

# 21<sup>ST</sup> ANNUAL

SCHOLARLY *E* CREATIVE  
research  
SYMPOSIUM

**Friday March 31<sup>st</sup>**

FAU, John D. MacArthur Campus

**Chastain Lecture 2023**  
“Holding Lightning in a Bottle:  
The Critical Reception of Richard Wright's  
*Native Son.*”

MEET THE SPEAKER

**TRUDIER HARRIS, PH.D.**



University Distinguished Research Professor  
Emerita, English, University of Alabama

J. Carlyle Sitterson Distinguished Professor  
of English Emerita, University of North  
Carolina at Chapel Hill

**21<sup>ST</sup> ANNUAL**  
SCHOLARLY *E* CREATIVE  
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**SYMPOSIUM COMMITTEE:**

Zachary Ferrara – chair

Dorotha Lemeh

Sondra Washington

Bharat Verma

Alex Coffman (ex officio)

**MESSAGE FROM THE DEAN JUSTIN PERRY**



Welcome to the 21<sup>st</sup> Annual 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

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The 2023 Robert Lee and Thomas M. Chastain  
 Honors Symposium Lecture Presents:  
**DR. TRUDIER HARRIS, PH.D.,**  
 Distinguished Research Professor Emerita, English,  
 University of Alabama and University of North  
 Carolina at Chapel Hill



Chastain Lecture 2023  
**“Holding Lightning  
 in a Bottle:  
 The Critical Reception of Richard Wright’s  
*Native Son.*”**

**EVENT SCHEDULE: MARCH 31, 2023**

8:30-9:00	Participant Registration	AD Building
9:15-10:15 AM	Session 1: Oral Presentations	AD Building
10:15-10:30	Break	
10:30-11:30 AM	Session 2: Oral Presentations	AD Building
11:30-1:00	Break	
1:00-2:00 PM	Chastain Lecture: Dr. Trudier Harris	AD 119
2:00-4:00 PM	Session 3: Visual Arts and Creative Research Research Poster	SR Building HC Building

## SESSION 1 AND 2: ORAL PRESENTATIONS SCHEDULE

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

## SESSION 1 AND 2: ORAL PRESENTATIONS SCHEDULE

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

### SESSION 1

	AD 103	AD 104	AD 202	AD 205	AD 206
9:00 AM	Jake Chavis	Jonathan Barroso	Nathaly Bayona	Sarah Diehl	Dawid DiGangi
9:15 AM	Nihatika Gopi	Shanece Coppin	Hailey Ezzell	Kasey Preisser	Ruben Garcia-Navarro
9:30 AM	Michelle Gras	Haven Gray	Bailey Palmer	Warren Yee	Irene Gatimi
9:45 AM	Karis Hong	Madelyn Macias	Helen Peluso	Camille Berardone	Maria Saavedra
10:00 AM	Kathryn Martin	Amanda Mulvaney	Micah Campbell et al	Julia Hensley	Taylor Vinciguerra

### SESSION 2

10:30 AM	Julia McDuffee	Annabelle Rosa	Angela Easterling	Ashley Bobnar	Steven Slaman
10:45 AM	Megan White	Renee Sealy	Mia Grazel	Meghan Keough	Sidnie Walker
11:00 AM		Allen Vo	Natasha Mayorga		John Walsh

## Session 1: Oral Presentations

9:00 AM

AD103

**JAKE CHAVIS****Advisor/Professor:** David BinningerThe Effect of Age on Post-Hypoxic Survival Rates of *Drosophila melanogaster*

AD104

**JONATHAN BARROSO****Advisor/Professor:** Mark Tunick

Proportional Punishment: Fair vs. Efficient

AD202

**NATHALY BAYONA****Advisor/Professor:** Rachel Luria

The Concept of Closure and its Use in Comics and Film

AD205

**SARAH DIEHL****Advisor/Professor:** Warren McGovern

Exploring Fractals: the Mandelbrot Set

AD206

**DAWID DIGANGI****Advisor/Professor:** Timothy J. Steigenga

A New Labor Movement: What Motivates Workers to Unionize and What Stands in Their Way?

9:15 AM

AD103

**NIHASIKA GOPI****Advisor/Professor:** Warren McGovern

Delineating the Intracellular and Extracellular role of MMP-14 in Primary and Metastatic Pancreatic Cancer

AD104

**SHANECE COPPIN****Advisor/Professor:** Mark Tunick

Guilty but Insane?: The Case of John Hinckley

AD202

**HAILEY EZZELL****Advisor/Professor:** Rachel Luria

Ghost Writers

AD205

**KASEY PREISSER****Advisor/Professor:** Warren McGovern

Origami Constructible Numbers and Solving the Problems of Antiquity

AD206

**RUBEN GARCIA-NAVARRO****Advisor/Professor:** Timothy J. Steigenga

The Frozen Straits: U.S.-Cuba Relations as a Multi-Level Game

## 9:30 AM

AD103

**MICHELLE GRAS****Advisor/Professor:** Shailaja Allani

Sulindac Enhances the Effect of Doxorubicin on Pancreatic Cancer Cells

AD104

**HAVEN GRAY****Advisor/Professor:** Mark Tunick

Guns and Times: Originalism and the United States Supreme Court Decision in New York State Rifle &amp; Pistol Association, Inc. v. Bruen, 597 U.S. \_\_\_\_ (2022)

AD202

**BAILEY PALMER****Advisor/Professor:** Dorothea Lemeh

The Viking Onore: Limits of Man

AD205

**WARREN YEE****Advisor/Professor:** Yaouen Fily

Computer Vision: A New Pair of Fresh Eyes to Study Animal Behavior

AD206

**IRENE GATIMI****Advisor/Professor:** Timothy Steigenga

Approaching China's Belt and Road Initiative's Debt-trap Diplomacy

## 9:45 AM

AD103

**KARIS HONG****Advisor/Professor:** Jennifer Krill

Effects of SARS-CoV-2 Gene Expression on Chemosensory Systems in Drosophila Melanogaster

AD104

**MADELYN MACIAS****Advisor/Professor:** Mark Tunick

The Psychology Behind Police Interrogations

AD202

**HELEN PELUSO****Advisor/Professor:** Julie Earles

"They are Just Like Me!": An Analysis of Accurate Mental Health Representation in Fiction and the Application of Psychological Research in Creative Writing

AD205

**CAMILLE BERARDONE****Advisor/Professor:** Andia Chaves-Fonnegra

Reproductive Success and Settlement of Brooding Sponges in the Florida Keys

AD206

**MARIA SAAVEDRA****Advisor/Professor:** Julie Earles

The Effects of Exercise on Anxiety A Correlational Study

## 10:00 AM

AD103

**KATHRYN MARTIN****Advisor/Professor:** Gregg B. Fields

A Study to Elucidate Matrix Metalloproteinase 14 Expression in Pancreatic Cancer Cell Lines Under Both Normoxic and Hypoxic Conditions

AD104

**AMANDA MULVANEY****Advisor/Professor:** Mark Tunick

The FBI's Raid of Trump's Mar-a-Lago and the Limits of Executive Privilege

AD202

**MICAH CAMPBELL****RENEE SEALY, SIDNIE WALKER, TRIP KEEFAUVER****Advisor/Professor:** Rachel Luria

Aging Communities: Celebrating the Aging Process in Art

AD205

**JULIA HENSLEY****Advisor/Professor:** Andia Chaves-Fonnegra

Potential Effect of Hurricanes on Sea Turtle Strandings in Central and Southeast Florida

AD206

**TAYLER VINCIGUERRA****Advisor/Professor:** Laura Vernon

Is ADHD Directly Related to Eventual Participation in Criminal Behavior?

## Session 2: Oral Presentations

## 10:30 AM

AD103

**JULIA MCDUFFEE****Advisor/Professor:** Jennifer Krill

Quantification of the 460L Abberior Dye's Response to STED

AD104

**ANNABELLE ROSA****Advisor/Professor:** Mark Tunick

The Ethics of Territories: The Unconstitutionality of Puerto Rico's Status as an Unincorporated Territory

AD202

**ANGELA EASTERLING****Advisor/Professor:** Nancy Jones

Facial Emotion Recognition in Children with Autism Spectrum Disorder

AD205

**ASHLEY BOBNAR****Advisor/Professor:** Andia Chaves-Fonnegra

Post-Settlement Developmental Timeline in Brooding Sponges

AD206

**STEVEN SLAMAN****Advisor/Professor:** Kanybek Nur-tegin

Effect of Homeowners Associations on Sold Price of Residential Properties in Palm Beach Gardens

## 10:45 AM

AD103

**MEGAN WHITE****Advisor/Professor:** Catherine Trivigno

Effects of Dienogest and Non-calcemic Analogs of Vitamin D on Endometriosis Cells In Vitro

AD104

**RENEE SEALY****Advisor/Professor:** Mark Tunick

Dignity is Inherent, but Respect is Earned: The American Criminal Justice System's Treatment of its Prisoners

AD202

**MIA GRAZEL****Advisor/Professor:** Monica Maldonado

An Exploration of User Interface and User Experience Through Psychology

AD205

**MEGHAN KEOUGH****Advisor/Professor:** Jon Moore

Testing and Retesting for Upper Respiratory Tract Disease (URTD) in a Population of Gopher Tortoises in South Florida

AD206

**SIDNIE WALKER****Advisor/Professor:** Ashley Kennedy

Are U.S. Medical Programs Successfully Addressing Racial Factors of Healthcare Equity?

## 11:00 AM

AD104

**ALLEN VO****Advisor/Professor:** Mark Tunick

The Internet's Echo Chambers and their Effect on Information Disorder, Hate Speech and Violent Radicalization

AD202

**NATASHA MAYORGA****Advisor/Professor:** Tricia Meredith

Exploring Nonmuscle Myosin II Subcellular Localization and Dynamics in Dendritic Spines

AD206

**JOHN WALSH****Advisor/Professor:** Warren McGovern

Determining Incident Likelihood in Football Stadiums using Apriori Association Rules Mining



## Session 3: Visual Arts and Creative Research

SR BUILDING, ROOM 149

**2:00 - 4:00 P.M.**

### ARTHUR ALMEIDA TAVORA

**Advisor/Professor:** Annina Ruest

Déjà vu

### PAOLO BARRERA

**Advisor/Professor:** Annina Ruest

Play, Plague, and Plastic: Using Fun for Environmental Crisis

### HAILEY EZZELL

**Advisor/Professor:** Rachel Luria

Live Musical Performance

## Scientific Illustration

**Advisor/Professor:** Dorotha Lemeh

PEYTON ALLEN, IAN AVILES, LUKE BERG, SAVANNAH DEUTSCH, BEATRICE GIL, SUSANA GOMEZ, HANNAH HESSELBERG, HIBAH HUSSAIN, LIBERTY JUNO, JENNA TOLLEFSON, ERICA TORRES, SATURN VOGLEY, SOFIA WASILEWSKI, AND WINGO

## Honors. Creatures and Monsters

**Advisor/Professor:** Dorotha Lemeh

RACHEL ALLISON, PAOLO BARRERA, NATHALY BAYONA, KASSIDY DUNN, SUSANA GOMEZ, ANDREA GONZALEZ, ISABELLE HAAHR, RACHEL HALL, TRIP KEEFAUVER, ALLISON MACKENZIE, ADDISON MANOFSKY, MATTAN MASRI, MICHAEL MCNEIL, RYLEIGH NEWMAN, BAILEY PALMER, ISABELLA PASSANISL, ANDRE RAJOO, JENNA TOLLEFSON, SOFIA WASILEWSKI, AND WINGO

## Writing and Illustrating Comics

**Advisor/Professor:** Dorotha Lemeh and Rachel Luria

SIENNA AGUIAR, GISSELLE CHAVEZ, IANIS CIOLACU, GAVIN CRAFT, ANGELA EASTERLING, BEATRICE GIL, RACHEL HALL, HELEN HONG, TRIP KEEFAUVER, CAROLYN MAS, MICHAEL MCNEILL, ARJUN NAIR, ANDRE RAJOO, MARIAM RIZVI, RENEE SEALY, AMAN SHAAN, MAIYA SINGER, SATVIKI SINGH, REBECCA STANLEY, SIDNIE WALKER, NIKOLAS WOLFF, HUNTER WOMBLE, DORIS YANG

## Session 3: Research Poster

HC BUILDING

**2:00 - 4:00 P.M.**

### MIA LIN AMATO

**Advisor/Professor:** Erik Duboue

Investigation of Environmental and Genetic Factors on Circadian Rhythm and Longevity

### SOPHIA AMRO GAZZE

**Advisor/Professor:** Lucia Carvelli

Assay Analysis of the Effects of Amphetamine and Trans 2-Phenylcyclopropylamine on *Caenorhabditis elegans*

### KIANNA ANCHETA

**Advisor/Professor:** Shaina Rowell

Integrating Information Literacy in a Developmental Psychology Course

### ANTHONY ANGELASTRO

**Advisor/Professor:** Lucia Carvelli

Analyzing the Effects of Nisoxetine on the Dopaminergic System of *Caenorhabditis elegans* Using Swimming-Induced Paralysis Assays

### ASHLEY BOSWELL

**Advisor/Professor:** Kelsie Bernot

Gopher Tortoise (*Gopherus polyphemus*) 16s rDNA Gut Microbiome Analysis

### RYAN CANTRELL

**Advisor/Professor:** Tanja Godenschwege

Genetic and Environmental Conditions that Regulate Dsd Expression and Function

**GISSELLE CHAVEZ****Advisor/Professor:** Kelsie Bernot

Examining the Presence of Ranavirus in Southeastern Florida Preserves

**IANIS CIOLACU****Advisor/Professor:** Monica Maldonado

Identification of Effective Immunotherapy Targets on the Triple-Negative Breast Cancer Cell Surface

**DARA COHN****Advisor/Professor:** Shaina Rowell

Repeating Information Leads to Increased Truth Perception

**JOURDAN DEFRAIN****Advisor/Professor:** Randy Blakely

Characterizing Expression of the Immune Receptor, IL-1R1, within the Dorsal Raphe Nucleus of Males and Females

**ROSELYN DIAZ****Advisor/Professor:** Alan Kersten

The Formation of False Memories and Actor Changes

**CLAUDIA DIAZ GONZALEZ****Advisor/Professor:** Rachel Corr

Multicultural Historical Development of Cataract Surgery

**ELLEN DIEZ****Advisor/Professor:** Kelsie BernotDetection of *Eimeria* Parasites in *Gopherus polyphemus* of Abacoa, FL**TASHI DILLON****Advisor/Professor:** Ceylan Isgor

Knocking Out Interleukin Receptor 1 Decreases Severity of Post-ictal Cortical EEG Suppression in Generalized Tonic-clonic Seizures

**JESSICA ELKINS****Advisor/Professor:** James Wetterer

A Floral Inventory of Frenchman's Forest Natural Area

**LUNA FERERO****Advisor/Professor:** Tricia Meredith

Optimizing Group Learning Contexts for Underrepresented Students in STEM

**EVANGELINE GEORGE****Advisor/Professor:** Laura Vernon

Forms of Mental Health Stigma Affecting Treatment and Help-Seeking in the Indian Population

**DIMITRIOS GIAKOUMAS****Advisor/Professor:** Kelsie Bernot, Iris Segura-Garcia

Uncovering the Gopher Tortoise Gut Microbiome

**BERNARD HARRIGAN****Advisor/Professor:** Christopher Strain

Florida Environmental Policies and their Implications for Social Justice

**MELANIE HART****Advisor/Professor:** Adele Stewart

Serotonergic Hyperinnervation Modifies Cocaine Responses in Mice Expressing the Psychiatric Disorder-Associated DAT Val559 Variant

**HELEN HONG**

**Advisor/Professor:** April Schimmel, Kelsie Bernot, Iris Segura-García  
The Prevalence of The Novel Species of Anaplasma: Candidatus Anaplasma testudines in the *Gopherus polyphemus* Southern Florida's Population

**HIBAH HUSSAIN**

**Advisor/Professor:** Ashley Kennedy  
Non-Pharmacological Intervention Methods for Neonatal Abstinence Syndrome

**NOOR IBRAHIM**

**Advisor/Professor:** Tricia Meredith  
CRISPR Editing in The Retina of Postnatal Mice

**MARYAM IMRAN**

**Advisor/Professor:** Muhammad Waleed Anjum, Waseem Asghar  
Development of a Cerebrospinal Fluid (CSF) Shunt Device for the Treatment of Hydrocephalus in Point-of-Care (POC) Settings

**RACHEL KAVALAKATT**

**Advisor/Professor:** Monica Maldonado  
Wearable Biomedical Device for the Prevention, Treatment, and Management of Carpal Tunnel Syndrome

**MARLI KNOX**

**Advisor/Professor:** Monica Maldonado  
Tracing Direct Neuronal Projections from the Mouse Perirhinal Cortex to the Hippocampus

**KEEDON LEWIS**

**Advisor/Professor:** Kelsie Bernot  
Molecular Detection of an Unidentified Hepatozoon Species in South Florida Gopher Tortoises (*Gopherus polyphemus*)

**KATE MAIER**

**Advisor/Professor:** Laura Vernon  
Investigating Drosophila Leg Kinematics with an Automated Behavioral Tracking System

**ANUSHKA MANDALAPU**

**Advisor/Professor:** Monica Maldonado  
Investigating Neuronal Mechanisms of Backward Walking in Drosophila Melanogaster

**ADDISON MANOFSKY**

**Advisor/Professor:** Dawei Li  
Genotyping Transposable Element Variants In Chronic Fatigue Syndrome Using Whole-Genome Sequencing

**MICHAEL MCNEILL**

**Advisor/Professor:** Kanybek Nur-tegin  
Supermodel of the World: How Rupaul and RuPaul's Drag Race Forged a Queer Performance Empire

**NADIA MIRANDA-SIFUENTES**

**Advisor/Professor:** Herbert Weissbach  
The Effect of Doxorubicin and Sulindac Drug Combination on Lung and Breast Cancer Cells

**HANNAH MNAYARJI**

**Advisor/Professor:** James Wetterer  
Floral Inventory and Historical Analysis of the FAU Preserve

**JAZMIN MORRIS**

**Advisor/Professor:** Nancy Jones  
Maternal Sensitivity in the Context of Temperamental Fear

**NARESH PADMANABAN****Advisor/Professor:** Erik Duboue

Quantifying Behaviors in Surface and Cave *Astyanax mexicanus* Populations to Determine Stress-Determinant Behaviors

**ALEXANDRA PAPA****Advisor/Professor:** Cathrine Trivigno

Structural Basis for Estrogen Receptor Antagonism by a New Ligand Class

**ARGIA PAPAS****Advisor/Professor:** Kelsie Bernot

The Prevalence of Upper Respiratory Tract Disease in the Abacoa Gopher Tortoise Population

**BRIANNA PARSONS****Advisor/Professor:** Kanybek Nur-tegin

COVID-19 Pandemic Aftermath: How the Labor Force Participation Was Affected

**AVANTHI PAVVALA****Advisor/Professor:** Laura Solt

Investigating the Mechanism behind RORa's Repression of IFN- $\gamma$

**DANIEL PERAMUNE****Advisor/Professor:** Kelsie Bernot

Sequencing the Toll-Like Receptor 4 Gene from *Gopherus polyphemus* and Analysis of Genetic Variation Within the Abacoa Preserve Population

**SHIVANA PERSAUD****Advisor/Professor:** Kelsie Bernot

Detecting The Intestinal Parasite *Cryptosporidium* in *G. polyphemus* within South Florida

**KATIE POQUETTE****Advisor/Professor:** Lucia Carvelli

Effects of Ablation of Dopaminergic Neurons on Dopamine Release and Uptake in *Caenorhabditis elegans*

**TEJAS PURIMETLA****Advisor/Professor:** Catherine Trivigno

Identifying Tethering Proteins Important for Mitochondria-Actin Interactions

**ANDRE RAJOO****Advisor/Professor:** Lucia Carvelli

The Neuroprotective Compound Ellagic Acid Reduces Oxidative Stress and Behavioral Changes Caused by Amphetamine

**ALEX REBURN****Advisor/Professor:** Bharat Verma

Sea Turtle Strandings Understood Through Data Analysis

**LAUREN REYNOLDS****Advisor/Professor:** Christopher Strain and Tim Steigenga

Therapy in a Click: School-Based Tele-Mental Health Solution

**MARIAM RIZVI****Advisor/Professor:** Christopher Strain and Tim Steigenga

Henna for Hope: Fighting to Improve Female Literacy in South Asia

**GABRIELLE RUIZ****Advisor/Professor:** Christopher Strain and Tim Steigenga

Care to Help Pet Sitting™

**JAMIE SABAC****Advisor/Professor:** Kelsie Bernot

Detecting *Helicobacter* Infection In Gopher Tortoises of South Florida

**MARK SADEK**

**Advisor/Professor:** James Wetterer  
Bee Venom Therapy – A Potential Treatment Option for Diseases and Chronic Illnesses

**STEVEN SHATKHIN**

**Advisor/Professor:** Adele Stewart  
The Antipsychotic Sulpiride Rescues only Select Behavioral Phenotypes in DAT Val559 Mice

**SATVIKI SINGH**

**Advisor/Professor:** Jill Rahaim  
Characterizing Biodegradable Chitosan–Silver Nitrate Hydrogels to Combat Hospital Acquired Infections

**VENKATA SOMESULA**

**Advisor/Professor:** Ryohei Yasuda  
The Effect of Rab10 Loss of Function on Hippocampal Dependent Learning and Memory

**OLGA ST-ONGE**

**Advisor/Professor:** Yaouen Fily  
Morphologies of Active Galactic Nuclei Host Galaxies Observed in Mid-Infrared Wavelengths

**JACK SWANK**

**Advisor/Professor:** Kevin Lanning  
Salary Prediction Search: How University, Concentration, Degree Level, and Cohort Year Impact Future Earnings

**THANH TON**

**Advisor/Professor:** Lucia Carvelli  
The Potential Role of H3K9 Methylation in Maintaining the Long-Term Effect of Amphetamine

**ISABELLA VALLEJO**

**Advisor/Professor:** Kevin Lanning  
Linguistic Characteristics Related to Suicidality Using an Existing Data Archive of Reddit Posts

**AETHER VAN HORN**

**Advisor/Professor:** Ericca Stamper, Jon Moore, Iris Segura–Garcia and Kelsie Bernot  
Sequencing Brain–Derived Neurotrophic Factor in *Gopherus polyphemus*

**MIA VILA**

**Advisor/Professor:** Tricia Meredith  
Long-term Consequences of Amphetamine Use in Adolescence

**KENNETH WHITE**

**Advisor/Professor:** Kelsie Bernot, Iris Segura–Garcia  
Molecular Identification of a Hepatozoon Parasite in *Gopherus polyphemus* Populations in the Abacoa Greenway Preserve and Florida Atlantic University Ecological Preserve

**NIKOLAS WOLFF**

**Advisor/Professor:** April Schimmel  
Sequencing and Molecular Analysis of the *Gopherus polyphemus* CD40 Gene in Abacoa and Boca Raton Preserves

**XUE YANG**

**Advisor/Professor:** Kelsie Bernot  
Sequencing and Analyzing Diversity of MHC class I Gene in South Florida Gopher Tortoise Populations

## Abstracts: Oral

## ALPHABETICAL BY STUDENT'S LAST NAME

**JONATHAN BARROSO****Proportional Punishment: Fair vs. Efficient**

Kaplow and Shavell, two scholars of law and economics, defends the utilitarian approach to punishment. They try to find the most efficient way to deter crime using a mathematical formula. According to their efficiency formula, the ideal sanction is the expected utility of the crime divided by the probability of conviction. This calculation could be effective in deterring crime, but it often leads to disproportionate punishments. I argue that a retributivist approach is a better option for a society as it uses proportional punishment with an underlying principle of punishing for justice. Even in the United States, cruel and unusual punishments are prohibited and that includes those that are disproportionate. This shows that on a practical basis, using a proportional punishment model that is often expressed in a retributivist philosophy can be effective.

**NATHALY BAYONA****The Concept of Closure and its Use in Comics and Film**

Writer Scott McCloud introduces the concept of "closure" in his book *Understanding Comics* where it's explained as "the details filled in by the audience in a story based upon previous knowledge." For example, an image of a crying person in a hospital in a drama, we infer that something happened to someone close to the person. The concept of closure can be observed in media beyond film or comics, such as books or visual art, and it can enhance the way people engage with a piece of media or hinder it. Too much closure can be alienating, too little can feel insulting to the audience's intelligence. In this presentation, I will explain why the concept of closure is instrumental to storytelling and how it's utilized in comics and film.

**CAMILLE BERARDONE****Reproductive Success and Settlement of Brooding Sponges in the Florida Keys**

Global warming is likely to affect fecundity, spawning, and larval survival and settlement of marine invertebrates. However, current reproductive output and larval survival for many sponge species (Phylum Porifera) is unknown. Our objective was to determine the population reproductive success and settlement in three brooding sponge species, *Spongia barbara*, *Spongia cheiris*, and *Coscinoderma lanuga*. Larvae were collected in summer 2022 in the Florida Keys. Individual reproductive success and settlement were quantified by tagging and placing traps on sponge adults during two full moon events. We observed asynchronous larval release in all studied species, with pulses before, during, and after the full-moon week. *Spongia barbara* fecundity and reproductive success was higher than in other species; however, *Coscinoderma lanuga* had the highest percentage of larval settlement after 24 hours. These results support the conservation of sponge populations and help assess the viability of species for a new sponge land-based nursery at HBOI.

**ASHLEY BOBNAR****Post-Settlement Developmental Timeline in Brooding Sponges**

Marine sponges (Phylum Porifera) are integral components of benthic habitats, supplying a variety of critical ecological services and maintaining ecosystem balance. Although sponge larval stages are well known, the development of recruits to the juvenile is mostly unknown. We determined a timeline of post-settlement developmental stages for four species of sponges. Larvae were collected in-situ during the summer months of 2022 from the Florida Keys and the Indian River Lagoon, transported to the lab, and raised in an environmental chamber at Florida Atlantic University's Harbor Branch Oceanographic Institute. Developmental characteristics, including marginal growth layers, canals, osculum, choanocytes, choanocyte chambers, pigments, and spicules were quantified. Survival and growth rates were obtained and compared across species over three months. Here we present the chronological order of milestones for developmental stages in sponge recruits. This knowledge is critical for species restoration, biomedical research, and aquaculture practices.

**MICAH CAMPBELL****Aging Communities: Celebrating the Aging Process In Art**

Art can be used to represent human experiences, such as the natural aging process, and how different communities age. In visual storytelling, depicting age and the passage of time is not just an option, but sometimes a requirement. Aging can be represented using various lines, textures, shades, and different artistic mediums. In this poster presentation, we will visually analyze and compare artistic methods used in comics to illustrate the aging process in different racial and age groups. These illustrations will depict four ethnicities: Asian, Black, Hispanic, and White characters across the four different stages of life: childhood, adolescence, adulthood, and the elderly. This poster presentation will educate viewers on the beauty of aging among different ethnic groups, and how it is represented in art.

**JAKE CHAVIS****The Effect of Age on Post-Hypoxic Survival Rates of *Drosophila melanogaster***

*Drosophila melanogaster* responds to oxygen deprivation (hypoxia) by entering a spreading depression, slowing metabolic pathways. When reintroduced to normoxic conditions, there is a burst of reactive oxygen species (ROS). One potential target is the sulfur atom in methionine that forms methionine sulfoxide when oxidized. The family of enzymes called methionine sulfoxide reductase (MSR) reduces oxidized methionine, restoring functionality. Our lab has created genetic lines of *Drosophila* which are homozygous wildtype for both genes or homozygous for non-functional (null) alleles of MSRA and MSRB. We previously showed that recovery from hypoxia is age-dependent in flies lacking any MSR activity. Young MSR-deficient animals recover nearly as well as young wildtype flies. However, as the animals approach old age, recovery and survival of hypoxic stress decline dramatically in MSR-deficient animals. Levels of cGMP-dependent protein kinase (PKG) influence recovery and survival following hypoxia. The experiment addresses the question of whether MSR-deficiency affects PKG levels.

**SHANECE COPPIN****Guilty but Insane?: The Case of John Hinckley**

On March 30th, 1981, John Hinckley tried to assassinate President Ronald Reagan using a .22 caliber revolver. As a result, he wounded Reagan, Secret Service Agent Tim McCarthy, police officer Thomas Delahanty, and White House Press Secretary James Brady (who was left permanently disabled and died in 2014 from his gunshot injuries). Hinckley did so to grab the attention of Jodie Foster from the film *Taxi Driver*. Hinckley was found not guilty by reason of insanity and placed into psychiatric care. I argue that Hinckley should be found guilty but insane under the retributive theory of punishment. After discussing Hinckley's background leading up to the attempted assassination of Reagan, I explain two ethical theories of punishment (utilitarianism and retributivism). Then, I address how they would rule in Hinckley's case. Lastly, I will defend the retributive theory, and argue that it would support a guilty but insane verdict.

**SARAH DIEHL****Exploring Fractals: the Mandelbrot Set**

A fractal is a shape that is self-similar through infinitely many iterations. There are many instances of fractals in nature, but they can also be computer-generated. One of the most notable examples of a computer-generated fractal is the Mandelbrot set, which is defined as the set of those  $z$  for which the orbit of  $f_{\{c\}}(z) = z^2 + c$  is bounded. This set is an instance of how a simple iteration can be extremely intricate.

**DAWID DIGANGI****A New Labor Movement: What Motivates Workers to Unionize and What Stands in Their Way?**

Prior to the COVID-19 pandemic, union rates in the United States were at their lowest since the 1980s. The recent success of unionization efforts at companies such as Amazon and Starbucks raises questions about what makes unionization successful and which factors explain the current resurgence in labor organizing. This thesis explores theories about what drives workers to unionize, including feelings of dissatisfaction and estrangement (Marx), the gap between an employee's expectations and achievements (Wheeler), community and social movement solidarity, legal frameworks, and other factors. I concluded that the current state of weak union laws in the United States causes employees to face adversity in unionizing, and U.S. workers are trending toward direct action rather than bureaucratic negotiations in their attempts to organize with varying degrees of success.

**ANGELA EASTERLING****Facial Emotion Recognition in Children with Autism Spectrum Disorder**

The purpose of this study is to gain understanding of the emotion recognition abilities of children with ASD and TD by examining their ability to accurately recognize facial emotions from computer-generated dynamically morphed displays. The emotions to be recognized by participants of the study will include happiness, sadness, anger, fear, and new emotions are to be added, including surprise and disgust.

**HAILEY EZZELL****Ghost Writers**

Do you believe in love after life? In the novel *Ghost Writers*, readers follow Samantha Roland as she leads her rock band, *Approaching Grace*, to world domination. Wild success, adoring fans, and awesome music were all on the travel docket—but ghosts? Framed as an autobiography written by Samantha as a reflection on her journey to and in the spotlight, *Ghost Writers* explores themes of life and death, love and hate, and rock and roll. Readers get to ride along on the haunted tour bus for the time of their lives in this humorous and touching story of friendship, determination, and love across barriers. This presentation will include a plot synopsis, as well as a reading from the author, and a discussion of the creative process behind the creation of the novel.

**RUBEN GARCIA-NAVARRO****The Frozen Straits: U.S.-Cuba Relations as a Multi-Level Game**

This thesis analyses U.S.-Cuban relations through the lens of William LeoGrande's (1998) two-level game theory. A historical analysis of the chills and thaws in U.S.-Cuban relations prior to, during, and after the Cold War suggests that U.S. and Cuban policy makers consistently address both domestic and international concerns before deciding the course of their diplomatic actions. In other words, policy outputs are impacted by lobbyists, sub-national groups, the makeup of Congress, changing international contexts, and other factors not otherwise explained by systems level theories or ideological differences. Understanding the multiple input factors in U.S. policy helps to explain why little progress has been made in U.S.-Cuban relations more than 30 years after the end of the Cold War.



**IRENE GATIMI****Approaching China's Belt and Road Initiative's Debt-trap Diplomacy**

This thesis examines whether China's Belt and Road Initiative (BRI) is promoting economic development or downfall in the form of debt-trapping to 9 participating economically emerging countries. The Belt and Road Initiative (BRI) is the world's largest infrastructure program, launched by the Chinese government in 2013. Since its inception, Chinese financial institutions and businesses have financed and constructed a wide range of global projects. I utilize qualitative and quantitative methods in the form of primary and secondary sources and data on economic growth rates and debt accumulation rates to explore the effects of the BRI in participating countries. There was no uniform consequence of the BRI, but rather characteristic-dependent effects that varied across cases. By understanding the impact of the BRI in these countries, we can better recommend how countries carrying similar characteristics to participating countries should approach the BRI.

**NIHASIKA GOPI****Delineating the Intracellular and Extracellular role of MMP-14 in Primary and Metastatic Pancreatic Cancer**

Pancreatic cancers are among the most difficult cancers to treat with a median 5-year survival rate of 9%. Matrix metalloproteinase 14 (MMP-14) is a membrane associated proteolytic enzyme affiliated with cancer proliferation, migration, angiogenesis, and collagen turnover. These known characteristics are associated with its extracellular expression; however, little is known about its non-proteolytic intracellular role. Pancreatic cancers are well known to have hypoxic niches that can lead to inflammation resulting in angiogenesis and altered MMP expression. Current research utilizes normoxic culture conditions, as opposed to hypoxic conditions. This study uses two human pancreatic cell lines from a primary and metastatic site, BxPC-3 and HPAF-II respectively, to investigate the expression of extracellular/intracellular MMP-14 using flow cytometry under normoxia and hypoxia, elucidating a potential mechanism of by which pancreatic cancer become metastatic.

**MICHELLE GRAS****Sulindac enhances the effect of doxorubicin on pancreatic cancer cells**

Pancreatic ductal adenocarcinoma (PDAC) is one of the most lethal cancers and the fourth leading cause of cancer-related deaths. The five-year survival rate has not been significantly improved using current treatment methods. Our previous findings demonstrated that sulindac, an FDA-approved non-steroidal, anti-inflammatory drug, can sensitize cancer cells to agents that cause oxidative damage. We have also shown that sulindac protects normal retinal, cardiac, and neuronal cells from reactive oxygen species induced oxidative damage. Doxorubicin is an effective anticancer drug, but its use is limited due to its cardiotoxicity. We hypothesize that a dual drug treatment of sulindac and doxorubicin, should enhance the efficacy of doxorubicin in killing cancer cells while protecting against cardiotoxicity. For these studies, BxPC-3 and HPAF-II cell lines were used. Our results demonstrate that sulindac enhances the killing effect of doxorubicin in PDAC cells.

**HAVEN GRAY****Guns and Times: Originalism and the United States Supreme Court Decision in New York State Rifle & Pistol Association, Inc. v. Bruen, 597 U.S. \_\_\_ (2022)**

The recent United States Supreme Court decision in New York State Rifle & Pistol Association, Inc. v. Bruen, 597 U.S. \_\_\_ (2022), written by Justice Clarence Thomas, established that states enacting restrictions on the Second Amendment right to keep and bear arms must now demonstrate that their restrictions are "consistent with the Nation's historical tradition of firearm regulation." The notion that the Supreme Court should defer to historical sentiments and the perceived original intent of the framers of the Constitution is known as originalism and is becoming increasingly prevalent in the decisions of the Court. Originalism fails in that it requires U.S. Supreme Court justices to rely on biased amicus curiae briefs and an incomplete understanding of history when rendering their decisions. I will argue that Justice Thomas's appeal to historical understandings in NYSRPA v. Bruen is not only a flawed theory of constitutional interpretation, but also historically inaccurate.

**MIA GRAZEL****An Exploration of User Interface and User Experience Through Psychology**

The advent of digital technology in the last fifty years has opened up innumerable options for careers in such spaces. The integration of psychology into the fields of both user interface (UI) and user experience (UX) is a rather recent development. UI centers around the design of an aesthetic interface, while UX focuses on product design, whether physical or digital. The fields of UI and UX work in tandem to enhance the experiences of those interacting with the products produced. Psychological concepts such as color theory, design principles, and personality studies have contributed to the work done in both UI and UX. These and other such concepts will continue to embed themselves in the fields and study of UI and UX. A deeper understanding of the interactions between psychology and UI/UX will allow for greater experiences to be had with products in an age more digital than ever.

**JULIA HENSLEY****Potential Effect of Hurricanes on Sea Turtle Strandings in Central and Southeast Florida**

Sea turtle strandings are frequent on Florida's Southeast coast and can occur due to animal exhaustion, fatigue, sickness, or injuries. Although the effect of hurricanes has been evaluated on sea turtle nests, its impact on strandings in Florida is uncertain. This study aimed to determine the potential effect of hurricanes on sea turtle strandings in central and southeast Florida. Data were obtained from Florida Fish and Wildlife Conservation (FWC) Sea Turtle Stranding and Salvage Network (STSSN). We found the number of sea turtle strandings increased over time from 1980 to 2017 and reached its highest for *Caretta caretta* and *Chelonia mydas* between 2008 and 2017. However, sea turtle strandings decreased during hurricane Sandy (2013), and after Matthew (2016), and Irma (2017). Our findings demonstrate that other factors besides storms may play a more substantial impact on sea turtle strandings.

**KARIS HONG****Effects of SARS-CoV-2 gene expression on chemosensory systems in *Drosophila melanogaster***

The ongoing COVID-19 pandemic has emphasized the need to understand the effects of SARS-CoV-2 on human biology. One aspect that is not well understood is the impact of individual SARS-CoV-2 proteins on taste and smell. The chemosensory system is crucial for survival, facilitating feeding behavior. In this study, *Drosophila melanogaster* was used as a model organism to investigate the relationship between loss of chemosensation and COVID-19 proteins. The SARS-CoV-2 proteins ORF8, ORF6, and Nsp3 were studied as they have high pathogenic potential and impact on human cell viability and immunity. Our study used the binary choice "capillary feeder assay" to observe the effects of these proteins on the food preference. The results showed that Nsp3 and ORF8 could play a role in the loss of chemosensation in specific age ranges. This research may lead to pharmaceutical solutions for the loss of chemosensation in COVID-19 patients, improving diagnosis and treatment.

**MEGHAN KEOUGH****Testing and Retesting for Upper Respiratory Tract Disease (URTD) in a Population of Gopher Tortoises in South Florida**

Several factors have contributed to the decline in the population of gopher tortoises. One of which is Upper Respiratory Tract Disease, URTD. This is caused by two highly contagious bacteria, *Mycoplasma agassizii* and *Mycoplasma testudineum*, and results in symptoms such as conjunctivitis and ocular and nasal discharge. The lack of knowledge about the long-term effects makes further etiological research necessary. This research study focuses on the wild gopher tortoise population in Range IVa of the Abacoa Greenway in Jupiter, FL. Twenty-five specific target tortoises, who have previously been tested for *Mycoplasma agassizii* and, in some individuals, also *M. testudineum*, were retested through blood samples. Size measurements and external symptoms of URTD from individuals, when applicable, were recorded. Blood samples underwent ELISA serology for both antibodies at the *Mycoplasma* Research Laboratory of the University of Florida. Results were statistically analyzed and compared to previous tests from the same tortoises.

**MADELYN MACIAS****The Psychology Behind Police Interrogations**

While manipulative interrogation tactics used by police officers may, at times, result in a guilty person confessing to a crime they committed, there are two major objections to the police using such tactics. First, these tactics are unjust because they lead to false confessions and miscarriages of justice in which an innocent person is punished, and the actual culprit remains free. Secondly, these tactics are unethical because they fail to treat people with dignity. I argue for reforms of interrogation tactics both to reduce the number of false confessions and more accurately secure the truth, and to honor one's dignity. I combine psychological research on police interrogation tactics and analysis of court cases to determine which police tactics need to be reformed to create a more just and ethical system.

**KATHRYN MARTIN****A Study to Elucidate Matrix Metalloproteinase 14 Expression in Pancreatic Cancer Cell Lines Under Both Normoxic and Hypoxic Conditions.**

Various key players have been implicated in the development of pancreatic cancer, among these is a member of the matrix metalloproteinase (MMP) family of proteolytic enzymes, MMP-14. This enzyme's proteolytic activities have been implicated in cancer proliferation, invasion, and metastasis; however, little is known about its non-proteolytic and/or intracellular roles. Furthermore, research to date has focused on in vitro cell culture conditions under normoxic conditions, yet cancer exists physiologically under hypoxic conditions. Under physiological hypoxic conditions members of the MMP family have been associated with altered cellular behavior. Thus, there is a need to elucidate MMP-14's roles under both normoxic and hypoxic conditions. This study seeks to: (1) characterize the expression of MMP-14 in representative pancreatic cancer cell lines in relation to other cancer associated MMPs; (2) elucidate the impact of hypoxic conditions on MMP-14 expression and/or functionality; (3) monitor the differences at both the gene and protein expression levels.

**NATASHA MAYORGA****Exploring nonmuscle myosin II subcellular localization and dynamics in dendritic spines**

Learning and memory storage in the brain is driven by synaptic plasticity - the rapid formation and stabilization of connections between neuronal axon terminals and dendrites. During methamphetamine use, neurons in the basal lateral amygdala (BLA) brain region undergo aberrant plasticity where a subset of synapses remain plastic, resulting in persistent memories of drug use. We hypothesize that this unique plasticity is achieved through distinct expression patterns, trafficking, and interacting partners of nonmuscle myosin II B protein. To visualize and track endogenous protein, we have created a transgenic mouse line with a genetic knock-in at the Myh10 locus encoding labeled NMIIIB. Visualizing cultured neurons from this mouse line with PALM and STORM super resolution techniques will elucidate trafficking and dynamics of NMIIIB in the context of various brain regions and methamphetamine exposure. Ultimately, we hope this will help us better understand the role of NMIIIB in memory formation and storage.

**JULIA MCDUFFEE****Quantification of the 460L Abberior dye's response to STED**

Imaging very small structures is restricted by the diffraction limit. To combat this problem super-resolution microscopy is used, and in particular stimulated emission depletion (STED). Multi-color imaging is used to examine interactions of proteins and structures in a biological environment. The number of colors used during multicolor STED imaging are limited, unless a long Stokes' shift dye is used such as the 460L Abberior dye. For this project, its photo resilience and response to the STED technique was quantified to obtain the optimal imaging parameters. Preliminary data shows that the dye responds to STED in the expected manner. These parameters will provide the highest resolution images for the structures stained with 460L dye, while ensuring the integrity of the dye remains sound, and it does not bleach away. This will be useful in the context of biological research, and more specifically the identification of synapses.

**AMANDA MULVANEY****The FBI's Raid of Trump's Mar-a-Lago and the Limits of Executive Privilege**

Each president of the United States is afforded a right to withhold sensitive information from other branches of the U.S. government in order to maintain confidential communication within the executive branch. Many presidents have invoked this executive privilege. However, this right is not absolute; the Supreme Court has set some restrictions on executive privilege. After examining former President Donald Trump's invocation of executive privilege in keeping sensitive documents at his home in Mar-a-Lago after his presidential term expired and reviewing the history of executive privilege, its origin and its previous uses and limits, I argue that executive privilege should be more limited in the wake of the Trump administration.

**BAILEY PALMER****The Viking Onore: Limits of Man**

A story-driven, animalistic character design experiment served as the basis for this creature, which I call the Viking Onore. My design combines natural elements of the animal kingdom with concepts steeped in fantasy and lore. In order to fully flesh out the character's environment, I combined this project with an existing one. Many of the behaviors the Viking Onore developed were influenced by the presence of a Protector, a monster that protects the habitat of many magical creatures by preventing the invasion of others. In my work I am exploring the concept of Man being prevented from going into untouched lands by implementing a singular factor that prevents their ideas from spreading, thus isolating the habitat of the Onore from the habitat of humans.

**HELEN PELUSO****"They are Just Like Me!": An Analysis of Accurate Mental Health Representation in Fiction and the Application of Psychological Research in Creative Writing**

It can be cathartic for readers to see themselves in the innermost thoughts and feelings of literary characters. However, when mental health representation is done poorly or not considered at all, it can be damaging to readers' self esteem. As seen in the popularized "teen sick-lit" genre, overemphasized mental illness can provide readers a pessimistic outlook on life. Because of the power that novels hold, accurate portrayal of characters' mental health should be a priority. The current study encourages authors to include and improve the representation in their writing with a two-pronged approach. To investigate the current state of representation in contemporary fiction from a psychological perspective, examples of character mental health and productivity of the representation are reviewed alongside clinical research. Using this research, a creative writing sample was crafted and analyzed to the same degree. By approaching representation with such care, literature can move in a brighter direction.

**KASEY PREISSER****Origami Constructible Numbers and Solving the Problems of Antiquity**

The Problems of Antiquity, which have challenged and fascinated mathematicians for hundreds of years, include squaring the circle, trisecting the angle, and doubling the cube. Mathematicians of Ancient Greece attempted to solve these problems through the traditional construction methods involving a compass and straightedge. It was discovered in the nineteenth century, however, that these problems are impossible to solve using a compass and straightedge. Surprisingly, it is origami - the ancient art of Japanese paper folding - that holds the key to solving two of these classical problems. The development of the field of origami constructible numbers has led to modern axioms that, when coupled with traditional paper folding techniques, make trisecting the angle and doubling the cube possible. The applications of mathematical origami are seemingly endless, ranging from solving these ancient problems to designing folding space telescopes.

**ANNABELLE ROSA****The Ethics of Territories: The Unconstitutionality of Puerto Rico's Status as an Unincorporated Territory**

The Fourteenth Amendment of the United States Constitution states that "all persons born or naturalized in the United States, and subject to the jurisdiction thereof are citizens." The island of Puerto Rico has been a territory of the U.S. since 1898 after its cession following the conclusion of the Spanish-American War. Subsequently, the citizens of Puerto Rico are considered U.S. citizens, however, there are limits to that citizenship. In the Insular Cases, a series of Supreme Court Opinions from 1901, the Court created a distinction between incorporated and unincorporated territories. Despite being considered U.S. Nationals, citizens of unincorporated territories are not afforded the same rights and privileges of mainland citizens. I use Puerto Rico as a case study to address the ethics and constitutionality of maintaining partially incorporated territories.

**MARIA SAAVEDRA****The Effects of Exercise on Anxiety A Correlational Study**

Too much anxiety can lead to social isolation, poorer health, and other negative outcomes. Exercise can decrease stress levels, increase mood, and decrease anxiety. The study examines how aerobic and anaerobic exercises may reduce anxiety for people of different ages. To measure anxiety, the State-Trait Anxiety Inventory (STAI) will be used. A survey will be used to measure aerobic and anaerobic exercise. The correlation between amount of aerobic and anaerobic exercise and level of anxiety will be computed. It was hypothesized that individuals who exercised for longer than 20 minutes a day would have reduced anxiety levels and increased mood. The second hypothesis was that younger adults between 18-35 would show greater positive effects of exercise on anxiety reduction because they have higher-intensity workouts. The findings obtained based on the conducted survey can provide further information on the connections between exercise and anxiety reduction among different age groups.

**RENEE SEALY****Dignity is Inherent, but Respect is Earned: The American Criminal Justice System's Treatment of its Prisoners**

Notorious serial killer Jeffrey Dahmer terrorized and killed his victims in the 1980's. Some argue that criminals like Dahmer who commit gruesome acts forfeit their right to be treated as a human being. I argue instead that while criminals like Dahmer should not be respected, they should be treated with dignity. Dignity is an inherent value assigned to a person because they are human beings. Respect, in the sense of admiration, is not inherently owed to all human beings. Respect is earned, and can be forfeited by criminals as a result of their wrongdoings. I propose ways that the American criminal justice system should be reformed so that we still treat criminals with dignity even if we don't respect them.

**STEVEN SLAMAN****Effect of Homeowners Associations on Sold Price of Residential Properties in Palm Beach Gardens**

Homeowners' associations (HOA) provide services and rules for homeowners in their associations. The benefits and restrictions provided by HOAs are one of many factors considered by home buyers when purchasing a house. This thesis analyzes data obtained from Multiple Listing Service (MLS) data from the Palm Beach chapter of the Realtor Association. It conducts a regression analysis to determine how impactful an HOA is on the sold price for residential properties in Palm Beach Gardens (PBG). The analysis shows a negative relationship between having an HOA and the sold price of residential properties in PBG. Conversely, higher monthly HOA fees had a positive impact on sold price. Previous papers suggest a positive premium for HOAs, contrary to what our work found. The area of PBG could be abnormal, or the discrepancy could be for factors not captured in the data. Further research is needed to determine what caused this change.

**TAYLER VINCIGUERRA****Is ADHD Directly Related to Eventual Participation in Criminal Behavior?**

Attention Deficit Hyperactivity Disorder (ADHD) is among one of the most thoroughly studied disorders in psychological and neurological fields that examine psychopathology, along with being one of the most common as well. It is known to have symptomatic features that may have a relationship, in some way, to outcomes that are linked to criminal behaviors. However, due to the disorder's various facets, comorbidities, and unique socio-environmental interactions, this relationship between ADHD and criminality is a rather complex and psychologically difficult one to ascertain. A number of peer-reviewed studies were analyzed and integrated in this literary review in order to explore this relationship, and the overall consensus that has been found here emphasizes a more indirect relationship between ADHD and criminality, with external factors mediating the eventual participation in non-violent and violent forms of crime in tandem with ADHD.

**ALLEN VO****The Internet's echo chambers and their effect on information disorder, hate speech and violent radicalization**

In an age when information can be easily accessed online, it is vital that society prepares to create countermeasures against misinformation. A lack of preparation allows echo chambers to fester and metastasize across social media websites for malicious vested interests. This paper aims to investigate Internet "echo chamber" culture and its effect on information disorder, hate speech, and violent radicalization. I argue that echo chambers expedite the rise of fake news, disorders of information, and hate speech, and promote violent radicalization of targeted groups primarily on social media. An issue I address is whether censorship of echo chamber rhetoric will cause more negative than positive effects within social media communities. The 1st amendment protections of free expression are important therefore we should be wary of censorship and promote critical thinking skills to counter fake news and misinformation.

**SIDNIE WALKER****Are U.S. Medical Programs Successfully Addressing Racial Factors of Healthcare Equity?**

Racial and minority health disparities have plagued the United States of America for years. Despite developments in science and the medical field, many groups in our society are disproportionately affected by insufficient healthcare. This paper will explore whether or not medical programs in the U.S. successfully address the racial factors of healthcare inequity. The history of health inequity in the U.S. will be discussed to assess racial inequity in healthcare in its current state. Factors such as social determinants of health, everyday health disparities, and patient-clinician relationships will highlight evidence of the ongoing issue of healthcare inequity. Medical programs in the U.S. have the proper tools to achieve healthcare equity; however, it is imperative that the structure of society, in terms of legislation, changes to promote healthcare equality regardless of race.

**JOHN WALSH****Determining Incident Likelihood in Football Stadiums using Apriori Association Rules Mining**

Given that the government is rekindling the public interest in sports by hosting the World Cup in the United States, it is vital to better understand security and safety incidents at stadiums. Predicting incidents at sports stadiums is valuable for ensuring safe sporting events. Some stadium incidents include fan misbehavior, security incursions, and maintenance requests. We used proprietary data from a football stadium to build our model. We chose the Apriori Association Rules Mining Algorithm (ARM) to model the data. We chose ARM due to the co-linearity of features and the depth of the data. Some findings were that security incidents are more likely to occur during the post-game of the postseason. Also, specific locations had higher security incidence likelihood. Another of the findings was venue maintenance most often occurs near the end of every calendar year.

**MEGAN WHITE****Effects of Dienogest and Non-calcemic Analogs of Vitamin D on Endometriosis Cells In Vitro**

Endometriosis is a debilitating disease categorized by the proliferation of ectopic endometriotic lesions. Dienogest is a progestin that inhibits endometrial lesion growth and vitamin D3 inhibits cell proliferation. In this study, we observed the inhibitory effects of Dienogest alongside non-calcemic analogs of vitamin D in vitro to establish a new and safer synergistic treatment option for endometriosis. We investigated the synergistic, antiproliferative effects of Dienogest and vitamin D3 in culture and quantified treatment efficiency through cell count and cell viability assays. Dienogest and vitamin D3 successfully displayed growth inhibition in both the cell count and viability assays. Further studies of Dienogest and vitamin D3 treatment are needed to confirm treatment synergy, but our model has demonstrated that Dienogest and vitamin D3 are a plausible combined treatment for endometriosis.

**WARREN YEE****Computer Vision: A New Pair of Fresh Eyes to Study Animal Behavior**

Computer vision has completely changed the way we study animal behavior. Over the past 15 years, researchers have developed several computer vision-based tools to automatically track an animal's position and pose through time. This data can then be used to uncover the reasons behind the animal's behavior. In this talk, I will compare two tracking tools, one based on contrast detection (Trilab-Tracker), and one based on machine learning (DeepLabCut), in order to determine which one is better at formulating the trajectories of Mexican cavefish (*Astyanax mexicanus*) swimming in a circular tank.

**Abstracts: Visual Arts and Creative Research**

## ALPHABETICAL BY STUDENT'S LAST NAME

**ARTHUR ALMEIDA TAVORA****Deja vu**

Deja vu is an experimental short film. It is a Machinima that I created in Unreal Engine 5, a real-time 3D game engine. This virtual film production was shot entirely in first person-perspective. The first-person character walks and flies through a variety of environments, including rocky and snowy mountainous landscapes. Although certain parts of the film appear to be real, they were entirely created within a game engine. Deja vu was created using highly realistic sculpted and textured 3D models. The goal of this project is to immerse the viewer in a lifelike environment that gradually becomes less realistic causing the viewers to question the veracity of the images they are seeing. In addition, I wanted to encourage viewers to use Deja vu as a medium to reflect on the state of technology in today's world. It's fascinating to see how we have progressed to the point where we can create images and videos on a computer that are equivalent to images taken in real life.

**PAOLO BARRERA****Play, Plague, and Plastic: Using Fun for Environmental Crisis**

The complexity of environmental issues is unique because there are many different stakeholders involved. Human or not, all involved parties bring their own problems and solutions. The environmental technology industry is fragile for the same reason: many factors are at play, and stakeholders are trying to be satisfied by technology. It feels like a lose-lose situation when proposals fix certain ecological problems but exacerbate others. My game will explore the questions: how much fun, humor, and play are useful for engaging and understanding complex issues? In the lose-lose scenarios of ecological crisis, can games equip players with a consciousness to critique what is "a win"? It's important to establish a discourse on utility in green technology because technological innovation and individual behavior do not necessarily create better solutions. I aim to critique the idea of technological progress in the environment by illustrating the complexity of environmental crisis with humor/play.

**HAILEY EZZELL**

**Live Music**

Swing by this presentation to catch some live music performed by Ghost Writers author and presenter Hailey Ezzell. Hailey will be playing and singing covers, original material, as well as a song inspired by her novel Ghost Writers. This presentation works in conjunction with the Ghost Writers presentation, as it will serve as an example of the music which inspired and is performed in the novel, in addition to showing how the main character of the story might perform in the real world. This presentation can also be enjoyed separately as well as a break from the talks.

**KATTARYNA SALZMAN**

**Unin's Delivery Adventures**

The game, Unin's Delivery Adventures is about the relationship between trees and microscopic fungi in the soil called mycelium. The mycelium helps trees communicate and sends nutrients to other trees. Here a fantastical take has dryads and mushroom spirits interacting. Unin, the playable character, travels through tunnels, representing the mycelium networks, to get lunches from the parent dryad to her children. Unin can also collect energy points, similar to how the mycelium takes nutrients from the trees in return for their services. There are two endings to this game, one for simply delivering the dryad lunches, the other for collecting all energy and delivering the lunches.

**KIMBERLY SCHWEIGER**

**Alone**

Alone is an interactive digital narrative. It is about being trapped in your own mind. This interactive experience walks through Edgar Allan Poe's poem, Alone. The character, Dave, is struggling to figure out who he is. His thoughts appear on the screen in a smaller font text, while the size of the poem is larger. Dave cannot escape the confines of his own mind, and so the game essentially repeats once you think you reach the end. The black background makes the player feel the vastness of loneliness and how cold it can be.

**ART 4934C: HONORS. CREATURES AND MONSTERS**

The public's fascination with creatures and monsters extends to everything from storybooks to animated productions and films. The tales surrounding their existence span hundreds of years of explorations of the human mind's inventiveness and experimentation with the unknown. Featured works created by students in ART 4934C: Honors Creatures and Monsters, Rachel Allison, Paolo Barrera, Nathaly Bayona, Cassidy Dunn, Susana Gomez, Andrea Gonzalez, Isabelle Haahr, Rachel Hall, Trip Keefauver, Allison Mackenzie, Addison Manofsky, Mattan Masri, Michael McNeil, Ryleigh Newman, Bailey Palmer, Isabella Passanis, Andre Rajoo, Jenna Tollefson, Sofia Wasilewski, and Wingo, will be on display during Symposium.



**IDS 3932: WRITING AND ILLUSTRATING COMICS**

Whether you call them comics, graphic novels, or sequential art, the meaningful and deliberate juxtaposition of words and images is a powerful and popular storytelling medium. This art form has been used to explore everything from super heroes to the Holocaust. Students in this class practiced the illustrating techniques and storytelling craft to create their own original comics covering a wide range of subjects.

**ART 3932C: SCIENTIFIC ILLUSTRATION**

For centuries art and science worked in partnership to explore and examine our world. Their collaborative efforts are centuries old dating back prior to the age of the Renaissance. Working together both disciplines in collaboration endeavor to visually communicate knowledge about specimens being portrayed. Accurate representation of characteristics of species, details contained within each specimen's taxonomy, and other noticeable features about subjects observed, all play a significant role in helping to identify qualities about subjects portrayed in a scientific illustration.

**Abstracts: Research Poster**

## ALPHABETICAL BY STUDENT'S LAST NAME

**MIA LIN AMATO****Investigation of Environmental and Genetic Factors on Circadian Rhythm and Longevity**

Studies of longevity and behavior have been facilitated by the genetically tractable model, *Drosophila melanogaster*. Disrupted circadian rhythms are known to hinder healthspan and lifespan by deregulating the biological rhythms guiding survival behaviors such as sleeping, waking, and feeding. These stresses are associated with increased risk for conditions like cancer and neurodegeneration. Understanding how circadian biology is regulated by aging may inform novel interventions for age-related diseases. In this two-part study, we first characterize the lifespan of *D. melanogaster* under an extended light/dark cycle to determine whether dysregulated circadian rhythms affect longevity. The second project analyzes the effect of the longevity gene, *methuselah* (*mth*), on circadian periodicity. The *mth* mutant is a hypomorph exhibiting a ~35% prolonged lifespan. While the molecular mechanisms connecting aging and circadian biology remain unclear, our studies aim to understand if *mth* might influence free-running clocks and, if so, test whether this contributes to extended life.

**SOPHIA AMRO GAZZE****Assay Analysis of the Effects of Amphetamine and Trans 2-Phenylcyclopropylamine on *Caenorhabditis elegans***

Amphetamines is a psychostimulant with addictive liability. Trans 2-Phenylcyclopropylamine (2-PCPA) is both a monoamine oxidase (MAO) inhibitor and a blocker of lysine-specific demethylase. These drugs are used therapeutically to treat attention deficit disorders and depression, respectively. At high doses though, they can cause severe side effects like psychosis. While both drugs stimulate the monoaminergic system, amphetamine increases extracellular monoamine by acting at the monoamine transporters, whereas 2-PCPA inhibits monoamine degradation by blocking the activity of MAO. In this project, we study the effects of 2-PCPA and amphetamine in the model system, *C. elegans*. Behavioral assays were performed in animals treated with increasing concentrations of amphetamine and/or 2-PCPA. We found that like amphetamine, 2-PCPA caused behavioral effects in *C. elegans*. However, 2-PCPA was less efficient than amphetamine. Interestingly, when administered together, these drugs showed an additive effect. By using mutant animals, we are testing whether 2-PCPA acts on the dopaminergic system.

**KIANNA ANCHETA****Integrating Information Literacy in a Developmental Psychology Course**

In this study, an instructor and librarian collaborated to implement instruction and assignments in a psychology course to help students build information literacy skills. Over the course of a 15-week semester, several assignments and reflections were implemented into the psychology course's structure. Article Traceback Assignments were designed to guide students through the steps of evaluating new sources of information through lateral reading techniques. At the end of the course, students completed an Issue Debate Assignment to practice viewing an issue from multiple scholarly perspectives. Students' confidence in their ability to seek good sources of information and evaluate the quality of information increased from the beginning to end of the semester. Themes in students' responses to the information literacy assignments were also identified.

**ANTHONY ANGELASTRO****Analyzing the Effects of Nisoxetine on the Dopaminergic System of *Caenorhabditis elegans* Using Swimming-Induced Paralysis Assays**

Swimming-induced paralysis (SWIP) assays have been used in *C. elegans* to analyze the behavioral effects caused by drugs that target the dopamine transporter (DAT-1). This study tests whether SWIP assays can be used to analyze the mechanism of action of nisoxetine. Nisoxetine is a selective norepinephrine transporter inhibitor that acts as a competitive inhibitor to DAT-1, preventing dopamine reuptake into the presynaptic neuron. Nisoxetine and amphetamine are used for this study at various concentrations to compare their effects on the dopaminergic system of *C. elegans* and, by extension, determine the effectiveness of SWIP concerning nisoxetine use. We demonstrate that nisoxetine induces a SWIP response in *C. elegans*. However, the percentage of SWIP is notably lower than that observed with amphetamine, suggesting that nisoxetine's inhibitory nature on DAT-1 results in less extracellular dopamine. Alternatively, amphetamine might act on targets other than DAT-1.

**ASHLEY BOSWELL****Gopher Tortoise (*Gopherus polyphemus*) 16s rDNA Gut Microbiome Analysis**

The gopher tortoise (*Gopherus polyphemus*) is a species native to Florida. Gopher tortoises dig deep burrows for shelter and are considered a keystone species due to about 350 species relying on their burrows. As a threatened species, understanding the gut microbiome of a species is essential in understanding their health and physiology. There have been no gut microbiome studies previously conducted on the gopher tortoise population in the Abacoa, a densely populated preserve located in Jupiter, FL. This research focuses on investigating the gopher tortoise gut microbiome and its immunological relevance through fecal samples. The relative abundance of each bacteria will allow for analysis of the microbial diversity between the samples and abundance of each bacteria present. This study will provide essential information in understanding the gut microbiome with respect to its immunological relevance in hopes to aid future studies to help preserve this keystone species.

**RYAN CANTRELL****Genetic and environmental conditions that regulate Dsd expression and function**

Dysfunction of insulin signaling has been linked to many metabolic and neurological disorders. Our lab has data suggesting the *Drosophila* transmembrane protein Distracted (Dsd), a paralog of human Attractin, modulates excitability of Insulin Producing Cells (IPCs) and neurons, regulating insulin release through metabotropic GABAB receptors. Additionally, strong evidence exists that Dsd translation is regulated by microRNAs (miRNA). We used western blotting to determine conditions that alter Dsd or GABAB receptor expression. We compared Dsd levels of wild type and loss of function flies to lines with miRNA predicted to target Dsd transcripts. 6/10 miRNAs showed an increase in Dsd, but levels varied among trials. Microscopy confirmed inhibition of individual miRNA caused Dsd upregulation in 20–30% of animals suggesting that multiple miRNAs regulate Dsd expression. We are currently determining how starvation, neuronal excitation, and cellular stress affect Dsd. Finally, we are assessing the effects of Dsd on GABAB2 receptor levels.

**GISSELLE CHAVEZ****Examining the Presence of Ranavirus in Southeastern Florida Preserves**

Gopher tortoises are in a prolonged battle between man and nature, so much that they're identified as threatened in North America. Due to the influx of urbanization, the gopher tortoises' population has declined, forcing them to relocate into preserves. Unfortunately, preserves imposed another problem of increasing pathogenic diseases due to maintenance and overcrowding. The complexity of pathogens is immense, meaning its unknown what pathogens are present in populations such as the Abacoa Greenway and Florida Atlantic University Boca Raton preserve. To understand pathogens, Ranavirus was examined using molecular genetic techniques to isolate the Ranavirus-specific MCP gene to determine its presence in blood samples. Results showed that both populations had no Ranavirus from 2009–2022. These findings narrowed down the scale of pathogens present in preserves. Future directions are to experiment on a larger sample size and in different South Florida preserves to obtain a more comprehensive survey of the pathogen's presence.

**IANIS CIOLACU****Identification of effective immunotherapy targets on the triple-negative breast cancer cell surface**

Triple-negative breast cancer (TNBC) is the most aggressive form of breast cancer. Pembrolizumab, the only FDA-approved TNBC immunotherapy, targets the checkpoint regulator PD-L1 on TNBC cells, but is only effective in cells with high levels of PD-L1. Few other immune checkpoint regulators are drug development targets. Using an in vivo screen, we identified over 50 candidate immunotherapy targets on a mouse TNBC cell surface. Here, we aim to validate the roles of the leptin and erythropoietin receptors. We will knockdown expression of these receptors separately in mouse TNBC cells using RNA-interference, and confirm loss of receptor expression by InCell Western. We will then determine the effects of receptor knockdown on cell proliferation, and the ability of cytotoxic T lymphocytes to eliminate these cells. These studies will validate the roles of the leptin and erythropoietin receptors in the immune checkpoint and help to determine their effectiveness as immunotherapeutic targets in TNBC.

**DARA COHN****Repeating information leads to increased truth perception**

The illusory truth effect is a phenomenon in psychology where the more things are repeated, the more they are perceived as true. We aimed to replicate this effect and examine whether increasing the number of repetitions would continue to increase truth perceptions. College students saw true and false versions of trivia statements up to three times. For the final time, participants rated the perceived truthfulness of the statement. Statements that participants saw twice were rated as more true than statements they saw once, but there was not a significant difference in truth ratings between statements seen twice and three times. This study replicated the strength of the illusory truth effect, but also found that size of the effect decreases across exposures.

**JOURDAN DEFRAIN****Characterizing expression of the immune receptor, IL-1R1, within the dorsal raphe nucleus of males and females**

Inflammation is increasingly linked to development of psychiatric conditions, such as depression. Serotonin is a key neurotransmitter found to play a role in the development of depression. Known sex differences in the serotonin system exist, likely contributing to differences in psychiatric disorder presentation and diagnosis. A subset of serotonin neurons supports communication between the peripheral immune and the brain, although the details of this are poorly understood. A better understanding of the distribution of these neurons will help elucidate the comorbidity observed between immune system dysfunction and psychiatric disorders. My research examines the distribution of neurons capable of responding to inflammation within a brain region called the dorsal raphe nucleus (DRN), which is where serotonergic neurons reside. However, serotonin neurons are a heterogenous population, meaning they might also be capable of releasing additional neurotransmitters. My assessment examines the distribution of serotonin, dopamine, glutamate, and GABA expressing neurons within the DRN and their expression of the immune receptor, IL-1R1.

**ROSELYN DIAZ****The Formation of False Memories and Actor Changes**

False memories, specific to this study, form when individuals remember the wrong person having performed a particular action. The main goal of this project was to determine how changes in actor gender, age, and/or both affect the establishment of false memories. The first session is characterized as encoding and the second is known as retrieval. For both sessions, each performed a week apart, participants viewed various events involving actors performing different actions. Computerized testing was performed after both sessions. Based on previous studies, we expected the likelihood of false recollection to increase among participants when the gender and age of the actor remained the same. This study is one of the few that has studied event memory in relation to changes in actor gender and/or age, which allows for new information regarding the effects of actor gender and age on memory.

**CLAUDIA DIAZ GONZALEZ****Multicultural Historical Development of Cataract Surgery**

Modern scientific medicine, sometimes called "Western medicine," resulted from historical, intercultural contacts and the spread of medical treatments through migration, adaptation, and incorporation of different cultures' medical practices. In my research, I trace the diverse cultural roots and historical contacts that led to the development of modern medicine, using modern cataract surgery as a case study. By tracing the historical development of cataract surgery and how different cultures contributed to the improvement of this procedure, I show that my results challenge the term "western medicine," because non-western cultures contributed to modern medicine. To subsume this diverse, multicultural medical history under the term "western medicine" renders non-western contributions invisible. I highlight the multicultural historical development of cataract surgery as a significant step in counteracting the invisibility of other cultures' contributions to modern medicine.

**ELLEN DIEZ****Detection of Eimeria Parasites in Gopherus polyphemus of Abacoa, FL**

The gopher tortoise (*Gopherus polyphemus*) is a keystone species that resides in the southeastern United States, including the state of Florida. Gopher tortoises dig burrows that provide shelter for over 300 other species. Various intestinal parasites, namely those in the Eimeria genus, have been identified as a major threat to gopher tortoises. There is a lack of information regarding the prevalence of these pathogenic threats to gopher tortoises in South Florida, emphasizing the importance of further research. To investigate the presence or absence of Eimeria in gopher tortoises of Abacoa, FL, DNA was isolated from fecal samples, followed by amplification of the pathogen 18s rRNA gene using specific primers to detect the pathogen. Molecular testing confirmed the presence of Eimeria in the sample population of gopher tortoises. This information can be used to further examine possible treatment plans for the keystone species.

**TASHI DILLON****Knocking out interleukin receptor 1 decreases severity of post-ictal cortical EEG suppression in generalized tonic-clonic seizures**

Post generalized electroencephalographic suppression (PGES) following a generalized tonic-clonic seizure (GTCS) may be a biomarker for sudden unexpected death in epilepsy (SUDEP) risk. The interleukin-1 receptor (IL-1R) induces inflammatory response which may be exaggerated in epilepsy, with evidence that the release of inflammatory mediators produced by GTCSs influences epileptogenesis. Preliminary experiments use a transgenic mouse model of adult-onset, progressive epilepsy with an overexpression of brain-derived neurotrophic factor (TgBDNF) and electrode implantation for recording of controlled seizures that develop at adulthood and increase in severity/frequency until they expire. PGES prolongs with progression, with cellular loss in the nucleus pontis oralis, a brainstem arousal structure. TgBDNF mice bred with IL-1R knockout (KO) strain to determine if the course or severity of epileptogenesis changes. TgBDNF/IL-1RKO mice develop GTCSs, however the prolongation of PGES with successive seizures is abolished. This is critical for understanding the mechanisms underlying death risk associated with adult-onset epilepsy.

**JESSICA ELKINS****A Floral Inventory of Frenchman's Forest Natural Area**

Frenchman's Forest Natural Area in Palm Beach Gardens, Florida, is a 64-hectare preserve owned and managed by the Palm Beach County Department of Environmental Resources Management. This preserve includes diverse ecosystems, including scrub flatwoods, pine flatwoods, wet flatwoods, and swamps. In order to gain a more informed scope of the area's biodiversity, I conducted a floral inventory. I found that most of the plant species I documented in the preserve are native to Florida; however, there is a great deal of introduced and invasive species, making up around 30% of the species. The main goal of this study is to provide a starting point for future researchers interested in the biodiversity of this area.

**LUNA FORERO****Optimizing Group Learning Contexts for Underrepresented Students in STEM**

Within the science, technology, engineering, and math (STEM) fields, underrepresented women and ethnic minorities can experience a psychological phenomenon known as stereotype threat. Manipulation of intergroup minority/majority interactions prompts unique occurrences of self-stereotyping, diminished self-esteem, and task-avoidant behaviors. Within STEM classroom settings, stereotype threat could be problematic for learning processes and patterns. In the present research, underrepresented students (URS) studying neuroscience-related material will be organized into URS majority or minority groups. Through pre- and post-task self-surveys, participant group interactions and stress levels will be monitored. Quantitative measures of body temperature, heart rate, and brain activity will also help elucidate group cohesion and learning. It is hypothesized that URS female-majority groups will exhibit better learning patterns for neuroscience-related material and better group cohesion as compared to URS female-minority groups.

**EVANGELINE GEORGE****Forms of Mental Health Stigma Affecting Treatment and Help-Seeking in the Indian Population**

With the onset of the Coronavirus pandemic, awareness of mental health and the mental health crisis increased sharply on the global stage. In some countries, strides have been made to understand and combat barriers that people encounter in recognizing and treating mental health problems. Other countries have faced difficulties in this, including India. India has encountered particular challenges in the acceptance and expansion of mental health awareness and treatment. One driving factor may be stigma. Stigma has been found to vary in different cultures as it is influenced by the cultural climate of the community. When there are high levels of stigma, there is typically less identification and treatment of mental health concerns. Stigma is vital to understand and combat in the cultural setting. This poster will explore the role of Indian culture on stigma and its effects on treatment.

**DIMITRIOS GIAKOURAS****Uncovering the Gopher Tortoise Gut Microbiome**

The Florida gopher tortoise (*Gopherus polyphemus*) is a keystone species with over 350 species relying on it and its burrows for survival. Over the past century, however, the gopher tortoise population has decreased by ~80%, along with a ~90% habitat decline. Many enteric and respiratory pathogens are currently under investigation as potential threats to the gopher tortoise population. It has been well established in other vertebrate taxa that the immune system is heavily related to the gut microbiome. Gut microbiota have been implicated not only in immune function, but also in neurological function. Unfortunately, the reptilian gut microbiome is understudied. This study investigated the microbial makeup of the gopher tortoise gut. DNA from (n = 16) gopher tortoise fecal samples was extracted for microbiome analysis. Our findings provide insight into the microbiome and health of this species and will contribute to conservation efforts

**BERNARD HARRIGAN****Florida Environmental Policies and their Implications for Social Justice**

American society is currently facing a fracturing that will likely have immense consequences for future generations. In Florida, racial and sexual identity justice, healthcare equity, and climate change are at the forefront of news campaigns leveraging swift policy-making opportunities to push political agendas. Racial disparities magnified by current climate policies can leave many minorities and BIPOC communities ill-prepared for future inevitable climate disasters. The State of Florida has a closing window of opportunity and responsibility to address urban climate policies for climate mitigation and resilience as a conduit for expanded social justice strategies. Floridians, regardless of immigration status, lead their lives with hopes that they would have access to clean environmental necessities like water, air, and food and structural security with sustainable continuity. Florida has historically ebbed and flowed its way through environmental sustainability, and resulting policies and priorities continue to impact minority communities at an alarmingly detrimental state.

**MELANIE HART****Serotonergic hyperinnervation modifies cocaine responses in mice expressing the psychiatric disorder-associated DAT Val559 variant**

This project aimed to investigate the impact of haloperidol on nerve conduction in *Lumbricus terrestris*. Earthworms were exposed acutely or chronically to a solution of saline, DMSO, or haloperidol. Electrophysiological techniques were employed using the PicoScope to collect neural data in each of the groups. The average threshold and conduction velocity decreased when exposed to haloperidol for both chronic and acute exposure. Conduction velocity was generally lower in the lateral giant fibers (LGFs) than in the median giant fiber (MGF) for both chronic and acute exposure to saline, DMSO, and haloperidol. The threshold was generally greater in the LGF than in the MGF for all solution and exposure groups. The results of this experiment can provide insight into the function of haloperidol on neuronal activity in an earthworm specimen. The decrease in conduction velocity and threshold in the experimental groups demonstrates that haloperidol has a depressant effect on neuronal activity.

**HELEN HONG****The Prevalence of The Novel Species of Anaplasma: Candidatus Anaplasma testudines in the Gopher polyphemus Southern Florida's Population**

The gopher tortoise is an ecologically important keystone species whose burrows provide shelter for other organisms and increase plant biodiversity. However, gopher tortoises are threatened and protected in Florida as their populations are low due to numerous reasons, such as habitat loss, overcrowding on preserves, and various diseases. The objective of this study is to investigate the presence of the newly emerged blood pathogen, *Candidatus Anaplasma Anaplasma* in the Southern Florida population. This candidate pathogen belongs to the *Anaplasma* genus and *Anaplasmataceae* family, which has been studied in relation to the clinical symptoms of mild to extreme anemia. The species we are interested in studying, *Candidatus Anaplasma testudinis*, has been discovered in both gopher tortoises and other reptiles. These findings will help us characterize the pathogen threats to gopher tortoises in Southern Florida and contribute to the ongoing anemia research in this species.

**HIBAH HUSSAIN****Non pharmacological intervention methods for Neonatal Abstinence Syndrome**

Neonatal abstinence syndrome (NAS) is an issue for newborn babies who have been exposed to certain drugs in utero. Due to the rise in NAS cases in the United States, it is important to understand the various therapy options available. In this thesis I will argue that, while pharmacotherapy is the most widely used option, non-pharmacological intervention (NPI) methods may provide better results. For instance, studies have shown that NPIs are effective in reducing the presence of symptoms, as well as reducing both hospital costs and the length of stay for NAS patients. However, there is an identified gap in NPI research, and I will here argue that this should be addressed.

**NOOR IBRAHIM****CRISPR Editing in The Retina of Postnatal Mice**

The function of proteins in biological systems has been studied through genetic manipulation, specifically through knockouts (KOs) and knock-ins (KIs). Traditional methods such as the Cre-lox p method are time-consuming and resource-intensive. We are developing an alternative method to create partial KO mice using plasmids carrying the Cas9 gene to study essential proteins in the function of cones. Our approach involves creating a partial KO of Nrl, a transcription factor necessary for rod cell development, creating cone-like cells from rod precursors. We then partially KO specific proteins vital in cone cells, such as mGluR6 and LRIT3. Our goal is to determine the effectiveness of this method in studying protein function by IHC to validate the partial KO. If successful, this method will save valuable time and resources and accelerate discoveries and advancements in the field, leading to a deeper understanding of genetic retinal diseases and developing new therapies.

**MARYAM IMRAN****Development of a cerebrospinal fluid (CSF) shunt device for the treatment of hydrocephalus in point-of-care (POC) settings**

Cerebrospinal fluid (CSF) is fluid in the brain ventricles responsible for maintaining the overall homeostasis of the brain. A buildup of CSF can result in the neurological condition of hydrocephalus. Shunt devices are used to treat hydrocephalus, yet are costly and unavailable in point-of-care settings (POC). This project aimed to develop a functioning shunt device for POC settings by testing numerous designs and materials to prevent shunt malfunctions and create a cost-effective, and thus more widely-available, option. Shunt designs were created using CAD and 3D printing and tested in a model setup of brain ventricles. A circular prototype has been developed with an electrically controlled, ball-in-cone feature. A flow sensor, connected to the prototype, provides flow rate. Preliminary data show that the prototype is able to yield experimental CSF flow rates that approach that of a healthy individual. More testing will help to further optimize it for eventual clinical application.

**RACHEL KAVALAKATT****Wearable Biomedical Device for the Prevention, Treatment, and Management of Carpal Tunnel Syndrome**

Carpal tunnel syndrome (CTS), a peripheral neuropathy affecting over 62% of pregnant women annually, is caused by compression of the median nerve and characterized by pain weakness in the wrist and hands. This inhibits range of motion and prevents patients from doing daily repetitive tasks. Current solutions include wrist splinting, which is restrictive and bulky, or invasive procedures including steroid injections or carpal tunnel release surgery, which carry the risk of complications. I designed a non-bulky, cosmetically appealing wearable biofeedback device composed of a wristband and ring set that prompts wearers to maintain a neutral wrist position while allowing a comfortable range of motion. My design collects inertial data and provides instantaneous biofeedback signals when patients bend their wrists into positions harmful to their CTS. This product improves patient quality of life by allowing freedom of movement along with accurate detection of harmful wrist movement for real-time management of CTS.

**TRIP KEEFAUVER****The Bringer of Rain: The Crested Lupid**

The Crested Lupid is an amphibian hybrid of other semi-aquatic and reptilian creatures. The two primary animals the Lupid shares biological traits and physical appearances with are the elusive Axolotl and the adaptable Chameleon, traits which are also present in the Lupid's personality. The Lupid's unique biology and elusive nature also tie it back to ancient myth, where the ancients interpreted its presence as a sign of coming rain, which the Lupid enjoys greatly. Lupids are sociable creatures, especially with other Lupids. They have been observed using various physical methods of communication with each other and have been observed to be capable of having fun, such as playing in the rain.

**MARLI KNOX****Tracing Direct Neuronal Projections from the Mouse Perirhinal Cortex to the Hippocampus**

To date, the current published body of literature has conflicting information as to whether the mouse perirhinal cortex (PRh), and more specifically the rostral deep layers (IV-VI), send direct projections to the dorsal CA1 region of the hippocampus. Our lab has previously published many studies in which the circuitry underlying memory was manipulated. The conclusions of these studies rely on the notion that the manipulations performed acted on the direct projections from the PRh to the CA1, as opposed to the indirect projections through entorhinal cortex. This study aimed to trace the projections from PRh to CA1 in the specific regions that our previous studies had targeted for pharmacologic and chemogenetic manipulations. Light-sheet microscopy is a powerful and valuable tool that permits the tracing of neuronal populations and all projections. Therefore, we injected a retrograde tracing virus into the dorsal CA1 region of the mouse hippocampus and imaged whole brains using light sheet microscopy to investigate the direct and indirect projections from PRh to CA1. Our findings support the previous literature that suggest that the PRh sends projections to the CA1 of dorsal hippocampus directly and indirectly via neighboring regions.

**KEEDON LEWIS****Molecular detection of an unidentified Hepatozoon species in South Florida Gopher Tortoises (*Gopherus Polyphemus*)**

Gopher tortoise (*Gopherus polyphemus*) populations have been in decline throughout their habitat range for the last few decades due to several environmental and health factors. Recently, high levels of an unidentified Hepatozoon parasite have been found in the blood of several gopher tortoise populations in South Florida. However, the exact species of the Hepatozoon and their effects on tortoise health are currently unknown. The goal of this study is to identify the species of the Hepatozoon parasite using a molecular approach. To do so, we used polymerase chain reaction (PCR) with primers specific to Hepatozoon to target and amplify a fragment of the Hepatozoon 18s rRNA gene. A fragment of 650 bp was sequenced and compared with sequences from previously-documented Hepatozoon species. Doing so will allow for a further characterization of Hepatozoon parasites and a better understanding of the parasites infecting the gopher tortoises in South Florida.

**KATE MAIER****Investigating *Drosophila* leg kinematics with an automated behavioral tracking system**

Responding to dynamic environmental stimuli, animals quickly adapt and optimize walking behaviors to conform to goal-appropriate locomotive states. However, the precise mechanisms by which animals' nervous systems regulate these essential movements are largely a mystery, resulting in insufficient courses of action for spinal cord injuries, neurodegenerative diseases and disorders, and prosthetic limb fit and design. With the help of an unparalleled sophisticated genetic toolkit, the fruit fly (*Drosophila melanogaster*) serves as a useful model system to investigate neuronal control of walking behavior. Thus, analyzing fruit-fly behaviors during activation of locomotion-inducing neurons can facilitate novel treatments. In this study, we developed an automated, multi-camera 3D pose tracking system that precisely quantifies fruit fly joint positions and angles with markerless pose estimation software. Further, we evaluated the effectiveness of the tracking system by performing kinematic analysis of side-specific turning during optogenetic activation of P9 neurons.



**ANUSHKA MANDALAPU****Investigating Neuronal Mechanisms of Backward Walking in *Drosophila melanogaster*.**

Walking animals typically step backward to avoid a collision or potential threat in their way. Previous works in *Drosophila* have identified a set of descending neurons responsible for backward walking, the “moonwalker” descending neurons (MDN). While the downstream pathways of MDN have been investigated, less is known about the function of their synaptic inputs. Using the recent fly brain connectome, we first mapped all the major MDN presynaptic partners. Among them, we discovered a pair of descending neurons that morphologically resemble MDN, yet whose somas are located more laterally in the brain – hence called MDN-L. Using a combination of optogenetics and behavioral analysis, our (preliminary) data suggests a role of MDN-L in backward walking. Our work aims to understand the specific role of MDN-L in *Drosophila* locomotion, and how it works with MDN to cause backward walking specifically.

**ADDISON MANOFSKY****Genotyping Transposable Element Variants In Chronic Fatigue Syndrome Using Whole-Genome Sequencing**

Change later???? study investigated whether there exist variations in the presentation of obsessive-compulsive disorder symptomatology across ethnic boundaries and, if so, what these differences are. Padua Inventory and Disgust Emotion Scale scores were collected from Asian-American, Caucasian, and Hispanic individuals. The results showed that the Asian-American and Hispanic groups both had significantly higher mean obsessive-compulsive symptom and trait disgust scores than the Caucasian group; this difference was notably greatest on the Contamination/Washing and the Checking symptom subscales. Additionally, Asian-American obsessive-compulsive total scores were significantly higher than Hispanic scores. These findings support the existing literature and suggest that the overall severity and pattern of obsessive-compulsive symptoms varies by ethnicity, with Asian-American and Hispanic groups displaying higher scores than Caucasian groups.

**MICHAEL MCNEILL****Supermodel of the World: How RuPaul and RuPaul's Drag Race Forged a Queer Performance Empire**

The art of drag, once looked down upon in society and criminalized for many years, has seen a surge in popularity and is celebrated and welcomed internationally. RuPaul and her Emmy-award-winning television franchise RuPaul's Drag Race have created a new industry and career path for what was once seen as a menace to society and was unwanted for its challenges against cis-gendered and heterosexual norms. Changing the media industry and political landscape for LGBTQ+ people, RuPaul and her show have uplifted queer performers by providing a platform to show off their talents and opportunities to make money they otherwise would not have been able to. Despite the backlash from non-supporters, contestants have been able to turn their television fame into large fanbases, international spin-offs, and financially successful cosmetic, media, and hospitality industries.

**NADIA MIRANDA-SIFUENTES****The Effect of Doxorubicin and Sulindac Drug Combination on Lung and Breast Cancer Cells**

The chemotherapy drug Doxorubicin (Dox) is widely used to treat cancers but is associated with organ toxicity due to elevated reactive oxygen species production causing oxidative stress. Our lab has shown that the non-steroidal anti-inflammatory drug, Sulindac, enhances cancer cell death in the presence of an oxidative agent via its cox-independent mechanisms. We predict that Sulindac will enhance the killing of cancer cells while protecting normal cells from Dox toxicity through modulation of mitochondrial function. In this study, we tested low doses of Dox and Sulindac on lung and breast cancer cell lines. The results showed enhanced killing of lung cancer cells and low-grade tumorigenic breast cancer cells. In contrast, the invasive breast cancer cells exhibited proportionally less cell death. Our findings suggest that Sulindac may significantly treat early-stage breast and lung cancer. These studies present both a reduction in tumor burden and protection against cardiotoxicity in cancer patients.

**HANNAH MNAYARJI****Floral Inventory and Historical Analysis of the FAU Preserve**

Land development and changes in land management can have drastic effects on vegetation patterns and species diversity in natural areas. The ecological site at the Boca Raton campus of Florida Atlantic University, a 0.3 km<sup>2</sup> natural preserve site, is an excellent case study in the effects of land management. In 1990, FAU ecologist Daniel Austin published a floral inventory documenting the plant species found at the FAU preserve site. In an analysis of species change between the initial 1990 study and modern plant populations, a second floral inventory was conducted in this research using a quadrat sampling method. A focus on native to nonnative plant ratio, water drainage patterns, and vegetation patterns were employed during this study. Results thus far indicate a decrease in biodiversity and increase in percentage of invasive species compared to the original survey. A comparison of the 1990 and 2023 surveys reflect land management of the preserve site, as well as general ecological trends observed in coastal South Florida over the past three decades.

**JAZMIN MORRIS****Maternal Sensitivity in the Context of Temperamental Fear**

Maternal sensitivity is a mother's ability to respond to their infant's behavioral cues, which can have either beneficial effects on infants or in some cases may lead to increased undesirable behaviors. The main goal of this study is to see how maternal sensitivity correlates with temperamental fear and affects infants in distressing and non-distressing contexts at 6 and 8 months. Mothers/infant pairs were video recorded during an interaction and three fear-eliciting stimuli, and both of their behaviors were later coded for maternal sensitivity and infant fear. Preliminary results show that an increase in maternal sensitivity is associated with an increase in infant fear, and maternal sensitivity has more prominent risk effects in distressing contexts. Learning more about maternal sensitivity's relationship with infant temperamental fear can help us understand the influence of mother and child interactions on one another.

**NARESH PADMANABAN****Quantifying Behaviors in Surface and Cave *Astyanax mexicanus* Populations to Determine Stress-Determinant Behaviors**

Stress responses are reactions to aversive cues. While stress behaviors manifest themselves differentially among animals, little is known about how these behaviors are shaped. *Astyanax mexicanus* has emerged as a model for trait variation. *A. mexicanus* exists as two morphs, surface fish and multiple blind cavefish. Whereas surface fish have high stress, cavefish are resilient. A detailed understanding of what parameters differ among the morphs remains elusive. To address this, videos of surface and cavefish in a stress assay are recorded, and several normal and stress-associated behaviors tracked. We hypothesize that some behaviors will associate with stress differences, while other will not. It could also be that stress-like behaviors differ between surface and cavefish, suggesting that stress behaviors could be related genetically. Preliminary data reveals that the surface variant spends more time in the top of the tank and exhibit freezing less frequently when compared to their cave counterparts.

**ALEXANDRA PAPA****Structural Basis for Estrogen Receptor Antagonism by a New Ligand Class**

Almost 80% of breast cancer cases are caused by tumor cells that express Estrogen Receptor- $\alpha$  (ER). When bound to estradiol, ER adopts an active conformation and drives cancer growth. However, when bound to an antagonist, ER adopts a different conformation and inhibits cell growth. The unique sidechains of breast cancer drugs like tamoxifen, inactivate the ER ligand-binding domain (LBD) by directly repositioning helix-12. We discovered a class of ER ligands that suppress proliferation through indirect antagonism i.e., dislocating helix-11, and destabilizing helix-12 without a prototypical sidechain. Here, we solved crystal structures of the ER LBD bound to a series of compounds with a 3-dimensional scaffold and distinct helix-11-directed sidechains and compared these structures to their activities in cell-based assays, including cell proliferation. We found that these compounds engaged in indirect antagonism of ER as their primary structural mechanism of action, which underlies their structure-activity relationships in breast cancer cells.

**ARGIA PAPAS****The Prevalence of Upper Respiratory Tract Disease in the Abacoa Gopher Tortoise Population**

It is important to study gopher tortoises because without human intervention, extinction is very possible. Upper Respiratory Tract Disease, or URTD, is a highly contagious disease and has been cited as a contributing reason for the decline in the gopher tortoise population. Common symptoms of URTD include nasal discharge, ocular discharge, edema of and around the eyelids, and conjunctivitis. Previous research established the bacterium *Mycoplasma agassizii* as a major cause of URTD in gopher tortoises. However, past studies were based on antibody titers, which indicate past exposure, not necessarily active infections. The aim of this study is to obtain genetic data regarding the current prevalence of *Mycoplasma agassizii* within the gopher tortoise population in Abacoa, located in South Florida. PCR for the 16S rRNA gene from *Mycoplasma* was performed using mucosa swabs. The prevalence and genetic data presented will help us understand the diseases facing the threatened gopher tortoise population.

**BRIANNA PARSONS****COVID-19 Pandemic Aftermath: How the Labor Force Participation was Affected**

Labor force participation is a critical macroeconomic indicator related to the health of the overall economy. Between January 2020 and January 2022, the labor force participation rate dropped significantly amongst all ethnic groups. After April 2022, this measure began to climb across all groups but abnormal spikes in data continue to persist. Changes in the labor force participation rates have been uneven across the demographic groups, including race, gender and age. In this paper, we review the adverse changes in the US labor force participation rate and their unequal effect on the various demographic segments.

**AVANTHI PUVVALA****Investigating the Mechanism behind RORa's Repression of IFN- $\gamma$** 

Interferon-gamma (IFN- $\gamma$ ) is a cytokine essential in the regulation of both innate and adaptive immunity. Upon activation CD8+ T cells produce and secrete IFN- $\gamma$  as part of the adaptive immune response. Previous studies into the role of the nuclear receptor Retinoic, an acid-receptor related orphan receptor alpha (RORa), in the immune system found IFN- $\gamma$  production in CD8+ T cell to be enhanced in RORa deficient mice. However, the exact mechanism governing this phenotype remains elusive. We have previously found that overexpression of RORa in CD8+ T cells represses IFN- $\gamma$  production as such we hypothesize that RORa may transcriptionally regulate IFN- $\gamma$ . To identify this mechanism, we will create various truncated RORa constructs to assess its activity in regulating IFN- $\gamma$  through biochemical and molecular immunological techniques, including Luciferase assays and phenotypic analysis via Flow Cytometry. Through these studies we aim to better understand the mechanism behind RORa-dependent repression of IFN- $\gamma$ .

**DANIEL PERAMUNE****Sequencing the Toll-Like Receptor 4 Gene from *Gopherus polyphemus* and Analysis of Genetic Variation Within the Abacoa Preserve Population**

Gram-negative bacteria like *Mycoplasma* spp. and *Anaplasma* spp. have been documented to infect the threatened *Gopherus polyphemus* populations. The toll-like receptor 4 (TLR4) gene plays an essential role in the defense against such infections. TLR4 aids in identifying gram-negative bacteria and initiating the downstream pathway that leads to an immune response. However, the TLR4 gene of the gopher tortoise has yet to be sequenced. I designed primers to the TLR4 exons based on the consensus sequence of closely related species *Gopherus flavomarginatus* and *Gopherus evgoodei*. PCR reactions were performed on genomic DNA isolated from the nucleated blood of the gopher tortoise, and clear single bands were obtained. The TLR4 sequence of the gopher tortoise, obtained by Sanger DNA sequencing, will be presented. Additionally, bioinformatics will be used to demonstrate the presence or absence of genetic variation in the TLR4 genes of gopher tortoises from the Abacoa preserve.

**SHIVANA PERSAUD****Detecting The Intestinal Parasite *Cryptosporidium* in *G. polyphemus* within South Florida**

*Gopherus polyphemus* is a keystone species native to the southeastern United States that builds burrows providing shelter to countless commensal organisms. This species has been experiencing detrimental effects from habitat fragmentation, growth in population densities, and urbanization. Together, these factors have caused a decline in the gopher tortoise population and have the potential to contribute to the heightened threat of transmitting gastrointestinal diseases such as Cryptosporidiosis. Intestinal diseases and parasite detection within *G. polyphemus* are largely unknown due to limited research in this area. To screen for the intestinal parasite, *Cryptosporidium*, fecal samples from *G. polyphemus* were collected from a population located in Abacoa, Jupiter, Florida. DNA was extracted and PCR-amplified using primers specific to the 18s rRNA gene from *Cryptosporidium*. Only one out of the nine (11%) samples screened appeared to have *Cryptosporidium* present. The presence of this pathogen is a potential cause for concern in addressing conservation efforts.

**KATIE POQUETTE****Effects of Ablation of Dopaminergic Neurons on Dopamine Release and Uptake in *Caenorhabditis elegans***

Amphetamine, a common psychostimulant drug, produces its effects by increasing the release of the neurotransmitter dopamine. *Caenorhabditis elegans* are known to exhibit swimming induced paralysis (SWIP) when exposed to amphetamine due to high concentrations of extracellular dopamine. In this study, we ablated the dopaminergic neurons of transgenic *C. elegans* using the optogenetic tool KillerRed to measure the impact that ablating these neurons has on *C. elegans*' SWIP behavior, which will provide insight into the role of dopaminergic neurons in dopamine release and reuptake. We hypothesize that ablating *C. elegans*' dopaminergic neurons will result in a decrease of worms exhibiting SWIP because the dead neurons will be nonfunctional, preventing dopamine release and accumulation and limiting SWIP in ablated worms. These results will provide a more comprehensive understanding of dopaminergic neurons in *C. elegans*, maximizing these animals' effectiveness as a model organism, particularly in testing drugs that impact the dopaminergic system.

**TEJAS PURIMETLA****Identifying Tethering Proteins Important for Mitochondria-Actin Interactions**

The brain consumes 20% of the total energy of the human body despite its 2% volume, and deficiencies in its energy supplies lead to brain disorders. Understanding how neurons meet their high energy demands, especially during synaptic plasticity, may help solve these challenging brain conditions. Prior research shows that mitochondria exist as stabilized compartments within dendrites, and this stabilization is accomplished via tethering to the cytoskeleton. This mitochondria-cytoskeleton tethering is likely achieved by proteins, but the specific proteins involved remain unclear. This project will determine the protein mechanisms tethering and stabilizing mitochondria in regions of high energy demand. We hypothesize that knocking down the expression of key tethering proteins will decrease the percentage of interaction between mitochondria and the actin cytoskeleton within neuronal dendrites. As mitochondrial dysfunction is implicated in neurodegenerative diseases such as Amyotrophic Lateral Sclerosis and Parkinson's, rescuing mitochondrial stability may bring us closer to curing them.

**ANDRE RAJOO****The Neuroprotective Compound Ellagic Acid Reduces Oxidative Stress and Behavioral Changes Caused by Amphetamine**

Previous data showed that *C. elegans* can be used as model to study the physiological and behavioral effects caused by drugs of abuse, such as amphetamine (AMPH). When acutely exposed to AMPH, *C. elegans* show a unique behavior known as SWIP (Swimming Induced Paralysis), and previous data demonstrated that AMPH-induced SWIP is mediated by dopaminergic proteins. Here, we investigated whether AMPH induces oxidative stress in *C. elegans* and particularly in the dopaminergic neurons. Confocal microscopy was used to collect immunofluorescent images from *C. elegans* pre-treated with CellROX Orange, a dye that detects reactive oxidative species (ROS). After chronic AMPH exposure during embryogenesis, young-adult animals exhibited a significant increase in ROS in the whole body. However, when AMPH was combined with the ROS scavenging polyphenol ellagic acid, the AMPH-induced increase in ROS was significantly reduced. Parallel behavioral experiments showed that ellagic acid attenuated the long-term AMPH-induced behavioral effects observed with SWIP.

**ALEX REBURN****Sea Turtle Strandings Understood Through Data Analysis**

In the past few years, there have been growing interest in the conservation of sea turtles due to the increase of turtles being stranded on beaches throughout the world. We study sea turtle strandings in Florida to find possible reasons for the increase in these strandings. We use the Florida Fish and Wildlife Conservation Commission database on sea turtle strandings, as well as their *Karenia* braves dataset and the NOAA's storm database. We see that there are many noticeable reasons for the increase in sea turtle strandings. Among the primary reasons, increased human encroachment in turtle nesting zones and *Karenia brevis* or red algae are significant. Each of turtle species (Green, Loggerhead, and Kemp's Ridley) are differently affected by these factors.

**LAUREN REYNOLDS****Therapy in a Click: School-Based Tele-Mental Health Solution**

During the COVID-19 pandemic in 2020, three million U.S. adolescents had serious thoughts of suicide and there was a 31% increase in mental-health related emergency department. Despite this prevalence, mental healthcare is remarkably inaccessible. The state of Florida was ranked 49th in accessibility to mental healthcare, with one hour of therapy costing from \$65-\$250. Nearly half of all youth diagnosed with a mental health disorder didn't receive treatment. Many barriers exist to discourage those needing help from receiving it, only worsening the ongoing mental health crisis. Therapy in a Click will connect high-school students to mental healthcare serviced via virtual therapy sessions on school-issued laptops. Since the COVID-19 pandemic, Palm Beach County School District has provided every student with a portable laptop for them to take home. The services provided by Therapy in a Click will allow students to reach a therapist or mental health professional from the comfort of their own home, allowing the facilitation of meaningful tools to help to an underserved and necessary population.

**MARIAM RIZVI****Henna for Hope: Fighting to Improve Female Literacy in South Asia**

A current educational crisis exists in South Asia with women and young girls experiencing the greatest barriers in pursuit of education. Girls' education contains a transformative power with the potential to break the cycle of poverty, provide women the voice to fight against injustices, and promote equity of entry into higher-level education and the workforce. Henna design is a semi-permanent tattoo made from a natural dye that can be applied to the skin. It is a cultural art representative of wisdom and good health, but there has been a lost understanding of its historical context and cultural significance in the West. Henna for Hope funds education programs in South Asia through profits earned from henna design services provided in South Florida. We intend to help break the cycle of inadequate education for South Asian women through the intersection of art and humanity, one henna design at a time.

**GABRIELLE RUIZ****Care to Help Pet Sitting™**

Forty percent of pets in the United States receive annual veterinary care, leaving 60% of pets without the proper care needed to maintain their quality of life. Care to Help Pet Sitting addresses this problem in the pet care industry by offering transportation for your pet to and from important appointments. Our trained sitters will accompany your pet during their medical appointments to take notes and keep you in the know. To make providing care for your pet even easier, we provide a wide range of in-home services, including "per task" visits where we can assist you in any situation you may need, such as medicating your pet. Our mission is to provide aid for your animals through reliable at-home care and efficient transportation to make your lives and the lives of your pets easier.

**JAMIE SABAC****Detecting Helicobacter Infection In Gopher Tortoises of South Florida**

Gopher Tortoises (*Gopherus polyphemus*) are an important keystone species being threatened by Upper Respiratory Tract Disease (URTD). Mycoplasma bacteria was a common bacterial pathogen causing URTD symptoms, until a recent discovery of a Helicobacter bacteria. The Abacoa population in Jupiter, Florida experience URTD symptoms but the pathogen responsible for their infection is still being investigated. To determine if the identity of the pathogen is Helicobacter species, blood samples were screened using PCR amplification with two published primers targeting different genes, 16s rRNA and 60kDA chaperonin. Screening of 14 tortoises revealed no positive results. Possible interpretations could be: 1) there is no current Helicobacter infection of these tortoises (true negative); 2) Helicobacter DNA is not detected in blood, but is present in other tissues (false negative); or 3) the PCR protocol is not effective (false negative). Further experiments must be conducted to learn more about the pathogen threats facing gopher tortoises.

**MARK SADEK****Bee Venom Therapy - A Potential Treatment Option for Diseases and Chronic Illnesses**

The potential that Honeybees hold to help treat or even cure chronic illnesses should not be overlooked. The venom from Honeybees (*Apis mellifera*) contains specific enzymes and amino acids that can greatly affect different ailments. There has been research done in both in vivo and in vitro environments to determine if a direct bee sting or some type of injectable form of the venom can potentially treat several complications. There is an ongoing debate of whether it is morally acceptable for bee venom to be injected in the testing process of developing a plausible treatment option. With properties such as anti- protozoan, anti-inflammatory and anti-cancer in it, the revolutionary discoveries that can come from bee venom therapy are endless.

**STEVEN SHATKHIN****The antipsychotic sulpiride rescues only select behavioral phenotypes in DAT Val559 mice**

Dopaminergic dysfunction has been implicated in multiple neuropsychiatric disorders. The dopamine transporter (DAT) is responsible for the reuptake of synaptic dopamine, and mutations in DAT have been identified in subjects with autism spectrum disorder (ASD) and attention-deficit/hyperactivity disorder (ADHD). One such mutation, the DAT Val559 substitution, drives aberrant dopamine efflux and leads to sex-biased alterations in dopamine homeostasis and behavior in DAT Val559 mice. Among the behavioral phenotypes observed are an increase in wins in the tube test, a test of social dominance, and a reduction in sociability in DAT Val559 male mice as well as aversion to light exploration in DAT Val559 females. While prior work in the lab showed that targeting dopamine D2 receptors with the antipsychotic sulpiride reversed cognitive deficits in DAT Val559 mice, I have shown that sulpiride fails to impact social behaviors in DAT Val559 males and exacerbates anxiety in DAT Val559 females.

**SATVIKI SINGH****Characterizing Biodegradable Chitosan-Silver Nitrate Hydrogels to Combat Hospital Acquired Infections**

Over 50% of the chronic infections developed in hospital settings are linked to biofilm formations, with many cases being attributed to infection formation along wound and surgical sites. New drugs have been introduced to combat multidrug-resistant bacteria, including cyclic lipopeptide-4 (CLP-4). CLP-4 is incompatible with traditional modes of localized drug delivery and remains unutilized in the medical field. In this study, we developed biodegradable chitosan-silver hydrogels (CSH) for antibacterial wound dressing applications and explored their performance as drug delivery systems. The CSH presented intrinsic antibacterial activities against *Staphylococcus aureus*, which were enhanced by loading the gels with commercial antibiotics. We utilized SEM, AFM, and FTIR Spectroscopy and conducted compression testing to characterize the morphological, chemical, and mechanical properties of the CSH and optimize the antibiotic uptake and release. The results show promise for utilizing CSH in biomedical dressings and as potential delivery systems for CLP-4 to better prevent infections.

**VENKATA SOMESULA****The Effect of Rab10 Loss of Function on Hippocampal Dependent Learning and Memory**

The activity-dependent, long-lasting increase in synaptic strength is known as long-term potentiation (LTP) and has been accepted as the cellular correlate of learning and memory. Previous findings have demonstrated the persistent inactivation of the Rab10 molecule during LTP, suggesting its negative regulatory role in this process. Although disruptions of this small GTPase enhance LTP in vitro, its role in experience-dependent learning in vivo remains elusive. This project aims to test the effects of Rab10 loss of function in hippocampal learning and memory assays by using conditional Rab10 knockout (KO) mice. We hypothesize that the conditional Rab10 KO mice will have better episodic-like memory compared to their wild-type littermates and that age-dependent memory impairment can be reversed in these animals.

**OLGA ST-ONGE****Morphologies of Active Galactic Nuclei Host Galaxies Observed in Mid-Infrared Wavelengths**

Active Galactic Nuclei (AGN) are structures found in some galaxies where the central supermassive black hole accretes material from the surrounding galaxy. Galaxy mergers are the predominant theory for what triggers black hole accretion. The hypothesis tested in this study is that AGN with distorted morphologies, indicating a recent merger, would be obscured by surrounding dust. To study this, the morphologies and colors of mid-infrared (MIR) variability-selected AGN in five extragalactic fields imaged by the Hubble Space Telescope were studied. First, it was determined which galaxies were obscured by dust by examining their optical-to-MIR color indices using photometry in the R-band and at 4.5 microns. Next, HST images of these galaxies in the Rainbow catalog were examined to determine if their morphologies indicated a recent merger. Based on these results, it was determined that the obscured galaxies were no more likely to have recently undergone a merger than unobscured galaxies.

**JACK SWANK****Salary Prediction Search: How University, Concentration, Degree Level, and Cohort Year Impact Future Earnings**

Attending a certain university, getting your first job post-graduation, and many other choices influence one's career projection, but are people informed enough about these decisions? Salary transparency is shielded in our society, causing many to look for resources online to guide them. However, these resources often have little to no explanation or a range so vast that it only adds to the confusion. Therefore, this study focused on addressing these issues by staying within the boundaries of Florida and using data analytics to derive information from a handful of universities and their graduates. A "crosswalk" further enhances this information by transforming college major codes into occupation codes, which outputs job titles and their median salary. An interactive user interface presents data in a digestible manner to inform potentially life-changing choices and raise awareness.

**THANH TON****The Potential Role of H3K9 Methylation in Maintaining the Long-Term Effect of Amphetamine**

*Caenorhabditis elegans* were used to assess the involvement of histone 3 (H3) lysine 9 (K9) methyltransferase in maintaining amphetamine-induced behaviors. Treatments with amphetamine block the ability of *C. elegans* to swim in water (swimming-induced paralysis or SWIP). Adult animals treated with amphetamine during embryogenesis exhibited higher SWIP than control animals. Exposure to drugs during embryogenesis can influence how genes are expressed, potentially involving epigenetic modifications like histone methylation. As *set-25* and *met-2* are the only genes encoding for H3K9 methyltransferase in *C. elegans*, animals lacking expression of *set-25* and *met-2* were used to assess if these genes are involved in the long-term effects seen after embryonal treatment with amphetamine. Our results show that both *set-25* and *met-2* mutants are deficient of the behaviors induced by amphetamine. These results suggest that changes in methylation at H3K9 during embryonal treatments with amphetamine are required to maintain the long-lasting effects in adult animals.

**AETHER VAN HORN****Sequencing Brain-Derived Neurotrophic Factor in *Gopherus polyphemus***

Reptiles are an often-overlooked class in the biological sciences despite their untapped potential in evolutionary developmental biology, especially in studying the development of neural systems. Brain-Derived Neurotrophic Factor (BDNF) is a gene known for its role in the differentiation, development, and maintenance of neural cells, particularly in enabling synaptic plasticity. While BDNF has been heavily studied in mammals, research in other classes of life, such as reptiles, has been extremely limited. *Gopherus polyphemus* is a species of moderate-sized tortoise native to the southeast United States. It is a keystone species currently threatened by habitat destruction and predation. In this experiment, *Gopherus polyphemus* DNA was purified from blood samples and amplified to determine the full sequence of BDNF in this species. This could provide new insight into the evolution of BDNF in reptiles and specifically tortoises.

**ISABELLA VALLEJO****Linguistic Characteristics Related to Suicidality Using an Existing Data Archive of Reddit Posts**

The language that we use indicates our mental characteristics, including any psychological difficulties we may be experiencing. Thus, we may be able to detect certain psychopathological phenomena, such as suicidal ideation, from language; this has potential practical applications to detection and treatment. Review of theoretical and empirical literature suggests that certain features of language style and content are associated with the presence of suicidality. This study investigates the linguistic characteristics of Reddit posts made by a group of users that exhibited signs of suicidality (either having posted to the suicide support subreddit r/SuicideWatch or having received a positive suicidality rating from external judges) compared to a non-suicidal control group. Using the Linguistic Inquiry and Word Count (LIWC; a software tool for analyzing word use in text) and largely exploratory analyses, we investigate how profiles of language use are related to suicidality in a pre-existing dataset of Reddit posts.

**MIA VILA****Long-term Consequences of Amphetamine Use in Adolescence**

Amphetamine is a prescription psychostimulant used in the treatment of attention deficit hyperactivity disorder (ADHD). There is a wide prevalence of misuse of this drug, particularly among adolescents, to enhance focus and attention. Evidence indicates that the non-prescription use of amphetamine during adolescence can result in long term neurological and behavioral problems. The purpose of this project is to study these behavioral impairments and their underlying neurobiology, using a mouse model. Female and male mice treated with either 0.9% saline or 3 mg/kg amphetamine during adolescence will be examined for their social and emotional behaviors during adulthood. We expect amphetamine exposed mice to exhibit reduced social behaviors and, increased anxiety and impulsive-like behaviors. Postmortem analysis is expected to reveal concomitant decrease in spine density and dendritic arborization in select brain regions. These findings would warrant further research on preventative and therapeutic measures to manage adolescent-amphetamine abuse-related harm.

**KENNETH WHITE****Molecular Identification of a Hepatozoon Parasite in *Gopherus polyphemus* Populations in the Abacoa Greenway Preserve and Florida Atlantic University Ecological Preserve**

Gopher tortoises (*Gopherus polyphemus*) are a vastly understudied keystone species native to South Florida. Little is known about the microorganisms that affect their health and daily livelihood. In particular, this study concerns the genetic analysis of a particular blood parasite of the genus Hepatozoon, which was previously discovered cytologically in gopher tortoise blood samples from the Florida Atlantic University Ecological Preserve (FAUEP). DNA from thirteen gopher tortoises blood samples, taken from the FAUEP and the Abacoa Greenway Preserve (AGP), were purified and analyzed with PCR for the presence of Hepatozoon 18s rDNA. Two of the thirteen samples were positive on an agarose gel. DNA sequencing will be used to confirm the presence of Hepatozoon in these tortoises, and sequence analysis will allow us to identify the specific Hepatozoon species. These efforts will provide novel genetic data on a recently discovered microorganism that affects the health of gopher tortoises.



**ABSTRACTS**

**NIKOLAS WOLFF**

**Sequencing and Molecular Analysis of the *Gopherus polyphemus* CD40 gene in Abacoa and Boca Raton preserves.**

To counteract the threats of infectious diseases, complex organisms have evolved elaborate immune systems to fight off pathogens. To better understand the evolution of immune genes, the gopher tortoise (*Gopherus polyphemus*) has been used as a target organism. The gopher tortoise is a keystone species that maintains multiple Florida ecosystems. However, Upper Respiratory Tract Disease (URTD) has been detrimental to gopher tortoise populations. The spread of URTD led us to consider if the tortoises' CD40 gene could have been under evolutionary pressure for genetic variation that lessened URTD symptoms or infection. To characterize and analyze variations in the CD40 gene, DNA was isolated from nucleated blood samples that were collected from 18 gopher tortoises at Abacoa and Boca Raton preserves. The sixth exon of the CD40 gene was amplified using PCR and purified for DNA sequencing. Analysis of the genetic diversity of the gopher tortoise CD40 gene will be presented.

**XUE YANG**

**Sequencing and Analyzing Diversity of MHC class I Gene in South Florida Gopher Tortoise Populations**

*Gopherus polyphemus*, known as the gopher tortoise, is a threatened keystone species native to Florida. Their populations are affected by factors such as disease. MHC (major histocompatibility complex) genes are important to the immune adaptability of an organism. Studies suggest that greater genetic diversity of MHC I within a population may provide fitness advantages. The aim of this study was to assess MHC I diversity in the Abacoa and Boca Raton preserves. MHC I exon 3 gene was the target sequence. DNA was isolated from collected blood samples, amplified through PCR (polymerase chain reaction), and sequenced. MHC I sequence variations were compared within Abacoa and Boca Raton populations respectively, as well as with other populations. By targeting and sequencing MHC I exon 3 from these two south Florida gopher tortoise populations, one can better understand their immune health and susceptibility to disease.



**Harriet L. Wilkes  
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21<sup>st</sup> graduating  
class on  
**MAY 4<sup>th</sup>, 2023**

Medallion Ceremony\*

**10:00 AM**

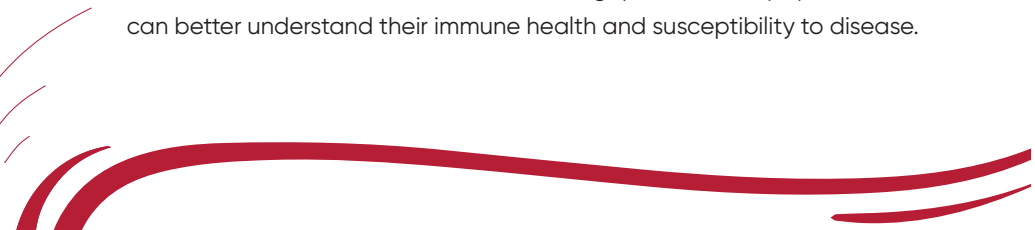
Osher Lifelong Learning Institute Complex, Auditorium  
Jupiter, FL

Commencement Ceremony\*

**5:00 PM**

Carol and Barry Kaye Performing Arts Auditorium  
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\*tickets are required for all guests



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