

# **RISE COHORT 14**

## **2019—2020**

### **Profiles**





## FELLOW PROFILE

2019- 2020

COHORT 14



### Tyra Critchley

**Year:** Senior

**Major:** Molecular Biology

**Mentor:** Dr. Rachel Bleich

#### **Current Research Activities:**

Studying the interactions of different E. Coli strains with E. Faecalis, in differing in vitro microbiomes to further understand infections and irritations occurring within the microbiome of the human gastrointestinal system.

#### **Additional Research Experiences:**

BIO 4990 last spring, studying the effects of Alzheimer's on the brain in the Bahr Lab.

#### **Honors, Award, Publications:**

Maynor Honors College

#### **Career Aspirations and Goals:**

I want to earn a PhD in Biomedical Engineering, with interests in prenatally preventing genetic diseases through genetic engineering; as well as tissue engineering and creation of DNA-specific solid organs.

**Conferences Attended:** ABRCMS

**Clubs and Organizations:** RISE

#### **Previous Research**

I spent this past summer doing DNA Metabarcoding of pollen spores collected from honey bee traps to find the specific pollen source they prefer. I have created a project to catalog all pollen species found in pollen traps of the hives at the UNCP Apiary, using genetic sequencing that will be continued by research students next summer.



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### **Cari Spivey**

**Year:** Junior

**Major:** Biology

**Mentor:** Erika Young

#### **Current Research Activities:**

I am going to do a species composition of odonate species and compare the populations in different ponds with different landscapes.

#### **Honors, Award, Publications:**

Silver Scholar 2018 and Bronze academic achievement award 2019

#### **Career Aspirations:**

After graduating from UNCP, I plan to go to graduate school to pursue a degree in biology where I can work in the field. After graduate school I hope to get a job working in a research lab.

#### **Conferences Attended:**

ABRCMS 2019

#### **Clubs and Organizations:**

Tri-Beta, treasurer and Psi Chi



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### **Johnathon Oxendine**

**Year:** Sophomore

**Major:** Environmental science

**Mentor:** Conner Sandefur

**Current Research Activities:**

Studying the biodiversity of the Lumber River

**Career Aspirations and Goals:**

To leave an influence that betters the planet.

**Conferences Attended:**

AISES

**Clubs and Organizations:**

Tri-Beta and Psi Chi



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### Joshua H. Cade

**Year:** Senior

**Major:** Biology/ Pre-Med

**Mentor:** Dr. Racheal Bleich

#### **Current Research Activities:**

The resident microbes in the human intestine are implicated in both IBD and I-CRC, and Escherichia coli (*E. coli*) are found in greater proportion in IBD and I-CRC patients. The overall goal of my research is to assess the colonization and phenotypes of *E. coli* strains isolated from Crohn's disease and healthy patients along the gastrointestinal (GI) tract. Traditional methods for determining bacterial identity, such as 16S sequencing, are unable to distinguish sub-strains of *E. coli* that are functionally distinct. To overcome this limitation, we use a novel barcoding technology on a collection of clinical *E. coli* strains isolated from IBD and healthy patients. This approach allows us to quantify genetically similar microbes in a complex community."

**Additional Research Experiences:** The Effect of Increasing Carbohydrate Concentrations on Expressed Intracellular and Extracellular Proteins by the *Photobacterium luminescens* Bacterium and the Relative Bioluminescent Output. Understanding the role of a Focal Adhesion Kinase inhibitor on Plasma Membrane expansion in developing Neurons. Genotype-Phenotype Correlations in Parkinson's disease: Retrospective Analysis of the NIH-PD Cohort

#### **Honors, Award, Publications:**

"Honors list Spring '17, Chancellors list Fall 2016, 2017, 2018 and fall/spring 2019, Honorable Mention for "Exceptional Summer Student" at NIH SIP "

#### **Career Aspirations and Goals:**

I am currently majoring in Biology with a pre-med emphasis in order to apply to medical school in the coming months. I have interests in attaining an MD/PhD degree or general MD degree to hopefully study/concentrate a focus on neuroscience and its direct connections to the world of medicine. I have a lot of interest in becoming a surgeon, more specifically, a neurosurgeon depending on which route I take after going through rounds in medical school.

#### **Conferences Attended:**

NC ASM, ABRCMS, SNCURCS, RISE End of Summer Symposium, PURC

#### **Clubs and Organizations:**

Student Honors Council (senior rep), NC HCAP (previous junior rep), Chemistry Honor Society RISE Fellow Chancellors Ambassador

**Previous Research** Previous mentors: Dr. Leonard Holmes and Danny Upadhyay (UNCP), Dr. Anthony Mangan (previously at UNC), Dr. Derek Narendra (NIH NINDS)"



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### Melanie Handley

**Year:** Senior

**Major:** Biology (Botany concentration); Sustainable Ag.  
Minor

**Mentor:** Dr. Pereira & Dr. White

#### **Current Research Activities:**

Currently working on a research proposal for "The effects of entomopathogenic fungi as endophytes in crop plants." Fungi that are already used as biocontrol of insect pests on crop plants have been shown in previous research to outcompete bad fungi that are pathogens of plants. I want to use similar methods to find out if this is true in economically & possibly culturally important plants of this community.

#### **Additional Research Experiences:**

With Dr. Sandefur as my mentor, I researched the genome of *Morella Cerifera* (wax myrtle). I researched the currently known medicinal and antimicrobial properties of the plant and compared these results to the purported uses of wax myrtle in Native American medicine. The purpose was to possibly connect the genetic variation and distribution of wax myrtle to the movements of Native Americans on the Trail of Tears.

#### **Honors, Award, Publications:**

Chancellor's List, Honors College

#### **Career Aspirations and Goals:**

I aim to become a plant pathologist that promotes sustainable agriculture practices including sustainable integrated pest management and prevention measures. I want to work closely with farmers to ensure the longevity of their land and their livelihoods. Farmers are few and far between and they work hard to meet our demands for food and carve a living out for themselves.

#### **Conferences Attended:**

AISES, NCAS, ABRCMS

#### **Clubs and Organizations:**

Greener Coalition, Honors College

#### **Previous Research:**

The summer of 2019 I had the opportunity to be a part of the BeeMORE REEU program at NC State University. BeeMORE stands for Bees and Microbes in Organized Research Experiences. I worked closely with a graduate student in an entomology lab researching the connections between flower morphology and the transmission of the bumble bee parasite "*Crithidia bombi*."



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### Aalayza Blackshear

**Year:** Junior

**Major:** Biology with a concentration of Zoology

**Mentor:** Dr. Amber Rock

#### **Current Research Activities:**

I am currently working on a project studying the effects of human activity on the Lumbee River. Pollution caused by urban runoff can decrease water quality in nearby rivers, which can negatively impact aquatic organisms such as benthic macroinvertebrates. Specifically, my research focuses on the effects of an urban area (Lumberton, NC) on benthic macroinvertebrate abundance and diversity in the Lumbee River.

#### **Honors, Awards, Publications:**

BRONZE Academic Achievement Award from New Student Programs, 2019

#### **Career Aspirations and Goals**

I plan to attend graduate school to study Wildlife Biology, Ecology and/or Conservation. In this time of anthropogenic environmental change, conserving biodiversity is important for maintaining natural ecosystem function. For my career, I am interested in studying wildlife populations to determine how humans are impacting them. My overall career goal is to develop solutions to help decrease human impacts on our natural ecosystems, with a focus on aquatic ecosystems.

#### **Conferences:**

I presented a poster at the RISE End of Summer Symposium in August 2019. I am also very excited to be attending ABRCMS in November.

#### **Clubs and Organizations:**

Vice President of the Biology Club



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### Erica Baynard

**Year:** Junior

**Major:** Biology

**Mentor:** Dr. Santisteban

**Current Research Activities:** In my research with Dr. Santisteban, we are currently trying to find the correct PCR that we can combine with the SWR1 gene that will not kill off the rest of the NAT cassette after removing SWR1 from the strand.

**Career Aspirations and Goals:**

I would love to be involved in research that benefits the health of other people. My career goal is to become a Genetic Counselor, and I am interested in cancer research.

**Conferences Attended:**

ABRCMS, PURC, NCAS

**Clubs and Organizations:**

Biology Club  
Zeta Phi Beta

**Previous Research:**

In Summer 2019, I spent 8 weeks researching with radiation resistant cells and their relationship with lipid raft formation using reactive oxygen species.





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### Zachery Bayles

**Year:** Junior

**Major:** Middle Grades Science Education/General Biology

**Mentor:** Dr. John Roe

#### **Current Research Activities:**

I am currently researching apparent survivorship of eastern box turtles at Weymouth Woods and Lumber River State Parks. I also assist Dr. Roe with data collection at the two field sites in support of a longitudinal study of the turtles.

#### **Honors, Award, Publications:**

UNCP Chancellor's List Fall 2018- Present

#### **Career Aspirations and Goals:**

After completing my undergraduate degree, I plan on pursuing a graduate degree in ecology or environmental biology. During my time spent researching box turtles, I discovered how much I enjoy getting out in the field to study the complex interactions between living organisms at every level and their environment. After obtaining a graduate degree, I hope to enter a career that not only affords me the opportunity to conduct field research, but also to teach or interface with the public and share my excitement for science.

#### **Conferences Attended:**

RISE Summer Symposium 2019, ABRCMS 2019,

#### **Clubs and Organizations:**

Kappa Delta Pi Honor Society- Vice President



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## Nysja Campbell-Small

**Year:** Junior

**Major:** General Chemistry

**Mentor:** Dr. Rachel Smith

### **Current Research Activities:**

Still looking for a professor to do research with.

### **Career Aspirations and Goals:**

I hope to get into a graduate school doing some sort of research related to pharmaceuticals. A goal of mine is to work for a company that does medical research for pharmaceuticals.

### **Conferences Attended:**

ABRCMS



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### Jessica Dean

**Year:** Senior

**Major:** Molecular Biology

**Mentor:** Dr. Maria Santisteban

#### **Current Research Activities:**

I am currently doing research in yeast genetics with Dr. Maria Santisteban, studying histone modifications and nucleosome remodeling complexes active in transcription initiation and elongation. Our investigation is focused on two *Saccharomyces cerevisiae* double mutants to test the hypothesis that HTZ1 and the chromatin remodeling complex, SWR1-C, operate in the same pathway, or if there are any unknown applications for SWR1-C.

#### **Additional Research Experiences:**

Previously, I have conducted research with Dr. Conner Sandefur in assessing the biodiversity of the Lumber River. Over the summer, I had the opportunity to explore my passion for cancer research at Wake Forest School of Medicine in the Kerr Lab, where I studied prostate cancer metastasis and CD117/C-KIT activation and migration.

#### **Honors, Award, Publications:**

Richmond Community College, Associate in Science, Summa Cum Laude  
Tau Sigma National Honor Society  
Chancellor's List Fall 2018, Spring 2019

#### **Career Aspirations and Goals:**

As a survivor of childhood leukemia, I am very passionate about pediatric oncology and cancer research. My goal is to earn a PhD in immunology and spend my life researching immunotherapies for cancer and autoimmune diseases.

#### **Conferences Attended:**

UNCP End of Summer Research Symposium 2018 & 2019, NCAS 2019, PURC 2019, and Wake Forest Summer Research Symposium 2019. I plan to attend: ABRCMS 2019, NCAS 2020, PURC 2020

**Clubs and Organizations:** Biology Club and RISE

#### **Previous Research:** Summer 2018:

UNCP, Dr. Conner Sandefur, RISE Summer Research Program  
Investigation of the Biodiversity in the Lumber River

Summer 2019:

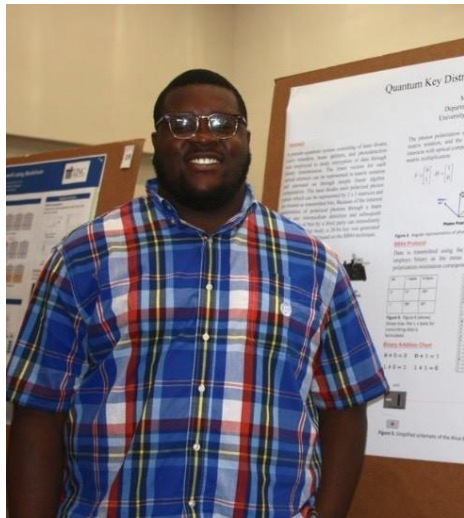
Wake Forest School of Medicine, Dr. Bethany Kerr, Program to Promote Diversity in Cancer Research  
Biomarker CD117: An Indicator for Prostate Cancer Recurrence and Metastasis.



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### Shamon Mercier

**Year:** Sophomore

**Major:** Biology (Biomedical Emphasis) Minor in Medical Sociology

**Mentor:** Dr. Kelly and Dr. Vallabha

#### **Current Research Activities:**

I am taking fire ants from a Carolina Bay and sequencing their DNA to answer a variety of questions about fire ants and their way of life.

#### **Additional Research Experiences:**

During summer 1 of 2019 at The University of North Carolina at Pembroke, I worked in Dr. Quinton Rice lab. In his lab I focused on Quantum Cryptography and how it can be used to secure data transmissions.

#### **Career Aspirations and Goals:**

After undergraduate I hope to go into a Md/PhD program to become a doctor in orthopedic surgery with a PhD in Biomedical Engineering.

#### **Conferences Attended:**

RISE Symposium, PURC

#### **Clubs and Organizations:**

Tri Beta, HCAP, Biology Club, RISE Program, NAACP

#### **Previous Research**

In high school (2017), I worked at Duke University in the Pratt School of Engineering. I was in Dr. Franklins lab and my main research focuses was to produce a working transistor using the chemical compounds  $\text{SnSe}_2$ ,  $\text{MoS}_2$ ,  $\text{WSe}_2$ .



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### **Tyler Cox**

**Year:** Senior

**Major:** Biology/ Psychology

**Mentor:** Crystal Walline

#### **Current Research Activities:**

We work to isolate RNA from human saliva. We are working to improve yield and lower contamination. We want to sequence our samples, and then analyze for biomarkers for autoimmune diseases.

#### **Additional Research Experiences:**

Before joining RISE, I did research with Dr. Sandefur on plant genetic differences of *Phoradendron leucarpum* from the south east to the south west. I also worked at RCC on a biodiesel project.

#### **Honors, Award, Publications:**

Pembroke Gold Scholar, Honors list, Honors College (RCC)

#### **Career Aspirations and Goals:**

I would like to teach at a higher level institute. I would really like to be at a teaching university. I would also like to do undergrad research.

**Conferences Attended:** EOS Research Symposium, PURC, ABRCMS, NCHA

**Clubs and Organizations:** Tri-Beta, Psi Chi, Biology Club, Psychology Club

#### **Previous Research:**

In 2018 I worked with Dr. Sandefur on determining differences of *Phoradendron leucarpum* (American Mistletoe) from the south east to the south west.



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### Nicholas Willard

**Year:** Senior

**Major:** Chemistry

**Mentor:** Dr. Flowers

#### **Current Research Activities:**

Neuromuscular transmitter software development meant to stimulate different scenarios of diseases

#### **Career Aspirations and Goals:**

Working with Hazardous Material i.e. venoms, toxins, poisons, chemical engineering, thermochemistry

#### **Conferences Attended:**

ABRCMS California

#### **Previous Research**

Neuromuscular transmitter software development meant to stimulate different scenarios of diseases (Dr. Poage, UNCP Summer 2019)



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### Caitlyn Young

**Year:** Senior

**Major:** Biology

**Mentor:** Dr. Karen Farizatto

#### **Current Research Activities:**

Currently, I am working on uncovering astrocytic responses in association with neuronal pathology after organophosphate exposure.

#### **Honors, Award, Publications:**

Chancellor's List Spring 2017 and Honor's List Fall 2018-Present

#### **Career Aspirations and Goals:**

I plan to receive my Master's in Clinical Research and Product Development at UNCW. Following, I would love to work in industry with PPD.

**Conferences Attended:** ABRCMS

**Clubs and Organizations:** Alpha Pi Omega and NASO



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### Jazlyn Pointer

**Year:** Senior

**Major:** Biology with a zoology concentration

**Mentor:** Dr. Young

#### **Current Research Activities:**

Currently I am conducting an inventory of Lepidoptera and other night flying insects. A primary interest in my current research is if certain insects are attracted to specific types of light.

#### **Additional Research Experiences:**

During the summer of 2018, I used aquatic macro-invertebrates as bio-indicators of pollution and overall health in the Eno and Lumber River. During the school year of 2018-2019 I used aquatic macro-invertebrates to see the biotic difference in man-made ponds and vernal pools.

#### **Career Aspirations and Goals:**

I plan to get my masters and eventually a PHD in wildlife/environmental biology. I aspire to become a zoological research scientist that observes and documents all manner of behavioral, evolutionary, and environmental aspects not yet known about the zoological world.

#### **Conferences Attended:**

- UNCP RISE End of Summer Research Symposium (2018)
- Annual Biomedical Research Conference of Minority Students (ABRCMS 2018)
- Southeast Association of Biologists (ASB 2019)
- North Carolina Academy of Science (NCAS 2019)
- Pembroke Undergraduate Research

#### **Clubs and Organizations:**

Biology Club, Greener Coalition, TriBeta

#### **Previous Research**

During the summer of 2019 I worked with Dr. Michelle Trautwein in the School of Systematics Institute program at the California Academy of Sciences in San Francisco, California. I used molecular techniques to discover the evolutionary relationships between flies in the genus *Exoprosopa*. I also used morphological techniques to describe a species, *Exoprosopa Duncanii*.