

RISE COHORT 13

2018—2019

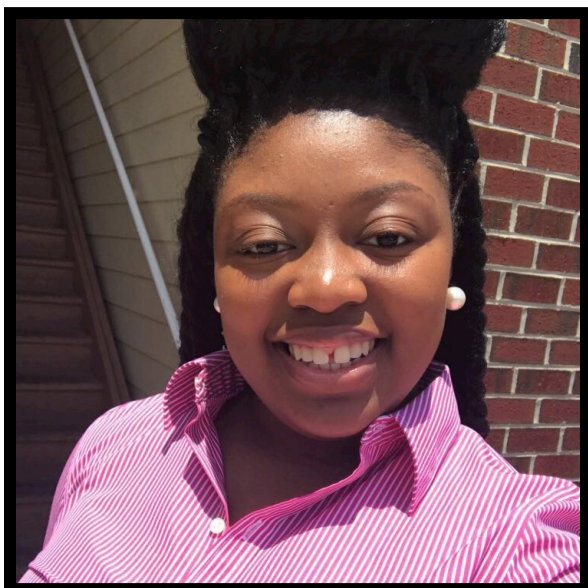
Profiles



FELLOW PROFILE

2018—2019

COHORT 13



Britney Alcira

Year: Senior

Major: Biology with Mathematics minor

Mentor: Dr. Ben Bahr

Current Research Activities:

Currently, I am working on preliminary steps of using bioinformatics to reveal genes expressions of a rat's hippocampus after exposure to N-methyl-D-aspartate (NMDA), causing a mini stroke. The purpose of causing this excitotoxic stimulation is to resemble to effects of the Soman nerve agent.

Previous Research Experience:

Department of Chemistry and Physics at Pembroke, Pembroke, NC Research Assistant, Dr. Paul Flowers August 2017 – May 2018 Designed and fabricated devices permitting Spectroelectrochemical measurements using microscale samples of less than a microliter. In addition, performed chemical analysis of Potassium Ferricyanide and Methylene blue using electrochemistry and Raman Spectroelectrochemistry techniques.

Honors, Awards, Publications:

Oral Presentation Britney G. Alcira, Abigail Casey, Caroline Campbell, Mathew Hren , Gregory Triplett, The Study of Phosphorylatable Amino Acid Structural Fingerprints, at VCU Summer Undergraduate Research Program in Mechanobiology of Disease and Nanomedicine Symposium, July 2018 Poster Presentations Britney G. Alcira, Abigail Casey, Caroline Campbell, Mathew Hren , Gregory Triplett, The Study of Phosphorylatable Amino Acid Structural Fingerprints, UNCP RISE End of Summer Research Symposium, August 2018; Biomedical Engineering Society, Annual Meeting (BMES), October 2018 Britney G. Alcira, Dr. Paul Flowers, Microscale Chemical Assays using Raman Spectroelectrochemistry, at PURC Symposium, April 2018

Career Aspirations and Goals:

“Don't let anyone look down on you because you are young, but set an example for the believers in speech, in conduct, in love, in faith and in purity” - 1 Timothy 4:12. This verse inspires me to not let my physical appearance, statistics, and rejections stop me from reaching my goal. My goal in life is to become the most successful black women in biomedical engineering and a valuable mentor for minorities. As a career goal, I want to become a director of a cancer research lab to engineer a technological instrument that would further cancer research and improve the quality of life for people internationally. In order to reach this goal, I am going to pursue a PhD in Biomedical Engineering.



FELLOW PROFILE

2018—2019

COHORT 13



Erica Baynard

Year: Sophomore

Major: Biology

Mentor: Dr. Maria 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 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.

Conference Attendance:

ABRCMS 2018



FELLOW PROFILE

2018—2019

COHORT 13



Josh Cade

Year: Junior

Major: Biology/Pre-Med

Mentor: Dr. Leonard Holmes

Current Research Activities:

I am currently working on a project that aims to isolate and identify some of the toxic proteins involved in the infection of insects by the pathogenic bacteria *Photorhabdus luminescens*.

Previous Research Experience:

Last semester I conducted an experiment in which I observed the effects of increasing carbohydrate concentrations on the bacterial density and bioluminescent output of the pathogenic bacteria, *Photorhabdus luminescens*.

Career Aspirations and Goals:

Currently, I have goals of attending an MD/PhD program. Through that route, I would attend the first 2 years of medical school and go on to get my PhD following that. I have hopes of incorporating that into some sort of surgical application, or an overall clinical healthcare career in the field of neuroscience/neurobiology.

Conference Attendance:

ABRCMS, SNCURCS, American Society of Microbiology (ASM), PURC

Clubs and Organizations:

Health Careers Access Program (Junior Representative)

Student Honors Council (Junior Representative)

RISE Fellow

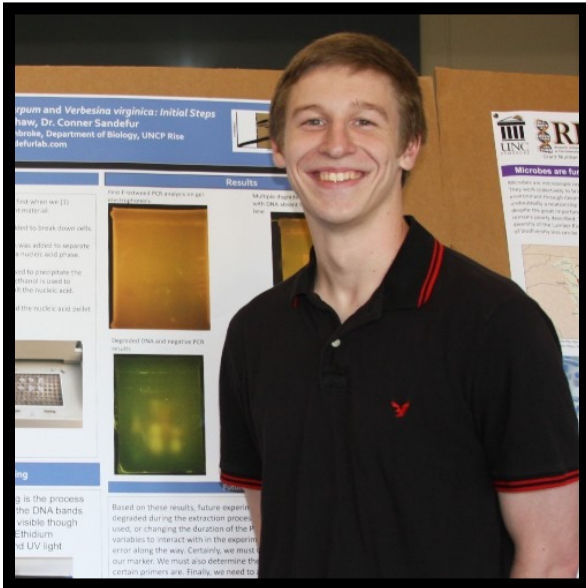
Lambda Sigma Honors Society (sophomore year)



FELLOW PROFILE

2018—2019

COHORT 13



Colton Crenshaw

Year: Senior

Major: Biology (Botany Concentration)

Mentor: Dr. Joseph White

Current Research Activities:

I am currently researching the essential oil production of medicinal plants through photo-period, and will test the stimulated oils on gut microbes and their anti-microbial properties.

Previous Research Experience:

Summer 2018 UNCP with Dr. Sandefur under RISE. Worked on the genetic diversity of "Verbesina virginica"

Career Aspirations and Goals:

Earn a PhD in Biochemistry or Plant Physiology

Conference Attendance:

ABRCMS 2018

Clubs and Organizations:

Biology Club



FELLOW PROFILE

2018—2019

COHORT 13



Jessica Dean

Year: Junior

Major: Biology (Molecular Concentration)

Mentor: Dr. Conner Sandefur

Current Research Activities:

I am currently working in the Sandefur Lab where we are investigating the microbial biodiversity of the Lumber River by means of traditional culturing techniques, DNA extraction/sequencing and PCR.

Previous Research Experience:

I began my research on the investigation of the microbial biodiversity in the Lumber River with Dr. Sandefur in the summer of 2018 through the RISE Summer Research Program.

Career Aspirations and Goals:

My career aspirations are to earn a PhD in cancer biology/genetics and make contributions to cancer research. I am passionate about pediatric oncology and I dream of one day starting a non profit that provides help, understanding and group support to families affected by childhood cancer and other life-threatening illnesses.

Honors, Awards, Publications:

Richmond Community College, Associate in Science, Summa Cum Laude

Conference Attendance:

RISE Summer Symposium 2018, ABRCMS 2018

Clubs and Organizations:

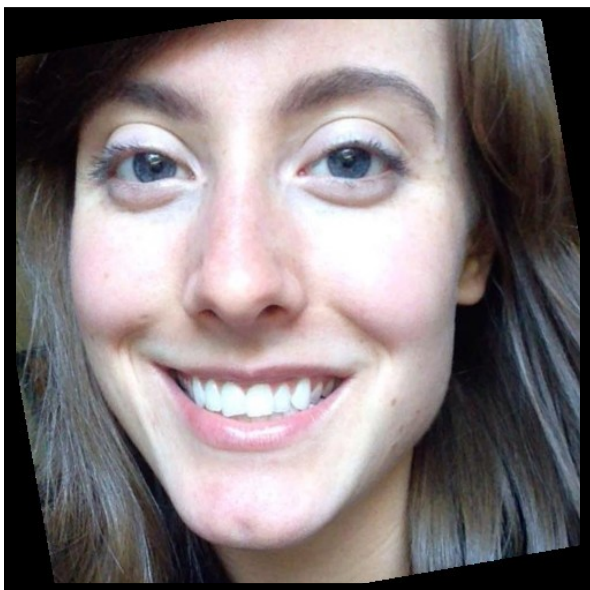
Biology Club



FELLOW PROFILE

2018—2019

COHORT 13



Melanie Handley

Year: Junior

Major: Biology (Botany Concentration)

Mentor: Dr. Conner Sandefur

Current Research Activities:

We are investigating the genome of *Morella Cerifera* (Southern Wax Myrtle). Eventually we will amplify the microsatellites (found in variants of the same species of wax myrtle) found and see if there is a close correlation with the medicinal chemical/biological properties of wax myrtle.

Career Aspirations and Goals:

I aspire to be a plant pathologist and earn a doctorate in said field. I hope to do so at NC State, as they have great agriculture programs and strong connections with local farmers. I want to use my profession as an outlet for community service for the farmers and farm-workers that keep food on our tables and in our bellies. I want to be able to diagnose and recommend action to be taken for farmers so that they do not lose their yield and their livelihood. I want to have a balance of lab work and field work because I don't like being cooped up inside all day. This being said, I will just have to make sure that my lab time is spent on relevant research to plant pathology and reducing the odds that a farmer ever reaches the Economic Injury level of their crop.

Honors, Awards, Publications:

Chancellor's List since 2016. Honors College

Conference Attendance:

AISES National Conference

Clubs and Organizations:

Greener Coalition, Honors College



FELLOW PROFILE

2018—2019

COHORT 13



Jasmine Kelly

Year: Junior

Major: Environmental Science

Mentor: Dr. John Roe

Current Research Activities:

I am working with Dr. Roe on the Eastern Box turtle. We are grinding and drying various foods that box turtles have been observed eating at local state parks. From these grindings we are examining the isotopes.

Career Aspirations and Goals:

I would love to work in the field conducting research as a conservation biologist. It would be an amazing goal for me to get people to understand the importance and value of all life.

Honors, Awards, Publications:

Honors List Spring 2017

Conference Attendance:

ABRCMS 2018, Southeast Association of Biologists 2019

Clubs and Organizations:

The Greener Coalition

FELLOW PROFILE

2018—2019

COHORT 13



Cheyenne Lee

Year: Senior

Major: Biotechnology

Mentor: Dr. Conner Sandefur

Current Research Activities:

Using the Kirby-Bauer Disk Diffusion assay, I am testing the antibiotic properties of the plant *Hypericum hypericoides* (St. John the Worker/St. Andrew's Cross) against bacteria that live on the body. More specifically, we hope to utilize this plant in the treatment of Type II Diabetes by potentially balancing the imbalanced gut microbiome of affected individuals.

Previous Research Experience:

HHMI-EXROP and Biomed SURF student Yale University Summer 2017: I worked in Dr. Christine Jacobs-Wagner's lab with graduate student William T. Gray on the localization of ribosomes in *E. coli* during their transition from log to stationary phases of growth. I used a fancy fluorescent microscope to observe Green Fluorescent Protein (GFP) tagged ribosomes and how they moved as the cells matured through their lives. BIT-SURE Program NC State Summer 2018: I worked in Dr. Benjamin Reading's lab with Dr. Scott Salger and Malik Lindsay on analyzing the skin microbiome of the anadromous striped bass using Next-Generation Sequencing. Malik was my also undergraduate lab partner for the whole summer, and together we used QIIME 2, ran many gels, and performed tons of Polymerase Chain Reactions (PCRs) to quantify what lived on the skin of these fish as

Career Aspirations and Goals:

To teach people science that have forgotten it or never had an adequate education in it to begin with. I want to specialize in public outreach either at a university or as a part of industry. I want to obtain my Ph.D and do microbial research.

Conference Attendance:

Annual Biomedical Conference for Minority Students (ABRCMS)

Fall 2016, 2017, 2018 North Carolina Academy of Sciences (NCAS)

Spring 2017, 2018 SNCURCS (State of North Carolina Undergraduate Research and Creativity Symposium)

Fall 2017 Pembroke Undergraduate Research and Creativity Symposium (PURC)

Spring 2017, 2018

Honors, Awards, Publications:

Howard Hughes Medical Institute (HHMI) Exceptional Research Opportunities Program (EXROP) Awardee

Derieux Award 1st place Botany poster section at North Carolina Academy of Sciences (NCAS) conference

Chancellor's List UNCP Fall 2015 - Present

Clubs and Organizations:

NSF-COMPASS Scholar

Esther G. Maynor Honors College

UNCP Biology Club

FELLOW PROFILE

2018—2019

COHORT 13



Dakota Lee

Year: Senior

Major: Biology

Mentor: Dr. Conner Sandefur

Current Research Activities:

Development of a system of mathematical equations, that when implemented in Python, capture the behavior of ions and materials, such as glucose, diffusing across an intestinal lining.

Previous Research Experience:

Microbial research with Dr. Conner Sandefur involving experimental testing of the antimicrobial properties of native plants such as pokeberry. Physics and optics based research with Dr. Bill Brandon about various physics based concepts such as; Malus' Law, Verdet constants, and the photoelectric effect. Biomedical engineering research at the Georgia Institute of Technology with the Hang Lu lab under the mentorship of Nan Xu and the EBICS program. This research involved analysis of the neural structure of *C. elegans* worms using MATLAB image analysis techniques.

Career Aspirations and Goals:

I am pursuing a PhD currently and hope to perform more advanced research based in biomedical engineering. Much of my research has dealt with large data analysis and computational work of many different kinds, so I am looking forward to conducting similar research with a biological emphasis.

Conference Attendance:

ABRCMS, PURC, NCAS, SNUCRS, AISES

Honors, Awards, Publications:

Coauthored in the article: "HIGH PRECISION MEASUREMENTS LEND NO SUPPORTING EVIDENCE OF PREVIOUSLY REPORTED LARGE VERDET CONSTANTS FOR OLIVE OIL" published in the European Scientific Journal.

COMPASS Scholar Chancellor's List

Clubs and Organizations:

COMPASS, Maynor's Honors college, Biology Club

FELLOW PROFILE

2018—2019

COHORT 13



Cody Morazan

Year: Senior

Major: Computer Science

Mentor: Dr. Conner Sandefur

Current Research Activities:

- Created a Python program that searches, parses, and returns key information from a database for biological and biomedical research purposes.
- Developed and implemented an ordinary differential equation model of bacteria-mediated glucose regulation with the potential to predict therapeutic options for diabetes.

Career Aspirations and Goals:

Become director or manager in a team of R&D Software Developers/Data Scientists

Conference Attendance:

ABRCMS, AISES



FELLOW PROFILE

2018—2019

COHORT 13



Dontae Mosley

Year: Senior

Major: Biotechnology

Mentor: Dr. Conner Sandefur

Current Research Activities:

I am currently working on Pinpointing Bacteria behind the Waste Water Treatment Plant in Pembroke, North Carolina. This research focuses on identifying and characterizing bacteria behind the waste water treatment plant in Pembroke, North Carolina. Water samples are collected from the river behind the plant and tested for faecal coliforms. Preliminary data demonstrate the presence of *E. coli* suggesting possible contamination. Further testing to quantify the amount of *E. coli* and identify other gram negative bacteria is ongoing.

Previous Research Experience:

Digging for Novel Antibiotics in #BraveNation. This research focused on testing the antimicrobial properties of soil bacteria. Newly emerging antibiotic resistant bacteria - "Super bugs" - such as methicillin resistant *Staphylococcus aureus* are responsible for thousands of hospital-acquired infections. Therefore, it is imperative that we identify novel antibiotics to fight 'super bugs' and our soils are filled with uncharacterized bacteria, which may hold the key to emerging antibiotic resistant bacteria. For this research, two undergraduate research mentors and four BraveStart BIO 1000 students worked together to collect, isolate and test soil bacteria for growth inhibition properties against laboratory strains of *E. coli*, *S. aureus*, *P. aeruginosa*, and *K. pneumoniae*. Out of the microorganisms tested, six were able to inhibit the growth of *E. coli*. Four of the microorganisms were found in the Pembroke area and further testing of local soils could lead to more discoveries.

Career Aspirations and Goals:

My main goal is to graduate from UNCP with my biotechnology degree. After graduating, I want to attend graduate school and earn my PHD in biochemistry. My career aspirations is to work at a pharmaceutical company and research different medicines and diseases .

Conference Attendance:

Annual Biomedical Research Conference for Minority Students, Indianapolis IN

Clubs and Organizations:

Brother 2 Brother , Young Society

FELLOW PROFILE

2018—2019

COHORT 13



Jazlyn Pointer

Year: Junior

Major: Biology (Zoology Concentration)

Mentor: Dr. Erika Young

Current Research Activities:

Over the summer I started to research Macro-invertebrates as bio-indicators of pollution and overall health of the Eno and the Lumber river. The research I am doing currently is a continuation of the research I did over the summer.

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.

Conference Attendance:

ABRCMS 2018

Clubs and Organizations:

Biology Club—President

Greener Coalition—Member

FELLOW PROFILE

2018—2019

COHORT 13



Fredejah Royer

Year: Senior

Major: Biology

Mentor: Dr. Conner Sandefur

Current Research Activities:

I am currently studying the antimicrobial properties of *Sassafras Albidum*. Which is a plant traditionally used by Southeastern Native American communities to treat bacterial based infections. The leaves, roots, and bark of this plant was used to make a tea, which was then consumed by the individual to treat infection. Based on this traditional use, we wanted to investigate the antimicrobial properties of *Sassafras Albidum*, with an overall goal of addressing disrupted gut microbiota common to individuals with type 2 diabetes. The first step was composing aqueous extracts using the leaves of *Sassafras Albidum* and testing them against 13 aerobic and facultative anaerobic bacteria via agar diffusion. I have found the inhibitory actions take place when using a lower concentration of *Sassafras Albidum* between .06-.08 grams to 500 microliters of Distilled Deionized H₂O. Thus far, extracts were identified as having inhibitory action against *Micrococcus luteus*, *Neisseria sicca*, and *Pseudomonas aeruginosa*. While extracts did not inhibit the growth of; *Bacillus subtilis*, *Staphylococcus epidermidis*, *Escherichia coli*, *Klebsiella pneumonia*, *Enterococcus faecalis*, *Corynebacterium xerosis*, *Proteus vulgaris*, *Proteus mirabilis*, *Enterobacter aerogenes*, and *Staphylococcus aureus*. After further replications of this experiment are completed, one future direction is investigate the impact of aqueous extracts on the anaerobically growing bacteria commonly found in the gut as a potential therapeutic avenue. To address the disrupted gut microbiota observed in type 2 diabetes.

Previous Research Experience:

Summer 2018, Dr. Conner Sandefur, "A systemic review of traditional medicinal plants" : I conducted a Meta-Analysis/systemic review on traditional medicinal plants. There are numerous traditionally used medicinal plants native to the US. These plants have been used for many different treatments are far as illnesses and diseases. As research has evolved, scientists have conducted experiments testing the medical properties of some of these plants. A subset of researchers are trying to isolate the compound(s) in plants that give them antimicrobial properties. There are multiple ways to test the plants and isolate the compounds including gas chromatography, cell cultures, essential oil enhancements, and many other strategies. In this systematic review, I have thoroughly read through multiple research papers that tested medicinal plants.

Career Aspirations:

Once I have successfully completed a PhD program in microbiology I want to become a Medical Research scientist. In this career you conduct research that is meant to improve the overall health of the population. Medical research scientists conduct clinical trials for medication after they have conducted studies on human diseases. They prepare and analyze medical samples and data that are involved in the causes and treatment of toxicity, pathogens, or chronic diseases. I hope to obtain this career at the Center for Disease Control and Prevention headquarters in Atlanta Georgia.

Conference Attendance:

- Annual Biomedical Research Conference of Minority Students (ABRCMS 2017)
- North Carolina Academy of Science (NCAS 2018)
- Pembroke Undergraduate Research & Creativity Symposium (PURC 2018)
- UNCP RISE End of Summer Research Symposium (2018)
- Annual Biomedical Research Conference of Minority Students (ABRCMS 2018)
- North Carolina Academy of Science (NCAS 2019)
- Pembroke Undergraduate Research & Creativity Symposium (PURC 2019)

Clubs and Organizations:

Indianhead Yearbook Production

FELLOW PROFILE

2018—2019

COHORT 13



Kaitlan Smith

Year: Senior

Major: Biotechnology

Mentor: Dr. Ben Bahr

Current Research Activities:

I am currently working in the William C. Friday Alzheimer's laboratory under the direction of Dr. Ben Bahr. Dr. Bahr's research focuses on the compound PADK, a positive lysosomal modulator, and how it affects protein degradation and clearance in the Alzheimer's brain. My research is currently focused on analyzing the effects that PADK had on genetically modified female rats when they were put through a behavioral trail. These rats have a form of mild cognitive impairment (MCI) if my finding were to show a positive drug effect that would suggest that PADK could potentially aid in the protein degradation and clearance events in the early stages of Alzheimer's disease.

Previous Research Experience:

Along with working in Dr. Bahr's lab, I have also worked in Dr. Paul Flowers laboratory. During my time in Dr. Flowers laboratory, I was responsible for developing an acetaminophen assay using spectroelectrochemistry which can identify and quantify acetaminophen in aqueous buffer solutions and in human serum without the interference of commonly paired compounds such as caffeine and aspirin. Because of my input in the experimental design this assay now reaps the potential benefits of being faster and less expensive than other assays which are currently being used in a clinical setting. In the summer of 2018 I had the wonderful opportunity of working in Dr. Francesco DeMayo's Pregnancy and Female Reproduction laboratory. My project was a preliminary study that involved testing kinase inhibitors in endometrial cancer cell models to investigate the nuclear translocation of the Forkhead Box Protein O1, a transcription factor, that is crucial to successful embryo implantation.

Career Aspirations and Goals:

After receiving my undergraduate degree, I plan to pursue a graduate degree in a biotechnology or pharmacology related field. I have found through my research and personal experience, that I enjoy studying pathways in the body that are affected by disease, and finding potential therapeutics that will restore the pathway and alleviate associated symptoms. I believe that through science, you can improve and solve many of the problems that we as humans face daily. Post graduate school my career goals include being able to advance the bioscience industry through team based projects and to use biotechnology as a tool to promote human growth and development.

Honors, Awards, Publications:

Honors and Awards: NIGMS-RISE Fellow (2017-2019) Ruth Sampson Locklear Academic Excellence Award (April 2018) John Bowley Derieux Research Award (March 2018) GlaxoSmithKline Women in Science Scholar (2017-2018) UNCP Merit Scholarship Recipient (2015-2016) UNCP Athletic Scholarship Recipient (2015-2016) Publications: Romine H, Rentschler KM, Smith K, Edwards A, Colvin C, Farizatto KLG, Pait MC, Butler D, and Bahr BA (2017) Potential Alzheimer's disease therapeutics among weak cysteine protease inhibitors exhibit mechanistic differences regarding extent of cathepsin B up-regulation and ability to block calpain. Eur Sci J 13 (Oct. suppl.): 38-59.

Conferences:

American Indian Science and Engineering Society (October 2018) Annual Biomedical Research Conference for Minority Students (November 2018) North Carolina Academy of the Sciences (2019)

Clubs and Organizations:

UNCP Softball Team (2015-2016)



FELLOW PROFILE

2018—2019

COHORT 13



Victoria E. Spencer

Year: Senior

Major: Biology (Zoology Concentration)

Mentor: Dr. Erika L. Young

Current Research Activities:

I am conducting research on the red imported fire ant, looking at how it impacts its environment and whether or not fire ant mounds disrupt the naturally occurring microbes in the soil.

Previous Research Experience:

Over the summer and in the beginning of the semester, I worked on constructing and EPT and biotic index for the Lumber river. This sample method looks at the beneficial insect orders that are most abundant in healthy streams and serves as a model to assess other streams. Based on the EPT index, the Lumber river had a fairly poor score, with very little EPT orders present throughout my samples.

Career Aspirations and Goals:

I want to pursue graduate school and earn my masters and Ph.D in conservation biology. I am very fascinated with the biodiversity of this world and want to study endangered species and look at ways to help rebound their populations.

Honors, Awards, Publications:

RISE Fellow (May 2018 to present)

SECU- GrowingChange intern (May to August 2018)

Honors list (fall 2017- present)

Conference Attendance:

RISE End of Summer research Symposium (August 2018)

Annual Biomedical Research Conference for Minority students (November 2018)

Clubs and Organizations:

Greener Coalition- President



FELLOW PROFILE

2018—2019

COHORT 13



Marica S. Thomas

Year: Junior

Major: Environmental Science

Mentor: Dr. Kaitlin Campbell

Current Research Activities:

-Research on Apis Mellifera Honey bees -Record internal cluster temperature of honey bee colonies and external outside temperatures using iButtons -Monitor parasite loads such as nosema and Varroa Destructor mites Determining if external factors such as temperature affect parasite loads and if external temperature affects the internal cluster hive.

Previous Research Experience:

2018 Summer REU Research- I did work with my mentor Dr. Jessica McCarty at the Miami University under the theme of Ecology, Plants and Pollinators. My mentor and I worked together to create a "Bee Tourism Map" for the city of Oxford, Ohio. This project was intended to prompt more discussion for pollinator gardens to be implemented in addition to implementing a Bee Tour in the Oxford community. This was a unique project that incorporated environmental science, geography and public administration/local government.

Career Aspirations and Goals:

My career aspirations are to be Environmental Scientist, more specifically a hydrologist. I plan to obtain my masters degree in Hydrology and environmental policy, eventually implementing both my major (environmental science) and minor (public administration political science) into a career goal. My main and most yearning career aspiration is to be a state legislator to serve as a lawmaker for environmental policy.

Honors, Awards, Publications:

UNCP Honors List (2016 & 2017)
Bronze Scholar Award (2017 & 2018)

Conference Attendance:

2017 & 2018 UNCP Research Symposium
2018 Ornamental Workshop Conference on Disease and Insects

Clubs and Organizations:

Greener Coalition , ASO