Works

The writings of Nathaniel Hawthorne use fantastical images in realistic settings as examples of crime and punishment meant to evoke contradictory feelings of remorse and contentment in readers. Examining popular works such as *The Scarlet Letter* and "Young Goodman Brown", as well as the mysterious romance *The Marble Faun*, reveals that the purpose of Hawthorne's works was to prove a moral ground both for himself and his readers. Scholars have scrutinized his writings for clues regarding his views on morality, and it is clear that he believed in a strict system of penance for every sin despite complicated motives. In this way, Hawthorne's works demonstrate how literature contributes to moral philosophy.

MALLORY SCHUMAKER

Pocket Reef

Pocket Reef is a website platform designed to ease water quality management in marine home aquariums. Water quality is the most important factor in keeping marine aquaria alive, but sadly, many hobbyists find it hard to understand or keep track of progress. Pocket Reef strives to reduce the impact of the marine aquarium hobby while supporting natural reef restoration efforts. Our process is simple, fill out a test form, receive instant feedback via color code, view water history and graphs, and watch your tank thrive. By making it easier to manage water quality, Pocket Reef gives users a better understanding of their tank. Use of our premium features will support restoration of natural reefs through Pocket Reef's mission to start donating after our first year. Users have an opportunity to grow their reef while helping to protect the natural ones.

VINCENT STAFFORD

Algorithms for Domination in Graphs

Many significant computational problems are NP-complete, which are conjectured to require superpolynomial time to solve problem instances exactly. We survey one such problem: the minimum dominating set problem (MDS), and the approximation algorithms available to solve it in tractable time. To achieve this, we construct a self-contained framework of approximation techniques: formalizing optimization problems, relating MDS complexity to vertex cover and set cover, and evaluating the complexity bounds of approximation methods. We find that the fastest direct method runs in $O(1.5134^n)$ time while greedy heuristics run in linear time with provable logarithmic-factor approximation guarantees. We also find that polynomial-time approximation schemes exist for planar graphs, demonstrating that a wealth of algorithmic options exist for solving NP-complete problems.

ETHAN STARK

A Critique of Using SSB Ban Modeling to Predict Health Equity Improvements

To combat increasing obesity rates in the United States, law makers have proposed enacting a ban on sugar sweetened beverages (SSBs) within the Supplemental Nutrition Assistance Program (SNAP). Musicus et al., (2025) modeled an SSB ban within the SNAP program, and predicted it would prevent 279,000 cases of obesity over a ten-year period. In this paper, I will critically examine Musicus et al.'s model. I argue that the following will likely reduce the impact predicted by Musicus et al.: they likely underestimate the caloric intake of consumers after the SSB ban; they likely underestimate substitutions with other equally nutritionally deficient foods; they ignore real-world evidence casting doubt on the effectiveness of SSB restrictions; they likely overstate the significance of the weight lost, among several other factors. As a result, I forecast that the reductions in obesity predicted by Musicus et al. will not occur if the policy is enacted.

KASEY STEELE

Balancing Innovation and Regulation: Legal Implications of Stem Cell Research

Human pluripotent stem cell research faces the challenge of balancing scientific innovation with legal and ethical regulations. With advances in stem cell biology, regulatory frameworks shape research practices and clinical applications. This study systematically reviews scientific, legal, and policy documentation published between 2010 and 2025 to compare how the United States and the European Union regulate human stem cell research and clinical applications. This analysis examines how legal approaches impact research development, clinical trials, and innovation. The findings suggest that while regulatory oversight promotes safety and ethical approaches, it can delay progress. The U.S. emphasizes a single FDA system based on classifications, while the EU prioritizes a centralized marketing authorization pathway. This analysis argues that the regulatory framework itself determines which stem-cell research reaches patients, how fast, and under what legal and ethical conditions.

DIONISIA TOUZIN

Doxorubicin as a Potential Treatment for Pulmonary Vascular Disease

Human pulmonary arterial smooth muscle cells (HPASMCs) and human pulmonary arterial endothelial cells (HPAECs) are highly implicated in the pathophysiology of pulmonary vascular disease (PVD), contributing to vascular remodeling, excessive proliferation, altered calcium dynamics, and resistance to cell death. Doxorubicin, an FDA-approved chemotherapeutic drug, is known to alter calcium handling and induce cellular senescence in cardiovascular cells, but its effects in pulmonary arterial cells remain poorly characterized. We hypothesized that Doxorubicin could ameliorate pulmonary vascular pathology by modulating calcium dynamics and inducing cell death in diseased cells. We used an in vitro approach to compare naïve vehicle-treated controls with HPASMCs and HPAECs exposed to acute or prolonged Doxorubicin treatment, measuring calcium dynamics by Fura-2 imaging and cellular senescence by Western blot analysis. These findings will advance the understanding of therapeutic interventions for PVDs and offer insights into potential molecular targets for preventing or mitigating pulmonary vascular pathological processes.

NICHOLAS TOZZO

Meaningful Learning in the General Chemistry Laboratory

Students taking undergraduate General Chemistry laboratory courses bring diverse backgrounds in science and mathematics, and for many, these classes are their first experience with systematic data collection and analysis. Meaningful laboratory learning requires that students engage intellectually, socially, and physically in the construction of new knowledge that is connected to their prior life experiences. The present study examines student engagement with lab procedures and data analysis skills in a General Chemistry I lab sequence culminating in a laser refractometry experiment. Following introductory activities on measurement, descriptive, and inferential statistics students applied linear regression techniques to determine the concentration of an ethylene glycol solution. A Likert-type survey was completed to assess students' understanding and confidence with both the experiment and the underlying mathematical concepts. Exploratory factor analysis is used to evaluate the survey instrument and student responses. Results inform possible improvements to laboratory design to better support student engagement and learning.

KAREN WALKER

The Eroding Sixth Amendment: Florida's Rewriting of the Speedy Trial Rule

Florida's Rule 3.191 ensures that every person charged with a crime is brought to trial within a reasonable time frame. I argue that the Florida Supreme Court's 2025 revisions to this rule weaken the Sixth Amendment right to a speedy trial by favoring prosecutorial efficiency over defendants' right to due process. The revisions strain public defenders' resources and will increase uncertainty for indigent defendants about when their cases will actually be heard, prolonging their incarceration and limiting their access to effective counsel and increasing the likelihood that they accept guilty pleas regardless of their culpability. Florida's rule change reflects a broader trend in which a concern with efficiency and crime control erodes due process protections provided by the Constitution, and diminishes public trust in the criminal justice system. Preserving due process requires reforms that balance efficiency with meaningful protection of defendants' rights.

RIA PARMAR

How is Chemistry Being Used by Science Fiction Writers

This investigation explores how chemistry is used and represented in science fiction media through a two-part analysis. Part 1 examines *Nature Futures* short stories (2015–2020), ranking each on a 1–3 scale based on the focus of chemistry, with a ranking of 1 indicating chemistry as the primary focus. The short stories ranked 1 were further categorized by their specific chemical themes, such as materials chemistry, biochemistry, medicine, and more. Part 2 then further evaluates the medical accuracy of *House M.D.* Season 4 as a case study in televised science, assessing diagnostic reasoning, disease portrayal, and ethical practice. Results show that while *Nature Futures* frequently employs chemistry in conceptually accurate and diverse ways, *House M.D.* presents mixed accuracy: strong depictions of pathophysiology, but significantly lacking in testing timelines, physician roles, and ethics. Overall, science fiction effectively communicates scientific ideas but often sacrifices realism for narrative impact.

JASON PINDELL

The Remote Sensing Detection of Sediment-Derived DOC to CDOM in Surface Waters

Oceanic sediments represent the largest known carbon store on the planet and can release carbon into coastal waters. Colored dissolved organic matter (CDOM), the visible portion of dissolved organic carbon (DOC) in the water column, comes from fluvial (river-derived), biological, and sediment-derived (SD) sources. SD CDOM substantially affects carbon in the Northern Gulf of Mexico (NGoM). Due to limitations in satellite remote sensing (RS) for water depth and clarity, SD CDOM is challenging to measure and classify using RS. We use machine learning (ML) to algorithmically identify SD CDOM surfaced, both by high-energy weather events such as storms and by natural processes in dynamic NGoM waters, using optical and physical RS properties. The approach shows promise in identifying sediment-derived CDOM in regions such as the Yucatan Peninsula. The accurate classification of SD CDOM can help inform global carbon budgets.

ABSTRACTS

SHELBY WINGO

The Importance of Pedigree within Dog Sports: Undergraduate Senior Honors Thesis Project

When looking for a dog, dog owners are faced with the choice of purchasing a dog with a well-documented family lineage, a rescued dog with no background information, or something in between. In social science literature about pet/human interactions there is little to no discussion about what motivates these decisions on a deeper level. Focusing on the southwest Florida dog sport community participating in AKC sanctioned events, I explore the purpose and importance of dog pedigree, arguing that owners make decisions about dog ownership based largely on sentiment surrounding a dog's presumed personality and strengths, due to their background (assumed or confirmed). Dog sports provide these owners a social community to exercise and harness the dogs' natural attributes and to further strengthen their owner to dog bond. Through this ethnographic project, I aim to represent the lived experiences of dog sport participants and their dog ownership journey

AMBER WOLF

Did Eye Really See That?: Eyewitness Testimony and Faulty Memory Recollection Within the Legal System

Eyewitness testimony has been a prominent aspect of the legal system; however, distortion of these memories can occur between witnessing the event and testifying about what they saw. These distortions can lead to major issues, such as wrongful convictions of innocent civilians. This thesis aims to look at the history of eyewitness testimony through prior and current court cases and psychological studies to fully understand how eyewitness testimony has developed over the years, along with where improvements can be made. Using prior studies, changes could be implemented into the legal system in order to make eyewitness testimonies and identifications more reliable.

Abstracts: Visual Arts and Creative Research

ALPHABETICAL BY STUDENT'S LAST NAME

ANGELICA ESPINOSA-PENA

At the End of This Universe

At the End of This Universe is a game based on a conversation I had with a peer of mine. The topic of "the god of time" had come up and prompted me to begin thinking about what reality would look like for the person – or in this case, people – who overlook the concepts that make up reality. That's what birthed Amon and Rova. Their mechanics – and thus their way of life – were based around common perceptions and sayings of space and time. Time is always slipping, and thus it is stated that Amon goes through many life cycles. Contrasting Rova's constant state of being, that space is all around and never-ending. And even as they're presumably gone, Wendel – our stand-in for reality – is still there, keeping the spirits of Amon and Rova along with him.

GAVIN FUERTE

Living with Dementia: Research Paper and Video Game

Dementia represents a complex clinical syndrome characterized by progressive cognitive decline that significantly impairs daily functioning and independent living. This paper provides a comprehensive examination of the scientific background of dementia, including its definition, classification systems, epidemiological significance, underlying pathophysiological mechanisms, major subtypes, risk factors, disease progression patterns, diagnostic approaches, and current treatment strategies. Dementia is not a single disease entity but rather an umbrella term encompassing multiple disorders that cause abnormal brain changes leading to cognitive deterioration beyond normal aging. Accompanying this paper is a video game following a biologist, Iris, as they experience the deterioration of their own mind due to Alzheimer's. The player will experience three days over the course of Iris' multi-year descent, with the disease progressing with each day. Dementia can also negatively impact relationships, such as the deterioration of Iris's bond with their daughter, Jenessa, who helps take care of them.

LAUREN IMBERT

The Perfect Match

Romantic comedies are a blended genre that focus on a central love story, typically romantic, with humor serving as a significant element in storytelling; not just for entertainment, but also as a tool for driving the plot forward. Romantic comedies typically focus on internal conflict, with the main character(s) having to overcome something within themselves before they can love someone else. In my group short film project, "The Perfect Match", the characters Lucas and Francesca attempt to set their friends up, believing they are perfect together, unaware that the love they are trying to help their friends find can also be found within themselves. "The Perfect Match" also takes on the message that any relationship is more genuine when it's not forced, but rather when it's allowed the time to flourish and grow on its own.

MALIA MCGETCHIN

Alien Plague: Save the Hospital

This is a little game where you play as a human doctor sent to an alien hospital currently experiencing a crisis - an infectious gas is poisoning the entire east wing! Talk to NPCs to gain information, and look for a way to get past the toxic fog to save the two helpless patients being exposed to the poison while stuck in their rooms. Be careful not to expose yourself to the infection while you're at it; your suit may keep you safe from the alien atmosphere of the hospital, but those built-in filters won't keep out the dangerous miasma. If you do get infected, fear not! A quick dose of Miracle Pills (tm) will have you feeling much better. Be careful, have fun, and SAVE THOSE PATIENTS!!

KATTARYNA SALZMAN

Digital Map Display

Digital Map Display is a software for tabletop role playing games. It is designed for use in shorter games with fewer play sessions and a beginner audience. The software prioritizes simple visual interactions with the play area to increase player immersion through sound, visuals, and interaction. When the game first loads, players see the play area as well as a few simple tools. The tools allow the Game Master to better facilitate interaction and stories. The software and the computer it runs on are packaged in a custom designed box for ease of transport. The Digital Map Display is the practical component of a thesis that explores and compares player friendly ways to interact with complicated tabletop game map systems while sustaining and maximizing immersion.

CAITLYN SEAL

Dante's Insta-ferno

I need to write. I need to work. I need to create. Yet it beckons. It tempts me, and I fall into consumption. "Watch this." "Click this." "Buy this." "Keep your attention here." "Focus." "Stay." Just keep scrolling.

This project is a descent into an expressive reality where social media platforms are mapped in parallel to Dante Alighieri's Inferno, and its nine circles of Hell: Limbo, Lust, Gluttony, Greed, Wrath, Heresy, Violence, Fraud, and Treachery. Like the poet, the artist becomes a witness, testifying, confessing, and admitting arrival to the lowest levels.

One cannot speak of Hell without having been there. Yet does just having been, admit sin? This is not for shame, nor fear, nor for control. Yet in the infinite depths of algorithmic design, perhaps wonder, where do you want to spend your time? If attention be eternal, then Hell is the feed.



ABSTRACTS

ART 1202C: HONORS DESIGN AND COLOR PHENOMENA

Featured works created by students in ART 1202C: Honors Design and Color Phenomena: London Cohn, Taynalecia Hall, James Lee, Elle Linetsky, Madison McAdoo, Melina Migoya and Caitlyn Seal

IDS 3131C: AUDUBON'S SCIENTIFIC ILLUSTRATION

Featured works created by students in IDS 3131C: Audubon's Scientific Illustration: Yusuf Asad, Ami Bireta, Lauren Blake, Daniel Bokor, Caelyn Butler, Samantha Croge, Sophia De Almeida Ferreira, Akhila Gourabathina, Alejandra Guevara Padron, Alice Kim, Rachel Knowles, Kayla Linder, Elle Linetsky, Victor Lopez, Malia Mcgetchin, Mario Medina, Kayla Riley, Caitlyn Seal, Isabelle Solages, Rachel Thum, Austin Ward, Kyria Wickham, Angela Yu

14801: DRAWING I

Featured works created by students in 14801: Drawing I: Isabel Blanco, Lee-Jae Gordon, Ivoree' Hendrix, Rachel Knowles

14799: ELEMENTS OF VISUAL THINKING

Featured works created by students in 14799: Elements of Visual Thinking: Isabel Blanco, Brooke Harvey, Cassandra Liburd

Abstracts: Research Poster

ALPHABETICAL BY STUDENT'S LAST NAME

ENITAN ADENIGBAGBE

LTD Dynamics in NLGN1 Mutant Mice Models: A Patch-Clamp Study of Amygdalar Circuits LTD

Neurexins are a type of postsynaptic adhesion protein that shape how neurons connect and communicate. Neuroligin-1 (NLGN1) is found at excitatory synapses and helps organize glutamate receptors, making it essential for long-term changes in synaptic strength. Mutations in NLGN1 have been linked to autism spectrum disorder and are known to alter synaptic plasticity in the hippocampus. However, much less is known about how NLGN1 mutations affect plasticity in the amygdala, a region important for emotional learning. Long-term depression (LTD) in the lateral amygdala is thought to help refine emotional memories and regulate fear responses. In this project, I am studying LTD in the amygdala of NLGN1 mutant mice models using whole-cell patch-clamp electrophysiology to determine how excitatory synapse-specific disruptions may alter emotional circuit function.

DANNY ANGELES

Microgravity Effects on the Immune System in Simulated Spaceflight

Living and working in outer space can have many serious effects on the human body, including alterations in immune function. Research has shown that microgravity can change how immune cells develop and respond, but the exact reasons behind this are not fully understood. This systematic literature analysis analyzes eight articles to examine how microgravity affects both innate and adaptive immunity. Simulated microgravity platforms were used to assess patterns of immune system change by mimicking spaceflight conditions. This analysis aims to identify how microgravity disrupts cytokine signaling and PBMC activation pathways. Characterizing these responses contributes to a clearer understanding of how the human immune system reacts to spaceflight conditions and provides a foundation for future research on astronaut health.

EMILY ARBESFELD

Functional characterization of *Drosophila* Attractin in Insulin and Stress Signaling

The highly conserved Attractin (Atrn) transmembrane protein regulates appetite in the hypothalamus through endolysosomal trafficking of melanocortin receptors. Loss of Atrn function has been linked to type 2 diabetes, sleep disorders, and neurodegeneration, suggesting broader roles in G-protein-coupled receptor signaling in distinct tissues. Here, we show that the *Drosophila* Atrn homolog, Distracted (Dsd), is widely expressed in the central nervous system, sensory neurons, midgut, insulin-producing cells, and other neurosecretory cells involved in metabolic and stress regulation. We further demonstrate that Atrn homolog expression is predominantly regulated post-transcriptionally by microRNAs, indicating that precise temporal control of protein levels is critical for context-dependent function. We compared null mutants, animals expressing Dsd lacking its endogenous 3'UTR, and control animals with respect to longevity under conditions that challenge insulin and stress signaling. The results imply that the disruption of Dsd expression resulted in reduced lifespan and impaired physiological resilience to metabolic stress.

ADOLFO ARTIGAS

A Quantitative Analysis of Sea Turtle (*Chelonia mydas*, *Caretta caretta*, *Lepidochelys kempii*) Suture Morphology

Sea turtle shells are formed of modified ribs which are sandwich composites. The sandwich structure allows a balance between physical protection and pressure associated with diving at depth. Carapacial sutures, tight joints found between adjacent bones, connect modified ribs with collagenous fibers. Previous research on freshwater turtles suggests that sutures are sinuous (highly convoluted), promoting strength under compression. Limited research has explored the form and functional significance of sutures in marine turtles. To explore suture morphology, and potential ontogenetic effects, we analyzed sutures in green (*Chelonia mydas*), Kemp's ridley (*Lepidochelys kempii*) and loggerhead (*Caretta caretta*) sea turtles. Samples from each species were scanned using micro-computed tomography and digitally analyzed in Dragonfly™ software to quantify sinuosity and span. We found that as body size increases, sinuosity decreases while span remains invariant. These results suggest that sutures may promote rigidity in juveniles (high sinuosity) while allowing increased flexibility in adults (low sinuosity).

IAN AVILES

Identifying factors contributing to rheumatoid arthritis development by high-throughput gene expression analysis

Rheumatoid arthritis (RA) is a chronic autoimmune disease impacting almost 1% of the world's population. The cause of RA pathogenesis in humans is unknown and may result from a combination of genetic and environmental factors. MMP-13 initially cleaves type II collagen (COL2) at the ¾ point, followed by progressive cleavage of resulting fragments. Anti-citrullinated protein antibodies (ACPAs) inhibit MMP-13 binding to collagen at various stages, leading to production of collagen fragments that differ from those found under normal physiological conditions. These abnormal COL2 fragments may influence immune response, potentially enhancing pathogenic or regulatory activity, and altering chondrocyte behavior, contributing to the onset of RA. This project aims to identify the role of the identified fragments in the initiation of RA development by introducing them into a healthy cartilage model. Roughly 800 genes were analyzed using Nanostring technology to assess changes indicative of pro-arthritis or anti-inflammatory transformation in the cartilage.

VIDUSH BALMURI

Confirming Wild-Type TP53 in Cancer Cell Lines to Support RORβ-Linked Antiproliferative Phenotypes

TP53 is a central tumor suppressor gene that regulates cell cycle control, DNA repair, and apoptosis. Previous work from our lab showed that overexpression of RORβ increases p53 protein levels and reduces proliferation in a bone cancer cell line. However, interpretation of these effects depends on whether TP53 is wild type, as mutant p53 could confound antiproliferative outcomes. To address this, we investigated the TP53 mutation status of MG63 cells and additional cancer cell lines of interest. Genomic DNA from MG63, Y79, U2OS, and SH-SY5Y cells was isolated, PCR-amplified across TP53 exons 2–11, and analyzed by Sanger sequencing. MG63, Y79, U2OS, and SH-SY5Y cells were confirmed to have a wild-type p53 gene, establishing a genetic foundation for attributing RORβ-associated antiproliferative effects to p53 expression rather than TP53 mutation. Together, this work enables downstream investigation.

ERIN BELL

Evaluation of Microglial Activation in Hippocampus of Mblac1 Knockout Mice

Neurodegenerative diseases are a class of progressive neurological diseases that result in the gradual death of nerve cells known as neurons in the brain and spinal cord, leading to a decline in cognitive function. Neurodegeneration is in part driven by a neuroinflammatory response in the central nervous system (CNS) by resident immune macrophages and a subset of glial cells known as microglia. Microglia and their morphological changes are often a response to changes in cellular health, and can be indicative of increased oxidative stress in neurodegenerative conditions. Recently, the gene *Mblac1* was discovered to serve a novel role in the regulation of a copper reductase as well as a risk factor for the development of Alzheimer's Disease (AD) within individuals with comorbid cardiovascular disease (CVD).

RACHEL BENBASAT

Ecofeminist Entanglements

I discuss the environmental philosophical framework known as Ecofeminism and its approaches to challenging patriarchy. The discussion includes its conceptualization of women and nature focused on women's potential to produce life as well as conceptions of power dynamics related to the aversion of women in society and history. I discuss ecological activism associated with women and its relation to different forms of Ecofeminism. I compare Ecofeminism to other approaches to feminism and to other ecological philosophies, such as deep ecology. I conclude by sharing the present status of Ecofeminism and where it may be heading, addressing questions about how it might be viewed as inclusive and suited to the social and ecological diversity of the modern age.

VARSHITHA BOJANAPATI

South Asian Saponaceous Plants (*Sapindus mukorossi* and *Acacia concinna*) for Handwashing Efficacy Using Sterile Swab Sampling

Around the world, billions do not have access to the soap and water necessary for proper handwashing. This study takes a novel approach to the soap inaccessibility problem and provides insight into the viability of *Sapindus mukorossi* and *Acacia concinna*, two saponaceous plants found in India, to serve as soap alternatives in low resource, rural communities. Spectrophotometric assays were used to quantify total phenolic, flavonoid, and saponin content of aqueous crude extracts. A colorimetric broth microdilution was utilized to determine the antibacterial properties of the extracts, which range from strong to moderate for *Bacillus subtilis* and *Escherichia coli* K12. Efficacy in handwashing was tested using a sterile swab sampling procedure. Preliminary results with a silicone hand model suggest the plant extracts perform as well as commercial bar soap. Identifying a low cost, effective solution using saponaceous plants already found in communities can increase levels of handwashing, preventing common infectious diseases.

KRISTA BOSE

O-GlcNAc Serine Building Block for Tau Peptide Assembly

Tau is a microtubule associated protein essential for maintaining neuronal structures. It plays a critical role in stabilizing the cytoskeleton in healthy neurons. Its dysregulation is a hallmark of Alzheimer's disease. This research project was focused on the synthesis of a Ser-GlcNAc glycosylated building block for direct use in solid-phase peptide synthesis (SPPS) of tau glycopeptides. The key step was the stereoselective O- β -glycosylation of N-acetyl-D-glucosamine onto the serine side-chain hydroxyl. The synthesis route begins with Troc protection and acetylation of D glucosamine, to generate Troc GlcNAc donor, which undergoes BF₃ promoted oxazolinium formation to yield the O β GlcNAc Ser residue. Subsequent step was OPfp activation, followed by Troc removal and amine acetylation to afford the glycosylated building block compatible with SPPS. All steps were monitored by TLC, purified by column chromatography, and characterized using ¹H and ¹³C NMR spectroscopy and HPLC. The resulting building block will then be used for SPPS of the tau peptide.

CLAUDIA BUDA

Genetic Variation in SLC6A4 and Cytochrome P450 Enzymes: Implications for Personalized SSRI Treatment in Major Depressive Disorder

Depression is one of the most common psychiatric disorders worldwide, with a significant impact on quality of life and global health. Despite the widespread use of selective serotonin reuptake inhibitors (SSRIs) as first-line treatment, individual responses vary significantly due to genetic differences. Variations in the serotonin transporter gene (SLC6A4) and the cytochrome P450 (CYP450) enzyme family have been identified as key factors influencing the efficacy, metabolism, and tolerability of SSRIs. This paper examines the impact of polymorphisms in SLC6A4 and CYP450 on SSRI pharmacodynamics and pharmacokinetics, explores their potential for guiding personalized antidepressant therapy, and discusses the ethical and practical considerations of implementing pharmacogenomic testing in clinical psychiatry.

VALENTINA CAMPOS

Control of the Extracellular Matrix by Complement Component C1q

The extracellular matrix (ECM) is essential for supporting neural function and synaptic plasticity. The ECM is regulated by microglia, the macrophages of the brain. However, the molecular mechanisms underlying ECM remodeling remain poorly understood. Complement component C1q, known for its role in immune signaling, also regulates synapse elimination via microglia-mediated phagocytosis. Our lab identified strong extracellular accumulation of C1q in the hippocampus, where it colocalizes with chondroitin sulfate glycosaminoglycans (CS-GAGs), a major component of the ECM. We hypothesize that C1q contributes to ECM organization either by providing a structural role or by activating microglia-dependent ECM phagocytosis. To test this, tissue from C1q knockout and wild-type mice were analyzed using electron microscopy, with quantitative assessment of interstitial space and cellular density. This study aims to determine whether the loss of C1q protein alters the hippocampal extracellular landscape and to reveal non-canonical roles of complement signaling in regulating the neural ECM.

ADELAIDE COHN

How Aristotle and Lesbian Pulp Fiction Expose Personas in the LGBTQ+ Community

Personas, or identities created by an individual to express themselves, in the LGBTQ+ community are commonly viewed as shadows or facades hiding the true nature of a person but genuinely convey the natural tendencies and personality traits of an individual. In this paper, I will argue and explain that personas enable LGBTQ+ people to live as their true selves, as proven through arguments in Aristotle's Poetics and via an examination of Poetics arguments through Pulp's discussions of lesbian pulp fiction. I will present my findings via poster to properly depict, visually, the correlations between Poetics and Pulp. Aristotle's Theory of Tragedy finds itself in Pulp, which discusses a tragedy occurring to a pulp fiction writer, via mimesis in art, plot structure, and character. These findings conclude that LGBTQ+ individuals artistically use personas in order to survive, creatively finding ways to express themselves in the face of oppression.

LONDON COHN

Radial Glia Morphology and its Relationship to MEP Glia in the Zebrafish Spinal Cord

The motor exit point (MEP) transition zone marks the divisions of, and interactions between, the central nervous system and the peripheral nervous system. This dynamic structure, comprised of radial glia endfeet, develops so that neurons and glia reside in their respective nervous system. MEP Glia are a cell population that cross this boundary; however it is largely unknown how they do so. This study examines how changes in the structural integrity of the endfeet connectome affects its permeability to other cell types. To do so, timelapse imaging of transgenic zebrafish lines will be utilized to observe the migration of MEP glia as well as their interactions with radial glia structures. Additionally, immunohistochemistry and 3D rendering will be performed on 2, 3, and 4 days post fertilization AB* zebrafish embryos to quantify fluorescence profiles (based on single z-plane images) of the morphology of the radial glia boundary in the spinal cord.

ABSTRACTS

MARCOS CORREA

Wave Energy Converter Optimization

This project focuses on the hardware integration and system reliability improvements of a Wave Energy Converter (WEC) developed at Florida Atlantic University. Key objectives included implementing a main power switch for system safety and manually soldering electronic cables to ensure durable and secure electrical connections. The project also involved installing and waterproofing Inertial Measurement Units (IMUs) using epoxy within custom aluminum enclosures to monitor wing motion during wave energy harvesting. A leak detection system was developed using SOS Leak Sensors connected to the Jetson Nano's GPIO pins, alongside a Python-based program to log and alert leak events in real-time. Extensive voltage testing and troubleshooting were conducted to verify stable power delivery throughout the system. These hardware enhancements contribute to the WEC's operational reliability and establish a foundation for future deployments and sensor integrations in marine environments.

EMILY CUMMINGS

Phylogenetic Analysis of Gopher Tortoise Genes Associated with Hypoxia Resistance

Gopher tortoises are known for their ability to live in very deep burrows, where the conditions are typically hypoxic and hypercarbic. Little is known about the genetically encoded mechanisms that enable the gopher tortoise to withstand these conditions. To address this question, DNA was isolated from gopher tortoise blood, sequenced with ultra-long read nanopore sequencing, assembled, and annotated. We then performed phylogenetic analysis of the Hypoxia-inducible factor 1 (HIF-1) transcription factor gene sequences between the gopher tortoise and other burrowing or non-burrowing reptiles. These findings are of interest because they can show whether the HIF-1 transcription factor shows distinct sequences between burrowing and non-burrowing reptiles. The findings in this paper will aid in preserving the threatened gopher tortoise by broadening the minimal genomics knowledge surrounding the species.

NAHILA DAVIS**Glia regulate motor circuit excitability through cell subtype domain and spatial-specific manner**

Glia support is crucial to the nervous system due to roles in extracellular ion buffering. An example is astrocytic roles in potassium spatial buffering around synapses. However, this glial-centric mechanism of spatial buffering is not clearly described in other glial subtypes. Single-cell mRNAseq data has described the need to characterize the presence of two unique inwardly rectifying potassium channels (*Irk2/Irk3*) in the glial cells of the CNS. Additionally, *Drosophila melanogaster* provides a genetically tractable model to describe these roles while also possessing the homologous glial subtypes allowing the use of the escape circuit as an anatomical model. Here, we describe the region-specific domains that each glial subtype covers around our circuit. Our data shows that astrocyte-like glia (ALGs), ensheathing glia (EGs), and other subtypes utilize a specific profile of these potassium channels, possibly to perform compensatory roles. This study, paired with extensive electrophysiological experiments, describes how glial subtypes regulate overall circuit-level excitability.

AUSTIN GEORGE

Age-Dependent Neural Decline in Audition in a Mouse Model of Alzheimer's Disease

Animal models allow researchers to examine how neurodegenerative disease progression affects brain function and behavior. Transgenic Alzheimer's disease (AD) mouse models are especially useful because they reproduce key aspects of the disorder, including age-dependent neural decline. In prepulse inhibition (PPI), used to assess sensorimotor gating and auditory function across species, a weak auditory stimulus presented shortly before a louder startle stimulus reduces the magnitude of the startle response. Changes in response can reflect deficits in auditory processing and have been used to identify hearing loss in animal models [1]. PPI was used to examine in 3xTg model to determine whether auditory processing differed with age; differences were also examined. Studies suggest disruptions in nicotinamide adenine dinucleotide (NAD) levels contribute to neuronal dysfunction in AD [2]. Continued analyses focuses on measuring NAD levels across age groups to explore relationships between metabolic changes and auditory deficits.

LYAN DARBOYS GUERRERO

Exploring the Role of Pioneer Transcription Factors in HIV Transcriptional Regulation

Antiretroviral therapy prevents new HIV infections but cannot eliminate integrated proviral DNA that persists in long-lived CD4+ T cells, allowing low-level viral transcription during treatment. This persistence is shaped by host chromatin mechanisms that regulate access to the proviral genome. Pioneer transcription factors bind DNA within condensed chromatin, displace nucleosomes, and create permissive environments for gene modulation, making them strong candidates for controlling HIV expression. We constructed and screened a short hairpin RNA library targeting 24 candidate pioneer factors in an HIV-infected CD4+ T-cell model to assess their impact on HIV expression. The screen identified three regulators (EBF1, NF-YA/B/C complex, and POU5F1) whose depletion significantly increased HIV expression, measured by flow cytometry and viral transcript analyses. These effects were validated across multiple cell models. Mechanistically, EBF1 interacted with the viral transactivator Tat through domains required for transcriptional activation, linking a host pioneer factor to the machinery that amplifies HIV transcription.

SAVANNAH DEUTSCH

Patterns Of Predation: Examining Trends of Sea Turtle Egg Predators and Their Effects on Hatchling Success

Sea turtle egg predation by native and invasive species plays a significant role in sea turtle abundance and genetic diversity. Patterns of egg predation have previously been studied; however, shifts in predator composition over time and quantified levels of predator impacts through direct take and the reduction of hatchling success remain unclear. This honors thesis analyzes the type and abundance of sea turtle egg predators in South Florida and determines which predators are most impactful to sea turtle nests. All predation events from 2007–2024 were recorded on a 9.5-mile stretch of beach in South Florida. Preliminary results show a significant shift in primary predator type from raccoons to canids in 2015. Raccoons and canids are also hypothesized to result in the greatest reduction in hatchling success. This implies a shift in targeted mitigation techniques from raccoon to canid predation would benefit the continued restoration efforts of sea turtle populations.

ASHWIN DHAR

Quantifying Lateralized pERK Activation in the Insular Cortex Following Conditioned Taste Aversion

The insular cortex (IC) integrates sensory and emotional information and plays a critical role in taste processing and aversive learning. One well-established paradigm that engages the IC is Conditioned Taste Aversion (CTA), in which animals learn to associate a particular taste with an unpleasant experience. While the involvement of the IC in CTA is well established, far less is known about the functional lateralization of this structure and specifically whether the left and right insula contribute differently to aversive taste memory formation. This project investigates hemispheric differences in IC engagement during CTA using pERK immunohistochemistry as a marker of neuronal activation. By comparing pERK expression between the left and right insular cortex, this project aims to identify potential lateralized patterns of activation associated with aversive learning. Thus, this project provides insight into the organizational principles of the insula and of how aversive taste memories are encoded at the cortical level.

SOPHIA FERREIRA

Infant Salivary Cortisol and Internalizing Behaviors

Our study aims to (1) explore the relationship between maternal and infant cortisol levels, and (2) examine the association between infant cortisol and stress regulation during development. We hypothesize that higher maternal cortisol will be associated with elevated infant cortisol, which relates to greater difficulty managing stress. This research is part of a NIMH-funded project examining infant temperament, responses to novelty, and mother-infant interactions. For this study, we collected saliva samples from mothers and infants three times daily over three days, administered a stress inventory to mothers and examined the associations between infant cortisol and behavioral indicators of stress regulation. Infants are between 8- and 24-months old, a developmental window when reactivity to novelty increases and influences infant and maternal stress. Early stress exposure can disrupt emotional development and neuroendocrine function. Identifying how maternal stress can shape infant stress physiology, we endeavor to inform interventions that support adaptive outcomes.

GABRIELLA FUNDERLICH

Chromosome Number and Structure of the Gopher Tortoise

Gopher tortoises are a protected keystone species found throughout Florida, and their numbers are declining due to disease, habitat loss, and urbanization. Currently, there is no known sequenced genome, which limits conservation strategies that depend on population genetics. Surprisingly, there is limited knowledge about even basic information such as chromosome number and structure: two previous and very dated studies provide conflicting information. Using high molecular weight DNA and ultra-long read nanopore sequencing, we will assemble the entire genome. Aiming to confirm the number and structure of chromosomes, we can aid the conservationists by providing a way to understand the species and their progeny. Understanding where they came from and their evolutionary history could tell us what we can do today to give them the best chance of survival.

AIDEN GELETA

Perineuronal Nets Influence C1q Bioavailability

Perineuronal nets (PNNs), a specialized extracellular matrix, ensheathes mainly parvalbumin-expressing interneurons and play a crucial role in regulating neuronal function and plasticity. Disruption of PNNs has been linked to neuropsychiatric and neurodegenerative disorders. Despite these protective functions, the molecular mechanisms by which PNNs safeguard synapses remain unknown. Our lab identified an unexpected accumulation of complement protein C1q, known to trigger synapse elimination, in PNNs across hippocampal layers. To probe PNNs' role in anchoring C1q, I performed stereotactic surgeries injecting chondroitinase ABC into the mouse brain to enzymatically degrade CSPGs and PNN integrity *in vivo*. I found that C1q accumulation decreased dramatically. Based on these findings, we propose that C1q is sequestered in the ECM and released in response to appropriate signaling. Combining C1q knockout mice and PNN degradation, we will determine how sequestration of C1q by ECM protects synapses from microglia phagocytosis by preventing complement cascade activation and neuroinflammation.

AMARI GELIN

The Effects of Resiliency, Perceived Social Support, and Media Exposure on Mental Health in a Latino Population

Resiliency, social support, and media exposure are important factors to consider when assessing potential outcomes for patients with psychopathological disorders. Current research, among largely Caucasian samples, provides evidence that resilience and social support are negatively correlated to psychopathology severity. There is limited research systematically examining both of these variables, along with media exposure, in Hispanic samples. This study aims to investigate a Hispanic sample and the effect of resiliency, perceived social support, and media exposure as mediators against psychopathology. Through our study, we were able to find in a Hispanic sample that men had more exposure to antisocial media while women had more exposure to traumatic media, as defined by the Content-Based Media Exposure Scale (C-ME). We also found that both resiliency and social support were strongly negatively correlated with all psychopathology measures. In particular, the family subscale of social support showed the strongest negative correlation.

SABRINA GUARDINO

Threat Probability Overestimation Following Interpersonal Trauma

Following traumatic experiences, people may develop cognitive biases that influence how they interpret and anticipate events. This can lead them to overestimate the likelihood of a future negative event occurring. Though past research has explored this cognitive bias among individuals with posttraumatic stress disorder, less is known about the impact of trauma type. The current study administered questionnaires to 452 participants to assess their traumatic experiences, along with the Probability and Cost Questionnaire (PCQ) to assess biased estimates of future negative life events. Participants with interpersonal trauma scored significantly higher than those with accidental trauma and those without trauma, on both interpersonal and accidental PCQ subscales. Participants with accidental trauma did not significantly differ from those without trauma. These results suggest that interpersonal trauma can lead to cognitive biases that cause victims to overestimate the likelihood of a negative event occurring in the future, especially events involving interpersonal violence.

HOLLIS HODGES

Heterozygosity in the Gopher Tortoise Genome

As wildlife populations continue to decline, understanding the genetic health of threatened species has become increasingly important for effective conservation. The gopher tortoise (*Gopherus polyphemus*), a keystone species of the southeastern United States, has experienced significant population declines, yet fundamental knowledge of its genome remains poorly understood. The current genetic research on this species is limited and primarily focuses on population structure, reproduction, and immune-related genes. Studies of other *Gopherus* species show that genomic heterozygosity plays a critical role in understanding population resilience and assisting conservation efforts. However, the level of heterozygosity within the gopher tortoise genome has not been studied. To address this gap, ultra-high-molecular-weight DNA will be collected from blood samples and used to assemble a de novo genome. This research aims to quantify genome-wide heterozygosity, providing foundational genetic information to assist conservation efforts and support the long-term persistence of this keystone species.

ABSTRACTS

TERESA HUANG

Investigating the Role of the Nicotine Acetylcholine Receptor Subunits in an Amphetamine Induced Behavior in *Caenorhabditis elegans*

Amphetamine (Amph) is a psychostimulant that increases extracellular dopamine by interacting with specific proteins expressed in the dopaminergic neurons. Previous studies showed that activation of the nicotine acetylcholine receptors (nAChR) increases dopamine release. nAChRs are channels made of 5 subunits and, because multiple nAChR subunits exist, each set of 5 subunits results in a unique channel with specific properties and tissue location. Using *Caenorhabditis elegans*, our laboratory has discovered that animals lacking LEV-1, a homolog of the human α nAChR subunits, exhibit abnormal Amph-induced behaviors. This project aims to investigate the role played by the nAChR subunits, ACR-2 and ACR-3, in the abnormal behavioral response to Amph. We have created *lev-1;acr-3* double mutants and performed behavior essays to test if genetic ablation of *acr-3* rescues the abnormal Amph-induced behavior seen in *lev-1* mutants. Preliminary data shows that the *lev-1;acr-3* mutants respond to Amph as the single *lev-1* mutants do.

NOAH HUDGENS-MOORE

Impact of Glitches on the Way We View Video Games

The presence of glitches in video games complicates our understanding of the medium as an art form by disrupting the experience they provide to an audience. The nature of this disruption varies: it may occur mechanically, impacting the rules the players engage with, or it may manifest more so in the representational characteristics of the game (audiovisual elements). Glitches are not unique to video games, but the interactive nature of the medium means that corruptions one might feel inclined to try and ignore are engaged with more directly than in, say, a movie. Glitches may impact the way we interpret the fiction of a work or even allow players to approach the work in an entirely different way than designers intended, as with many speedruns.

RISHA HULLOLI

Segmentation of Owl Pellets from Micro CT scans for an Educational Model

Three-dimensional (3D) digital models are increasingly used in science education to improve interactive learning across biological disciplines. In our project we implement this to create free and accessible 3D models of owl pellets to be shared for educational use focused on analyzing the owl's diet and anatomy of their prey. We used previously collected micro-CT scans of owl pellets and created the 3D models (segmentations) using SlicerMorph, an extension of the 3D Slicer software. To create the segmentations, we selected individual skeletal elements (five bone types, with 2-3 replicates each) using grayscale thresholding by density, and manual painting and erasing tools. These owl pellet models provide detailed representations that preserve specimen integrity while promoting educational use. This work demonstrates how microCT-based modeling can expand accessible, non-intrusive tools for biology education. We hope our anatomical specimens can be used for further research on skeletal morphology and predator-prey relationships.

ALEXANDRA ILCHENKO

Comparing Registration Approaches for Whole-Brain Probe Localization and Neuronal Morphology

Precise quantification of neuronal morphology and electrophysiological recording sites within a standardized brain atlas is essential in neuroscience. However, conventional histological reconstruction methods are slow, labor-intensive, and introduce geometric distortion that limits spatial precision and reproducibility. Here, we develop a light-sheet microscopy-based workflow for rapid, whole-brain imaging and image processing of the mouse brain. Using tissue clearing and volumetric imaging on the Zeiss Lightsheet 7, combined with automated registration to the Allen Brain Atlas, this pipeline enables three-dimensional reconstruction of electrophysiological probe tracks within hours rather than weeks. We benchmark two complementary registration approaches, BigWarp and Arivis Vision4D, evaluating accuracy, runtime, and inter-user variability to establish best-practice parameters for reliable atlas alignment. We also apply the optimized workflow to reconstruct layer 5 cortical neurons in *Rorb* haploinsufficient mice to determine neuronal morphological differences associated with autism-linked genetic variation. Together, these results establish a high-throughput framework for whole-brain imaging and quantification.

CHARAN JARUGULA

Investigation of *Drosophila* Sleep Homeostasis in Social Environment

Sleep is a conserved biological process regulated by homeostatic mechanisms that compensate for prior sleep loss. In *Drosophila melanogaster*, social experience has been shown to alter sleep and activity, yet the real-time effects of social environment on sleep homeostasis remain poorly understood. This study investigates sleep recovery following sleep deprivation and whether it differs between social isolation and enrichment. We quantify sleep behavior in social environments using our newly developed long-term, identity-preserving tracking system. We propose that the social environment influences sleep baseline and stress release, providing a novel explanation for post-social phenotypes. These findings aim to elucidate the true impact of the social environment on the sleep patterns of flies.

LENS JEANNOT

Gopher Tortoise Burrow Soil Sample Collection Mechanism with Visuals

Gopher tortoises (*Gopherus polyphemus*) are a threatened keystone species whose burrows provide shelter and protection to over 350 species. Collecting environmental DNA from the terminal chamber could help researchers better understand the burrow ecosystem where tortoises spend much of their time. Researchers have struggled to visualize and collect soil samples further than six to ten feet deep, due to burrow turns and roots. Therefore, the focus is on obtaining visual footage of the interior of the base of the burrows and developing a suitable sampling mechanism for collecting the samples. The experiment will assess the camera and collection mechanism's ability to maneuver around corners and over branches, capture clear footage, and collect sterile samples. This experiment will enable future researchers to have better insight into the organisms that utilize the burrow.

SAMY JEANNOT

MHC Class II DRB exon 2 regions of Gopher Tortoise

Upper respiratory tract disease (URTD) harms gopher tortoise health, and prior work suggests that variation in MHC alleles may influence disease susceptibility. However, MHC class II DRB genetics in the gopher tortoise (*Gopherus polyphemus*) remain poorly resolved because prior surveys relied on short PCR fragments of exon 2. We will use Oxford Nanopore ultra-long-read sequencing of high-molecular-weight genomic DNA from an adult tortoise to generate and polish a draft genome assembly. Using this assembly, we will locate and annotate DRB-like loci, define exon-intron boundaries and open reading frames, and estimate DRB locus copy number while distinguishing putatively functional genes from paralogs and pseudogenes. This genomic framework will support future population-level sequencing and association studies linking DRB variation to URTD susceptibility and conservation management.

MIRIAM KAMEL

Diurnal Salivary Cortisol in Toddlers 10 to 18 Months in Age

Maternal biological and psychological patterns have been shown to affect infants throughout development. Cortisol, a hormone created in the hypothalamic-pituitary-adrenal (HPA) axis, plays an essential role in the human stress response system. This project explores the relationship between maternal stress and diurnal salivary cortisol levels – a measure of cortisol levels throughout the day – and the diurnal cortisol levels of their 10-to-18-month-old infants. Mothers in the study collected saliva samples three times a day for three days, from both themselves and their toddler, which are analyzed through enzyme-linked immunosorbent assays (ELISA). Assay results are analyzed against each other and against the mother's results in the Perceived Stress Scale (PSS) questionnaire, which are used to assess maternal stress levels. A positive relationship between maternal stress and both infant and maternal diurnal cortisol is expected. Results of this study hope to illustrate the deeper biological and psychological effects of infant-mother dyadic synchrony.

ABSTRACTS

EDWARD KING

Bone Morphogenetic Protein regions in the genome of *Gopherus polyphemus*

The gopher tortoise (*Gopherus polyphemus*) is a keystone species native to the American southeast, whose potential decline threatens hundreds of other species. Despite its ecological importance, currently there is no known genome sequence for the gopher tortoise as current research primarily emphasizes population genetics and immune genes. This research aims to sequence bone morphogenetic protein (BMP) regions in the gopher tortoise genome through nanopore sequencing of ultra-high molecular weight DNA, genome assembly, and annotation. BMP genes play a central role in skeletal and shell development and may play a role in the burrowing morphology of the gopher tortoise. By performing phylogenetic analysis of these genomic regions, this research provides a foundation for future investigation and offers insight into how specific genetic regions vary between burrowing and non-burrowing organisms.

ANDREW KOSCHO

Studying Immune System Genes in *Gopherus polyphemus*

Gopher tortoises are keystone species across the Southeastern US, yet disease and habitat loss threaten their recovery. We know populations show an east-west genetic split, and that immune genes in related tortoises vary, suggesting defenses may differ among tortoise populations. However, the genetics of the gopher tortoise's immune system are largely unknown. Our study sets to utilize ultra-long read nanopore sequencing to obtain the *Gopherus polyphemus*' genome and search for its key immune genes from related tortoises using comparative genomics. Hopefully, with this information, we will be able to identify the immune pathways of the *Gopherus polyphemus* population in southern Florida, specifically of the Abacoa Greenway. With a new understanding of the gopher tortoise and its genome, this study could also provide foundational work that could lead to future research correlating immune alleles with disease resistance.

VISAK KUMAR

Development of a High-Fidelity Cell-Based Screening Platform for Orphan Nuclear Receptors via PiggyBac Transposon System

Orphan nuclear receptors regulate gene expression programs involved in metabolism and inflammation, making them promising targets for therapeutics. However, many remain poorly characterized due to a lack of robust screening tools. To address this limitation, this project aims to develop a high-fidelity, cell-based screening platform for orphan nuclear receptors to enable the discovery of selective modulators and improve the understanding of their ligand-dependent biology. We utilized PiggyBac transposon vectors to generate stable HEK293T reporter cell lines containing receptor constructs, response-element-driven firefly luciferase, and NanoLuc internal controls. Cells were transfected, antibiotic-selected, single-cell sorted, and validated by fluorescence imaging, immunoblotting, and dual-luciferase assays. The resulting platform results in reproducible, quantitative measurements of receptor transcriptional activity and a suitable assay dynamic range for compound screening. This system provides a scalable, non-viral method for generating reporter lines and will support high-throughput ligand discovery and downstream mechanistic studies of orphan nuclear receptor signaling.

BRIANNA LETTERIO

Retail Trading in the Digital Age: Social Influence, Platform Design, and Market Volatility

The rise of mobile trading platforms and social media investing communities has transformed retail investor behavior, particularly among individuals aged eighteen to twenty-five. This study examines how platform design and online social influence encourage risk-taking and herd behavior, contributing to short-term market volatility in speculative assets such as GameStop. Drawing on insights from behavioral finance, market microstructure, and social-media analysis, the paper explores trading frequency, holding periods, and attention-driven trading patterns during periods of heightened retail participation. Evidence from regulatory reports, market data, and online investor discourse suggests that young retail investors adopt faster and riskier trading strategies than older cohorts, amplified by gamified interfaces and collective online narratives. The findings highlight the interaction between technology, demographics, and social influence in shaping modern retail trading dynamics and raise important implications for investor protection, platform governance, and market stability.

DYLAN LIPSET

cGAS-STING Pathway Involvement in Traumatic Brain Injury Induced Inflammation

Traumatic brain injury (TBI) induces lung damage via inflammatory signaling. The cGAS-STING pathway triggers a cascade of inflammatory cytokines and damage associated molecular pattern proteins (DAMPs) upon detecting DNA from damaged/dying cells. Nicotinamide phosphoribosyltransferase (NAMPT), a DAMP released from cells/tissues (eNAMPT), has been demonstrated to activate TLR4. We hypothesize that STING-mediated eNAMPT release may be involved in TBI-induced lung injury. We will determine the effects of eNAMPT inhibition on cGAS-STING activation using ALT-100. TBI mice will undergo controlled cortical impact surgery and be treated with either a vehicle or ALT-100. Western blots were performed to detect cGAS-STING proteins, cytokines, and DAMPs including eNAMPT. Statistical analysis (D'Agostino-Pearson, t-test, one way ANOVA) will be conducted to compare cytokines/biomarkers to a housekeeping protein. We expect a decrease in cGAS-STING activation and reduced secretion of STING proteins in the ALT-100-treated TBI mice suggesting neutralization of eNAMPT may reduce cGAS-STING dependent inflammation.

RYANN MARTIN

The Effects of Microbiota on Juvenile Gopher Tortoise Survival

The gopher tortoise is a keystone species, meaning that they play a vital role in the maintenance of the ecosystem. They maintain the ecosystem through counterbalancing acts of grazing and seed dispersal and the creation of shelters for hundreds of other species through burrowing. Such an important species has been placed under the status of threatened. While all gopher tortoises are at risk, the greatest mortality is seen among juveniles. Due to a lack of research, differences between the microbiota of adult and juvenile gopher tortoises are unknown. Through the sequencing of the fecal samples, differences between the two may be found and could lead to the development of theories as to why this discrepancy may exist aside from the difference in life experience. We hope to find differences in the microbiomes that can be linked to increased fitness in the adult gopher tortoises that are not present in juveniles, leading to increased mortality.

MADISON MCADOO

Gopher Tortoise Burrow Soil Sample Collection Mechanism with Visuals

Gopher tortoises (*Gopherus polyphemus*) are a threatened keystone species whose burrows provide shelter and protection to over 350 species. Collecting environmental DNA from the terminal chamber could help researchers better understand the burrow ecosystem where tortoises spend much of their time. Researchers have struggled to visualize and collect soil samples further than six to ten feet deep, due to burrow turns and roots. Therefore, the focus is on obtaining visual footage of the interior of the base of the burrows and developing a suitable sampling mechanism for collecting the samples. The experiment will assess the camera and collection mechanism's ability to maneuver around corners and over branches, capture clear footage, and collect sterile samples. This experiment will enable future researchers to have better insight into the organisms that utilize the burrow.

EMILY MCCURDY

The Neurobiology of Motivation to Engage in Physical Exercise

Despite the known benefits of physical activity, exercise motivation remains a barrier to health. While psychological factors are well-documented and studied, the underlying neurobiological mechanisms are less understood. This review thesis synthesizes evidence from 50 studies to clarify how brain circuits and neurotransmitter systems regulate the motivation to move. The findings highlight the mesocortical and mesolimbic dopaminergic pathways, particularly those originating in the ventral tegmental area, as central to voluntary exercise and reinforcement. Additionally, this review explores how varied reward-processing systems influence long-term adherence versus sedentary behavior. By integrating these neural mechanisms into a narrative synthesis, this research provides a neurobiological framework for understanding exercise motivation. These insights are needed for developing interventions that move past behavioral strategies, offering a physiological basis for enhancing long-term exercise adherence and public health outcomes.

CAMILA MILLAN

A Psychobiographical Study of Horacio Quiroga: Suicide as a Protagonist

Horacio Quiroga is an Uruguayan writer who became widely known for his short stories in which death is inevitable since his characters seem to die tragically either through suicide, illness, or natural causes. His life has also fascinated many literary critics because of the many tragic deaths he experienced, leading them to notice parallels between his life and his work. However, critics disagree on how to interpret this relationship. Some argue that assuming his works mirror his life is reductionist, while others claim that the parallels are enough to justify said interpretation. A psychobiographical approach to Quiroga's life that uses Roy Baumeister's theory of suicide as an escape from self and Thomas Joiner's interpersonal theory of suicide, allows for an analysis of the psychological and behavioral patterns of both the author and his characters. This illustrates how his life and stories reflect recurring themes of death and hopelessness.

RYLEIGH NEWMAN

Uncovering a Novel Neuromuscular Disorder

A three-generation family affected by a progressive hereditary neuropathy resembling Charcot-Marie-Tooth (CMT) disease presents a compelling case study of unresolved genetic etiology. Affected individuals exhibit hallmark features of hereditary motor and sensory neuropathy, including distal limb atrophy, progressive muscle weakness, and sensory involvement. However, despite more than twenty-five years of clinical evaluation and comprehensive genetic testing, no causative variant has been identified, suggesting a disease mechanism beyond the scope of current diagnostic panels. This study integrates detailed clinical phenotyping with whole genome sequencing data from five participants in the family, including three affected and two unaffected individuals. Through systematic computational filtering based on allele frequency and inheritance patterns, targeted with phenotype prediction, candidate variants were progressively refined to identify the most plausible pathogenic drivers. Together, this case-based genomic approach establishes a transparent and replicable framework for investigating genetically unresolved neuromuscular disorders and advancing rare disease discovery through scalable genomic methodologies.

SHANE PATEL

Comparison Between Plant Diversity and Microbes Within the Gopher Tortoise Diet and Gut

Gopher tortoises are keystone species that support hundreds of vertebrates and are vital to their environments. The gopher tortoise has been listed under the Endangered Species Act as a threatened species in states such as Louisiana, Mississippi, and Alabama. Over the last century, the gopher tortoise population has decreased due to human-related environmental destruction. Research involving the gopher tortoise microbiome or diet is limited and has not been studied to the necessary degree. A study was completed to investigate whether there are significant differences in plant diversity within the gopher tortoise diet between juvenile and adult tortoises. The significance of the thesis is to aid in the development of conservation strategies for juvenile and adult gopher tortoises and to demonstrate that plants and microbes are prominent components in terms of survival as a species.

MEGAN PINSKER

Comparing Density and Distribution of the Invasive Peanut Snail (*Cerion tridentatum costellatum*) Across 3 Sites in Southeast Florida

Cerion tridentatum costellatum is a hybrid land snail that occurs in dune vegetation in Southeast Florida. The species has well-established populations in Palm Beach County from Delray Beach (26.44N) to Ocean Ridge (26.54N). An additional population was recently discovered in Fort Pierce, St. Lucie County (27.46N). I used iNaturalist to document snail distribution and employed a belt-width transect methodology to compare snail density across three sites: Delray Beach, Boynton Beach, and Fort Pierce. With this data, I hope to help the scientific community better understand how peanut snail abundance differs between the three populations and is affected by dune foliage cover

PANTEHA SARTIPI**Glia Regulates Motor Circuit Excitability to Shape Circuit Performance**

Homeostasis of ions is regulated, in part, by glial cells through inwardly rectifying potassium (Kir/Irk) channels that buffer extracellular potassium. During periods of heightened neuronal firing, extracellular potassium levels rise, and it is currently unclear how potassium buildup may lead to neuronal hyperexcitability and importantly circuit-level dysfunction. The *Drosophila melanogaster* giant fiber escape circuit provides a reliable system to reveal spatial buffering regulatory roles in motor circuit performance. Glial subtype-specific genetic perturbations of *Irk2* and *Irk3* using *in vivo* electrophysiology reveal that astrocyte-like glia (ALGs), ensheathing glia (EGs), and additional glia subtypes require both channels to properly regulate circuit excitability. Our investigation reveals glial subtype-specific roles in limiting a biologically feasible change in potassium equilibrium potential, thereby impairing motor circuit performance.

ANISH SATHISH**Dendritic Morphology in Mice with Defective Cleavage of Neuroligin-1: A Synaptic Adhesion Protein Implicated in Autism Spectrum Disorder**

Autism Spectrum Disorders (ASDs) encompass a range of neuropsychiatric conditions that vary in severity and are marked by challenges in social interaction, delayed or absent language development, and recurring, limited behavior patterns. This thesis will focus on the SD3 mouse model of ASD, where cleavage of Neuroligin-1 isoform (NLGN I) is prevented from occurring as normal. NLGNs are synaptic adhesion molecules, which contribute to the formation and function of synapses. They facilitate the recruitment of molecular components, support synaptic maturation, and play a crucial role in generating and transmitting electrical signals. The evaluation dendritic neuron length, surface areas, and overall complexity revealed no differences between the wild type controls and the SD3 variant. However, SD3 mice exhibited a reduction in dendritic neuron volume, potentially indicating diminished synaptic transmission and weakened neuronal signal amplitude.

DANIEL SCHER

MnO₂ Hollow Nanoparticles Modulate Amyloid-Beta Aggregation Pathways in Alzheimer's Disease

Amyloid-beta (A β) aggregation into toxic polymers is an indicator of Alzheimer's disease (AD). This project investigates whether previously unexplored engineered manganese dioxide (MnO₂) hollow nanoparticles can modulate A β 40 and A β 42 aggregation pathways. Nanoparticles were synthesized through a redox method and characterized using transmission electron microscopy, dynamic light scattering, and Fourier-transform infrared spectroscopy. Peptides were incubated with and without nanoparticles to assess changes in aggregation kinetics and structural morphology. MnO₂ nanoparticles reduced total fibril formation while increasing the time it took for aggregation to start, altered aggregate structure towards less toxicity compared to untreated controls, and reduced harmful oligomerization byproducts. These findings demonstrate that nanoparticles can function as tunable platforms for influencing protein. If proven safe and efficient, the nanoparticle platform can serve as both a delivery method and part of a treatment for not only Alzheimer's Disease, but adjacent neurological conditions.

MALLORY SCHUMAKER

Swimming Kinematics of Sedentary and Migratory Sharks

This study compared the swimming kinematics of three co-occurring shark species that differ in morphology and migratory behavior. I analyzed aerial drone footage of blacktip (*Carcharhinus limbatus*), lemon (*Negaprion brevirostris*), and nurse sharks (*Ginglymostoma cirratum*), free swimming in their natural habitat, to quantify tailbeat frequency (Hertz), tailbeat amplitude (body length), and velocity (body lengths per second). I found that the tailbeat frequency differed significantly among the three shark species. The blacktip exhibited the greatest tailbeat frequency (1.04 Hz), the nurse had the lowest (0.62 Hz) and the lemon was intermediate (0.74). Other values are forthcoming. This study is the first comparative analysis of swimming kinematics among different shark species. These results may provide a mechanism to correlate swimming kinematics with migratory patterns that can be used to predict the extent of migration exhibited by a given species, including species for which studying long distance migration is particularly difficult.

KEITH SCOTT**FlyAPI: A Method of Aligning Behavior to Genetics using a High-Throughput Test Chamber**

Behavioral assays are essential for linking genetic and physiological state to stimulus-evoked escape behavior, necessitating a high-speed, precise, and synchronized method for recording responses in *Drosophila melanogaster* under repeatable conditions. We present an integrated system comprising the FlyPy software interface and a custom test chamber that together coordinate dual cameras, a stimulus display, and auxiliary lighting within an isolated environment. Trials are initiated by a laser tripwire (beam-break sensor) that triggers simultaneous recording from both cameras, followed by user-parameterized control of stimulus timing, recording duration, and lighting conditions, while automatically generating standardized video output and trial logs containing timestamps and metadata. These synchronized data support downstream extraction of response latency and kinematic measures across experimental, genetic, and aging or disease conditions. Initial validation data demonstrate that the selected parameters reliably elicit fast escape responses and enable accurate quantification of mutant phenotypes relative to controls.

MICHAEL STOUFFER**A Literature Review on Lev Vygotsky's Cognitive Development of Higher Mental Functions as Applied to Autism Spectrum Disorder**

Lev Vygotsky's cultural-historical theory frames one's cognitive development of higher mental functions as mediated by cultural tools: language, symbols, and signs, whereby cognition is socially molded and historically situated. This thesis examines Vygotsky's theory about the role of language and visual imagery in the development of higher cognitive tasks, asking how this theory may apply to autistic individuals. Autism Spectrum Disorder (ASD) is a neurodevelopmental condition characterized by variations in social communication, sensory processing, and patterns of behavior. It is the hope of this thesis to see if Vygotsky's theory adequately explains how cognitive development occurs, given the variations in social experiences of autistic individuals.

MAHIMA SURESH

Cell-Type-Specific IL-1R1 Signaling and Its Contribution to Alzheimer's Disease Pathology

Alzheimer's disease (AD) is a neurodegenerative disorder that progressively impairs memory, behavior, and cognitive function. Hallmarks of AD include the deposition of neurofibrillary tangles by misfolded tau proteins and the formation of amyloid-beta (A β) plaques generated through amyloidogenesis. IL-1 receptor type 1 (IL-1R1) is a central regulator in the inflammatory process; however, the role of astrocytic IL-1R1 in Alzheimer's disease remains unclear. This project investigated cell type-specific IL-1R1 in the 5xFAD mouse model of AD by quantifying its expression in hippocampal regions with the presence of A β plaques. Using cryosectioned brain tissue, immunohistochemical labeling, and confocal microscopy, astrocytic IL-1R1 expression was quantitatively analyzed using Ilastik and ImageJ. We expect to find that increased astrocytic IL-1R1 is associated with elevated plaque deposition and chronic neuroinflammatory signaling. These results could indicate that astrocytic IL-1R1 specifically mediates sustained neuroinflammation and modulating its activity could protect cognitive health.

KAROLINA THOMAS

Beyond the Genes: Intronic Enhancer Proxies in *Gopherus polyphemus*

Gene regulation plays a significant role in how organisms respond to environmental stress, disease, and evolutionary pressures. Previous studies suggest that enhancer regions are often located within introns, and longer introns and more conserved sequences may indicate greater regulatory complexity. However, the regulatory architecture of the gopher tortoise (*Gopherus polyphemus*) genome remains poorly understood. This study examines the characteristics of introns, specifically the presence of conserved sequences (enhancer proxies), to elucidate differences between the tortoise's housekeeping and immune genes. The gopher tortoise's genome was sequenced, annotated, and analyzed to quantify intron length and conserved sequence features, with statistical comparisons used to assess intronic architecture across gene categories. This research is expected to show that immune genes exhibit greater intronic complexity, suggesting that immune pathways in this species rely on more elaborate regulatory mechanisms. Hopefully, these results will aid conservation efforts to protect this threatened keystone species effectively.



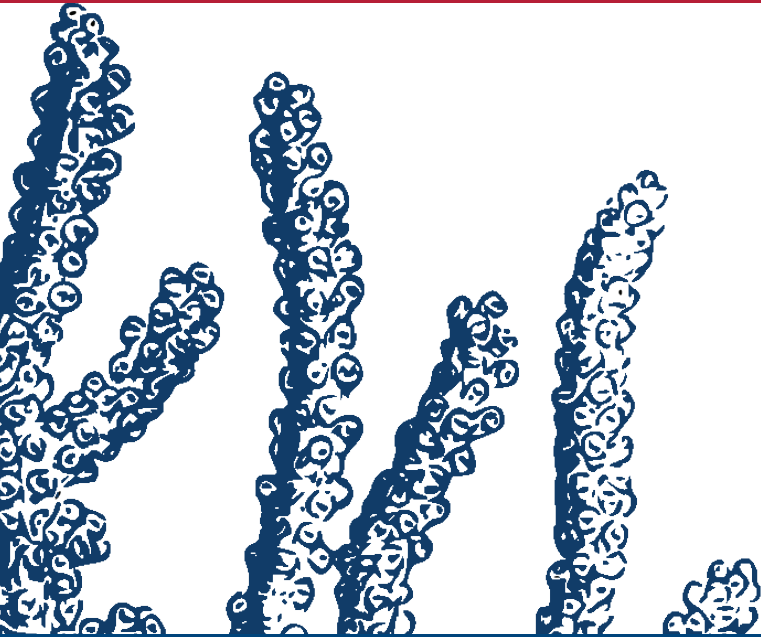
ABSTRACTS

ABSTRACTS ALPHABETICAL BY STUDENT'S LAST NAME



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