2025 ECU DISTINGUISHED GRADUATE FACULTY MENTOR AWARDS

DOCTORAL CATEGORY

Dr. Ariane Peralta

Biology, Thomas Harriot College of Arts & Sciences

Dr. Ariane L. Peralta, Associate Professor in the Department of Biology (BIOL) in the Thomas Harriot College of Arts & Sciences, serves as the Graduate Program Director for the Interdisciplinary Doctoral Program in Biology, Biomedicine, and Chemistry (IDPBBC). Serving in this role since 2020, Dr. Peralta has ensured the program maintains its robust cadre of graduate students, research production, and grant activity. She currently is a co-leader of a National Science Foundation (NSF) graduate training program. Her values of open and reproducible science provide students with the foundation of a strong research career, but her expectation that all will be respectful and kind is what she is valued most for by many of the students she encounters. As a co-primary investigator of the NSF traineeship program, she instills collaboration to help students learn to integrate data-science applications with community-engaged research. One of her student nominators described "her dedication to being an involved mentor was evidence through the materials she had on hand to introduce new trainees to working in her lab…" Dr. Peralta's "shared expectations" document helped this student understand the depth of the care and concern Dr. Peralta shows to her students. Another student nominator was struck by how broadly Dr. Peralta's intellectual community extends beyond her own department and laboratory. This nominator wrote about the importance of the interdisciplinary team Dr. Peralta promotes to and for her graduate students. Dr. Peralta's colleagues who supported the nomination described her consistent efforts to provide the students with research and professional development experiences. One colleague wrote "Witnessing her interactions with students makes it clear that she is effective in building collegial, trusting, and productive relationships that help students grow to their full potential." Congratulations Dr. Peralta and THANK YOU for being an ECU Pirate!

MASTER'S CATEGORY

Dr. Jake Jensen
Human Development and Family Science
College of Health and Human Performance

Dr. Jakob "Jake" Jensen, Associate Professor, Human Development and Family Science in the College of Health Science and Human Performance has mentored ECU graduate students since joining the Pirate community in 2014. While serving as Medical Family Therapy Interim Program Director for a year recently, he became more involved in the aspects of onboarding, retaining, and graduating master's and doctoral students. He demonstrates his advocacy for his students in a direct way: at least 10 times per semester she shares: "I care about you more as a person, than I do as a student, a writer, a clinician, or a researcher" with the graduate students in the ECU Marriage and Family Therapy program and they hear it. One student recently shared that he likes talking to Dr. Jensen because it's difficult to find another "guy" who will sit with him and talk about relationships and emotions. This student stated "It's more meaningful than you know." While caring deeply for his students as individuals, he also excels at providing them with the knowledge and skills they need to be successful beyond graduation. One student nominator wrote about how Dr. Jensen had her *start* the thesis process by choosing where to publish the manuscript that would result from the research. The student described as the thesis was getting finished, she could already envision the article that would be published and that ultimately led to completion of the goal. All of his student nominators expressed deep gratitude to Dr. Jensen for helping to launch their careers, while "creating a space for me to be human throughout the process." Dr. Jensen's colleagues write that not only is he an amazing committee chair and committee member for theses and dissertations, but also he's excellent at mentoring graduate assistants. His colleagues noted that nearly every year at least 1-2 students present research with him at professional conferences, often very prestigious ones. He has an outstanding record of publishing research with his graduate assistants, as well. The depth and breadth of his mentoring is impressive and the graduate students of Human Development and Family Science benefit from his dedication and commitment. THANK YOU, Dr. Jensen for supporting our students and Congratulations!

DOCTORAL DISSERTATON AWARDS
HUMANITIES AND FINE ARTS

Dr. Abigail L. Morris

Dissertation Title: "Encouraging Preventive Action by Employing Effective Rhetoric in Public Communication of the Zika Hazard and Associated Risks"
Department of English, Thomas Harriot College of Arts and Sciences
Dissertation Director: Dr. Erin Frost
https://thescholarship.ecu.edu/handle/10342/13148 https://thescholarship.ecu.edu/items/0eac2c7a-345c-4603-9cb2-ac604b341d05

Abstract
Threats from Zika and other emergent arboviruses (arthropod-borne viruses) often receive little scholarly attention across most disciplines thanks in no small part to the traditional view that most emergent disease discourse is only immediately relevant to those in medical and economic fields. The reality is that any time endemic threats pose risks to public welfare or become threats to national health and security, scholars from all fields should reevaluate how their current and developing skills and knowledge could be employed to help prevent and/or minimize negative outcomes when outbreaks seem likely. Scholars in the fields of rhetoric and technical communication have developed skills and knowledge that would render us particularly well suited to work with those in medical, economic, and public communication fields to develop or remediate tools and resources to alter potential outbreak outcomes in positive ways if we were offered or willing to claim a seat at their table. This study utilizes surveying of residents in Harlingen, Texas, regarding Zika as a springboard into research on public health communication failures as represented by technical documents designed to communicate health and safety information about Zika and validated by revision of those documents to increase their effectiveness in encouraging proactive prevention behaviors and retention of health knowledge.

LIFE SCIENCES

Dr. Taylor A. Johnson

Dissertation Title: "Discovering mechanisms during spermatogonial differentiation that prepare male germ cells for meiosis."
Department of Anatomy and Cell Biology, Brody School of Medicine
Dissertation Director: Dr. Christopher Geyer
https://thescholarship.ecu.edu/items/a5a9c929-0227-4175-aecb-bb42e3a141ea

Abstract
Spermatogenesis, the male germ cell maturation process, allows men to become and remain fertile for decades. Male fertility relies on fate decisions of different types of spermatogonia – spermatogonial stem cells maintain the germline long-term, undifferentiated progenitor spermatogonia divide and await the differentiation signal (retinoic acid, RA), and differentiating spermatogonia proceed forward into meiosis as spermatocytes to ultimately become sperm. Spermatogonial differentiation and meiotic initiation are indispensable transitions in spermatogenesis that remain poorly understood. The three studies within this dissertation, using a combination of in vivo and in vitro approaches, detail spermatogonial requirements in these two transitions. The first study (chapter two) scrutinizes and redefines a presumed dogma – the requirement of RA for the spermatogonia-to-spermatocyte (mitotic-to-meiotic) transition. The second study

(chapter three) deciphers the differential responsiveness of spermatogonia to RA in the adult testis. The third study (chapter four) introduces a novel RNA binding protein required for the commitment to and completion of spermatogonial differentiation. The collective findings from these three studies both enrich our understanding of spermatogonial biology and propose avenues for treatments that can enhance or discontinue spermatogonial differentiation.

MASTER'S THESIS AWARD
SOCIAL SCIENCES, BUSINESS, AND EDUCATION

Addison Siemon

Thesis title: "Pouring Over the Past: Interpreting Life at an 18th Century Tavern in Brunswick Town, North Carolina." Department of Anthropology, Thomas Harriot College of Arts and Sciences
Thesis Director: Dr. Charles Ewen
https://thescholarship.ecu.edu/items/1d4f2f98-6625-42ce-9bba-4cf7b1ef31be

Abstract
In 2019, the East Carolina University archaeology field school partially excavated a structure in the historical Colonial port of Brunswick Town. Through comparative research, this structure was determined to be a tavern from the mid-18th century. Although the purpose of the building had been identified, daily life at the tavern is still poorly understood. Studying the architecture and artifact assemblage using a combination of traditional and neoteric methods has illuminated new interpretations of the structure. Examination of architectural features has revealed the structure likely belonged to a Caribbean Georgian-influenced Southern Vernacular style popular at Brunswick Town. Evaluation and cross-comparison of the artifact assemblage with other Colonial tavern sites suggest the tavern represents an intermediate stage between rural and urban environments. Further analysis of the provenience may imply the tavern burned before this urbanization process could have completed due to a fire stemming from the fireplace.

LIFE SCIENCES

Jude Kinkead

Thesis title: "Investigation of Curli-Specific Proteins CsgD and CsgA Reveals a Potential Target for Neurodegenerative Therapeutics and Provides Structural Insights into the Bacterial Amyloid CsgA."
Department of Biochemistry & Molecular Biology
Brody School of Medicine, Thesis Director: Dr. John Cavanagh
https://thescholarship.ecu.edu/items/4fd22902-3cb2-422c-ad91-d3b013cb1ad9

Abstract
A growing body of evidence implicates curli-containing biofilms in the onset of eurodegenerative pathologies like Alzheimer's and Parkinson's diseases. Curli-containing biofilms are composed primarily of two bacterial amyloid proteins, CsgA and CsgB. Amyloid proteins are typically intrinsically disordered or contain intrinsically disordered regions. As a result, their native state is difficult to define due to diverse conformational sampling. In addition, these proteins are prone to misfolding and common secondary structural features provide an avenue for template-driven polymerization that results in an insoluble protein deposit rich in [beta]-sheets. We are host to an array of microorganisms, which are able to directly interact with their hosts through the gut-brain axis. The vagus nerve provides a physical connection between the gut and brain, allowing for bidirectional communication. Curli-containing biofilms produced by enteric gut bacteria like E. coli and S. Typhimurium have been shown

to promote motor impairment in mice, as well promote motor impairment and [alpha]Syn aggregation in aged Fischer 344 rats and C. elegans. In addition, the bacterial amyloid CsgA has been shown to accelerate [alpha]Syn in vitro as well as colocalize with [alpha]Syn in C. elegans and human neuroblastoma cells. Soluble oligomers of CsgA may be able to serve as a template for rapid polymerization of [alpha]Syn through a process known as cross-seeding. In addition, curli fibrils are recognized by TLR2 and may contribute to chronic low-grade inflammation characteristic of these disorders. Expression of curli fibrils is dependent upon a number of transcription factors, as well as the DnaK-DnaJ-GrpE chaperone system. Following translation of the csgDEFG-encoded proteins, the master-regulator of biofilm development, CsgD, upregulates the transcription of the csgBAC operon. CsgA and CsgB are kept soluble within the cell by CsgC and DnaK prior to periplasmic secretion through SecYEG machinery. CsgA and CsgB are kept soluble by CsgE and transported through the pore complex CsgG. As CsgA and CsgB exit the cell, they are postulated to begin adopting the [beta]-sheet rich structure similar to the mature fibril. A class of compounds have shown specificity for response regulators and have demonstrated efficacy not only in inhibiting biofilm formation but also dispersing established biofilms. The 2-aminoimidazole compounds, initially discovered in the Agelasidae family of marine sponges, contain a 2-aminoimidazole pharmacore linked to various substituent groups. The 2-aminoimidazole pharmacore is predicted to bind an electronegative pocket separating the receiver and DNA-binding domains of a response regulator, while the substituent group maintains contacts with both domains. Precise tuning of the substituent group can provide for drastically increased specificity to a response regulator. In this work, a variety of expression and purification approaches were implemented to isolate both E. coli CsgD and S.Typhimurium CsgD. Following purification, these proteins were screened utilizing a thermal shift assay to investigate their propensity for ligand binding by the 2-aminoimidazole compounds. The N-terminal domain of E. coli CsgD, as well as the N-terminal domain and full-length constructs of S. Typhimurium CsgD suggest ligand binding in samples treated with AGL-869. While there are no known cures for either Alzheimer's or Parkinson's disease, efforts to develop effective diagnostic methods have identified a target group. This group is the group of stable oligomeric intermediates adopted by endogenous amyloids. These oligomeric intermediates are thought to be capable of exerting cytotoxic effects via formation of a pore-like complex with aberrant function. As a result of their propensity for aggregation, a typical approach utilized for the isolation of soluble, monomeric amyloids is the application of high concentrations of denaturants like guanidinium hydrochloride. While this is a standard approach, its application to an intrinsically disordered protein known to interact with chaperone complexes may prohibit the purified isolate from inhabiting its native range of conformations. This could potentially limit investigations of stable oligomeric species thought to be responsible for cytotoxic effects. In order to combat this, we co-expressed the DnaK-DnaJ-GrpE in order to efficiently solubilize and isolate recombinant E. coli CsgA under native conditions. Natively-purified CsgA was shown to exhibit secondary structural characteristics that diverge from established literature. Characterization of natively-purified CsgA and initial comparisons to CsgA purified using high concentrations of denaturant are also included.

GRADUATE STUDENT & POSTDOCTORAL SCHOLAR AWARDS

Podium Presentations Awards

Biomedical Sciences
Hoda Jabbour
Mentor: Mark Mannie
"A Novel Platform for Antiviral Therapy that Synergistically Combines the Antiviral Activities of a Viral Host Receptor and an Immune Modulator"

Human Health
Ankur Padhye
Mentor: John Willson
"Impact of Exertion and Load Carriage on Metatarsal Bone Stress in Physically Active Females"

Interdisciplinary Innovation and Humanities
Noah Green
Mentor: Kristina Simeonsson
"Removing Barriers to School Health Assessments with Optimally Timed Clinic Events Leveraging Partnerships Across the Healthcare System in Pitt County"

Community Engagement and Education
Elizabeth Pierce
Mentor: Travis Lewis
"Boosting Skills & Confidence: The Power of Peer Tutoring in High School Math"

Engineering, Technology, and Computer Sciences
Berwin Singh Swami Vetha
Mentor: Rukiyah Van Dross
"Optimization and Evaluation of Pluronic F127 Micelles for Cancer Drug Delivery Applications"

Fine Arts, Visual Arts, and Design
Narges Sedaghat
Mentor: Cat Normoyle
"The Role of Iranian Immigrants in Enriching America's Cultural Tapestry"

Natural Sciences
Mason Ross
Mentor: Zi-Wei Lin
"Numerical Evaluation of the Shear Viscosity of the Quark Gluon Plasma"

Social Sciences
Tanner Ruffin
Mentor: Mark C. Bowler
"I've Lost My Appetite for Work"

Poster Presentations Awards

Biomedical Sciences
Kylar Wiggins
Mentor: Tonya N. Zeczycki
"The Role of Amyloid Beta Peptides in the Innate Immune System: Antimicrobial Properties and Contributions to Alzheimer's Disease Onset"

Education
Jennifer Lee
Mentor: Kristen Gregory
"Teacher-Mentors Impacting Today's Middle School Students with Organization Strategies"

Engineering, Technology, and Computer Science
Anita Bhandari
Mentor: David Hart
"Evaluating Object Detection Algorithms for Crowded Sperm Microscopy Videos"

Human Health
Osahon Jeffery Asowata
Mentor: Jessica Cooke Bailey
"Sex and Race\Ethnic Differences in the Effect of Comorbidity on Glaucoma among Older Adults in the United States: Findings from the Health and Retirement Study"

Interdisciplinary Innovation
Katherine Foster
Mentor: Adriana Heimann Rios
"Elucidating Biofilms in Cueva Ventana and Their Impact on the Preservation of Culturally Significant Rupestrian Rock Art - A Collaborative Community-Geoscience Approach"

Social Sciences
Margaret Milteer
Mentor: Charles R. Ewen
"Shorty Your Silence Was Golden:" What Grave Markers Can Tell Us Beyond the Epitaph"

Natural Sciences
Emily Scott
Mentor: Fadi Issa
"Examining Astrocyte Development and Plasticity in Zebrafish (Danio rerio)"

UNDERGRADUATE STUDENT AWARDS

Podium Presentation Awards

Biomedical Sciences
Lawson Cross
Mentor: Dr. Karen Mruk
"Effect of Housing Conditions on Larval Zebrafish Spinal Cord Regeneration Post Spinal Cord Injury (SCI)"

Human Health
Emma Stewart
Mentor: Dr. Jamie Perry
"Consistency in Clinical Reporting of Nasopharyngoscopy Findings: A Multisite Study"

Humanities
Trenton Hightower
Mentor: Dr. George Bailey
"Does AI Truly Create Art? Exploring Questions of Intention and Perception"

Natural Sciences
Emma Lou Pakulniewicz
Mentor: Dr. Beth Thompson
"Characterization of Background-Dependent Effects of zfl1;zfl2 Double Mutants in Maize Development"

Visual Art & Design
Olivia Winter
Mentor: Dr. Catherine Walker-Bailey
"The Hands of Life"

Poster Awards

Biomedical Sciences
Lauren Garcia
Mentor: Dr. Lok Pokhrel
"Evaluating Treatment Efficacy of a Novel Nano-Antibiotic Against Drug-Resistant Pseudomonas Aeruginosa Planktonic and Biofilm Forms in a COPD Model"

Business
Kelly Adams
Mentor: Dr. Christine Kowalczyk
"Perceptions of AI-Generated Content: How College Students Feel about AI-created Content in the Field of Marketing"

Community Engagement
Rashanda Cooper
Mentor: Dr. Alice Richman
"Closing the Gaps and Increasing Community Involvement in Child and Maternal Health: Results of the 2024 North Carolina Title V Needs Assessment"

Education
Hannah Shook
Co-Presenters: Jordan Cline, Caleigh Jones
Mentor: Dr. Dierdre Larsen
"Impact of a Student-Led Clinical Practicum on Dysphagia Knowledge and Competency in Graduate Speech Pathology Clinicians"

Engineering
Chris Kalapurackal
Mentor: Dr. Morteza Nazari-Heris
"Using Second-Life Electric Vehicle (EV) Batteries as Energy Storage Economic, Environmental, and Social Impacts"

Human Health
Kendall Pixley
Mentor: Dr. Jessica Cooke Bailey
"Bridging Rural Inequities in Diabetes and Glaucoma Education and Screening in North Carolina (BRIDGES-NC)"

Natural Sciences
Caroline Pate
Mentor: Dr. Erin Field
"Identifying the Minimum Number of Bacterial Cells Needed for Metagenomic Sequencing: Guidelines for Fluorescence Activated Cell Sorting"

Nursing
Hannah Huffman
Mentor: Dr. Mitzi Pestaner
"Exploring the Influence of Self-Awareness of Emotions Among BSN Students"

Social Sciences
Elayna Arthur
Co-Presenter: Karigan Zaferatos
Mentor: Dr. Mi Hwa Lee
"College Students' Perceptions of Older Adults"

Technology & Computer Sciences
Majoie Ngandi
Mentor: Dr. Stephen Moysey
"Enhancing Air Quality Visualization for Pitt County: Developing an Interactive Data Platform"

CAPTURE 180 RESEARCH CHALLENGE

Overall Winner

Dhwani Hada
Mentor: Michael Baker

People's Choice Award

Lulea Adams
Mentor: Fidisoa Rasambainarivo

Weston Nelson
Mentor: Nic Herndon

WATER RESOURCES CENTER

Stakeholder's Choice Community Award Winner

Courtney Clarke
NSF CoPe Hyde County Community Liaison
"Hallowed Ground Hydrology: Understanding Fluctuation in Places of Permanence"

Stakeholder's Choice Student Award Winner

Precious Esong Sone
NSF NRT Trainee | MBA
"Reducing Diabetes Distress by using the Diabetes Distress Screening-17 (DDS-17) among adults"

CAPTURING THE ART OF SCIENCE

ECU LaserTAG

FIRST PLACE

Tie
Emma Pakulniewicz
Alexandria Warren

SECOND PLACE

Yongtao Thomas Hu

THIRD PLACE

Patrick Garrett