

EDUCATION

Emory University , Atlanta, GA	Population Biology, Ecology, and Evolution PhD	Expected 2026
The University of Kansas , Lawrence, KS	Microbiology BS	May 2020

RESEARCH EXPERIENCE

Soil Ecology and Biogeochemistry, Emory University, Debjani Sihi Ph.D. July 2021 – Current

- **Rotational Project:** Amended soil pots with biochar to enhance CO₂ sinkage in indigenous plant species and maize, simulating different land usage. Air-tight chambers were flooded with ¹³CO₂ and plants photosynthesized until CO₂ levels returned to atmospheric levels. Undergraduates were led through soil processing and root collection. Samples are awaiting microbial and biochemical analyses. CO₂ consumption will be measured in roots by quantifying ¹³C presence.
- **Dissertation Project:** In this DOE funded project, characterization of microbial communities in Terrestrial Aquatic Interfaces (TAIs) through field work will be used to better inform carbon cycling and modelling of TAIs.

Microbial Mats in Puerto Rico, University of Kansas, Jennifer Roberts Ph.D. September 2018 – June 2020

- Investigating halophilic bacteria in Puerto Rico to better understand the role of microbes in the development of sediment (and vice versa) in modern stromatolites; also trying to understand conditions for life on Mars with this extreme environment.
- Led the mini mobile lab in Puerto Rico during field research so that I could quickly inoculate media. Collected samples in unique locations individually, and prepared methanogenic and iron and sulfur reducing media. Investigating ecology of *E. coli* by isolating from samples.

Investigating Macrolide Resistance in *Neisseria gonorrhoeae*, Harvard T.H. Chan School of Public Health

Yonatan Grad MD Ph.D. June 2019 – August 2019

- Learned to computationally analyze genomic metadata with a genomic pipeline and Python and represent that data with visuals using PyMol, Prism, Geneious, and Python extensions.
- Proved that RplD G70D increases resistance to macrolides in gonococcus, *Nature Communications* publication (2020) - "Increased power from bacterial genome-wide association conditional on known effects identifies *N. gonorrhoeae* macrolide resistance mutations in the 50S ribosomal protein L4".
- Poster Presentation Awardee at Society for the Advancement of Chicanos and Native Americans in Science (SACNAS) Conference Annual Biomedical Research Conference for Minority Students (ABRCMS).

Rural and Urban Dental Health Disparities in Southeast Louisiana, Louisiana State University Health Sciences

Center, Edward Peters, DMD, SM, SM, ScD May 2018- August 2018

- Worked with Dr. Edward Peters in this NSF funded opportunity researching dental health disparities in Southeast Louisiana.
- Worked with a local nonprofit organization, Eat Move Grow, collecting qualitative data through site visits and quantitative data from over 10 years of dental sealant screening data.
- Made weekly visits to different elementary schools to collect qualitative data and to educate children over dental hygiene and nutrition.
- Utilized a RedCap database to enter nearly 1000 sealant screening documents and shadowed a graduate student to analyze data over SAS.
- Won second in the summer student research symposium. Acknowledgement in paper.

Understanding the Pathogenicity of *Enterococcus Faecalis* in Quorum Sensing, Polysaccharide Capsule Formation, and Biofilm Formation, University of Kansas, Lynn Hancock Ph.D. September 2017 – September 2018

- Transformed *E. faecalis* with a plasmid and tested the ability to transmit pheromones with different fragment lengths.

- The fragments investigated a protein that recruits RNA Polymerase located just upstream of the RNAP, gradually cutting closer to the protein and RNAP.

Epidemiology of Crimean Congo Hemorrhagic Fever Using Differential Calculus, University of Kansas,

Folashade Agosto Ph.D.

November 2016 – May 2017

- Predicted disease trends of Crimean Congo Hemorrhagic Fever (CCHF) in humans and ticks using compartmental SEIR (Susceptible, Exposed, Infected, Recovered) models, MatLab, and handwritten differential equations based on the SEIR model.

SEA-PHAGES Through KU and the Howard Hughes Medical Institute, University of Kansas,

Robert Ward Ph.D.

August 2016 – May 2017

- **Semester 1:** Discovered and classified an F Cluster bacteriophage that infects *Mycobacterium Smegmatis* by collecting an outdoor sample, amplifying, isolating, and comparing the bacteriophage with others on the Phagesdb database.
- **Semester 2:** Isolated a single morphology of a phage then sequenced and identified protein function through DNAMaster to annotate genome.
- **My project:** determining heteroimmunity and homoimmunity in phage cluster J, includes bioinformatics and wet lab. My partner and I developed a series of experiments based on lysogeny and spot testing to compare the immunity of J cluster phage Thibault with the other J cluster phages.

PROFESSIONAL EXPERIENCE

KU Student Housing, Resident Assistant

December 2017 – December 2018

- Maintained safety, health, inclusion, and academic success on my designated floors from freshman to seniors.
- Engaged residents, built community, and responded to crisis.

Microbiology, Biology 402, Microbiology Prep Lab Assistant

August 2017 – January 2018

- Created solutions and plates, filled tip boxes, and autoclaved waste. Taught techniques and clarified methodologies of common microbiological practices.

DIVERSITY, EQUITY, AND INCLUSION LEADERSHIP EXPERIENCE

Emory Diversifying Graduate Education (EDGE), Ambassador, Emory University

September 2021 - Current

- Outreach in Atlanta to educate students about STEM, graduate school, and diversity, equity, and inclusion.
- Ambassador to first generation and historically underrepresented minority undergraduate students within, and outside of Emory, providing advice and education to students interested in pursuing graduate education.

Alchemists Anonymous, Writer and Contributor, Dr. Asia Bright

March 2020 - Current

- Writer of popular science think pieces and approachable science answers to the questions of the public.
- Recruitment of guest writers who are underrepresented people in science, prioritizing Black women and queer people of color.
- Live discussion over “walking the tight rope” as a black woman in science. The tight rope as a woman of color is balancing the perception and expression of femininity and race in the workplace in the attempt of acquiring and maintaining respect from colleagues.

Initiative for Maximizing Student Development (IMSD), Mentor, Emory University

August 2020 - May 2021

- Mentor to historically represented undergraduate students interested in earning a graduate degree in a STEM related field.
- Consistently met with undergraduate students about degree progress, mental health, and consulted with students on various applications.

Multicultural Scholars Program, Graduate Mentor and Panelist, University of Kansas

August 2020 - May 2021

- Mentor to historically represented undergraduate students interested in earning an undergraduate degree at the University of Kansas.

- As a panelist I answered student questions about resources and personal experiences at the University of Kansas. Provided advice and resources for graduate school applications.
 - Consistently met with undergraduate students about degree progress, mental health, and consulted with students on various applications.
- Office of Multicultural Affairs, Faculty Search Committee, University of Kansas** December 2019 - March 2020
- Met with various potential faculty to fill the position of LGBTQ+ Office Director.
 - Volunteer for various tasks and student recruitment at the Office of Multicultural Affairs.
- Colors of KU, Camp Counselor and Facilitator, University of Kansas** February 2020
- Facilitator of several conversations regarding race, gender, sexuality, and socioeconomic students with students of various backgrounds.
 - Constructed simulation activities, facilitated difficult conversations regarding identity politics, and managed student health and wellbeing.
- Black and STEM, Founder and President, University of Kansas** May 2019 – May 2020
- Created this organization to give Black students and faculty a supportive and informative environment to talk about science opportunities and build community.
 - Created a link for students to Black faculty in STEM and a link to mentors in the Office of Multicultural Affairs.
- Out in STEM (oSTEM), Presenter and Secretary, University of Kansas** May 2019 - May 2020
- QueerX (like TedX) presentation entitled Micro-organisms and Micro-aggressions, presenting the concept of microaggressions to a largely queer white community. Microorganisms can acquire in the body until the microbe-load is high enough to infect a larger organism. Microaggressions can build in the body and plague the body like an infection, mentally and physically.
 - As secretary, I kept meeting notes, managed social media, facilitated meetings, and contributed meeting ideas.
- KU Public Health Brigade, Director and Founder, University of Kansas** August 2016 - June 2017
- Recruited members to travel to Nicaragua and participate in community improvement projects.
 - Managed safety, wellness, flights, and transportation for a group of 15 young adults.
 - Built sanitation stations, created and laid concrete, and dug trenches for pipes, and gave public health and hygiene lessons for one week in a Nicaraguan community.
- Jayhawks Breaking Barriers, Presenter and Mentee, University of Kansas** January 2017 - May 2017
- Created an infographic about disparities of women in STEM, then presented this research to organizational mentors, donors, and partners at our symposium where we were all named STEM Leadership Ambassadors.
 - Reached out to a post-doctoral student mentor and an industry employee in Kansas City for career advice and for infographic advice.
- Youth Leadership Exchange (YLX), Student Philanthropist, Oklahoma City, OK** August 2015 – May 2016
- Collaborated with other students to find a charity in need of financial aid.
 - Liaised with representatives of the foundations to raise the necessary funds.
 - Met with officials of nonprofit organizations to determine why they needed our help and what use their funds would have on the community.

HONORS AND AWARDS

Emory University

2020

- Centennial Scholars Fellowship
- Initiative for Maximizing Student Development NIH Fellowship

University of Kansas

2020

- Graduation with University Honors
- Graduation with Molecular Biology Departmental Honors
- Tradition of Excellence, Service and Academic Award
- Be U at KU Activism Award
- Mary Townsend Volunteer Award

2019

- Poster Presentation Awardee - Society for the Advancement of Chicanos and Native Americans in Science (SACNAS)
- Poster Presentation Awardee - Annual Biomedical Research Conference for Minority Students (ABRCMS)

2018

- McNair Research Scholar (2018-2020)
 - Poster Presentation Awardee - LSUHSC REU Summer Symposium
 - College of Liberal Arts and Sciences Honor Roll
- 2017

- Initiative for Maximizing Student Development NIH Fellowship (2017-2020)
- University Honors Program (2017-2020)
- Honors Opportunity Award Winner (2017-2019)
- Jayhawks Breaking Barriers, STEM Leadership Ambassador

2016

- Multicultural Scholars Program Natural Sciences and Math Scholar (2016-2020)
- KU Excellence Scholar (2016-2020)
- President's Volunteer Service Award
- Ronald McDonald House Scholar

PUBLICATIONS

Ma, K.C., Mortimer, T.D., **Duckett, M.A.** et al. Increased power from conditional bacterial genome-wide association identifies macrolide resistance mutations in *Neisseria gonorrhoeae*. *Nat Commun* 11, 5374 (2020). <https://doi.org/10.1038/s41467-020-19250-6>

PRESENTATIONS (O = oral, P = poster, *= Awardee)

Duckett, M.A., (2021) Pharmacognosy In The Quave Lab: Isolating Medicinal Compounds. *Emory Initiative for Maximizing Student Development (IMSD) Virtual Symposium*, Atlanta, GA. O*.

Duckett, M.A., Ma, K.C., Mortimer, T.D., Grad, Y.H., (2019). RplD G70D Increases Macrolide resistance in *Neisseria gonorrhoeae*. *ABRCMS 2019*, Anaheim, CA. P*.

Duckett, M.A., Ma, K.C., Mortimer, T.D., Grad, Y.H., (2019). RplD G70D Increases Macrolide resistance in *Neisseria gonorrhoeae*. *SACNAS 2019*, Honolulu, HI. P*.

Duckett, M.A., Ma, K.C., Mortimer, T.D., Grad, Y.H., (2019). RplD G70D Increases Macrolide resistance in *Neisseria gonorrhoeae*. *Harvard School of Public Health Summer Student Symposium*, Boston, MA. P.

Duckett, M.A., Roberts, J.R. (2019). Genetic and Physiologic Diversity in Microbial Mats: An Investigation of a Microbiome and Surrounding Sediment In Guanica, Puerto Rico. *University of Kansas Student Research Symposium*. Lawrence, KS. P.

Duckett, M.A., Roberts, J.R. (2019). Genetic And Physiologic Diversity In Microbial Mats: An Investigation of a Microbiome and Surrounding Sediment In Guanica, Puerto Rico. *University of IMSD Student Research Symposium*. Lawrence, KS. P.

Duckett, M.A. (2019). Microorganisms and Microaggressions. *University of Kansas QueerX Talks*. Lawrence, KS. O.

Duckett, M.A., Peters, E.S., (2018). Rural and Urban Oral Health Disparities of Children in Louisiana. Louisiana State University Health Sciences Center. *ABRCMS 2018*. Indianapolis, IN. P.

Duckett, M.A., Peters, E.S., (2018). Rural and Urban Oral Health Disparities of Children in Louisiana. *Louisiana State University Health Sciences Center Summer Student Symposium*. New Orleans, LA. P*.

Duckett, M.A., Keffler, E.C., Hancock L.E., (2018). Transcriptional Control of EF2863, A Known Glycosyl Hydrolase in *Enterococcus faecalis*. *University of Kansas Student Research Symposium*. Lawrence, KS. P.

Duckett, M.A., Keffler, E.C., Hancock L.E., (2018). Transcriptional Control of EF2863, A Known Glycosyl Hydrolase in *Enterococcus faecalis*. *University of Kansas IMSD Student Research Symposium*. Lawrence, KS. P.

Duckett, M.A., Imel, S., Ward, R., (2017). Two studies on immunity: Thibault as an exception to homoimmunity in J cluster phages and an attempt to identify phage communication in *Mycobacterium smegmatis*. Howard Hughes Medical Institute SEAPHAGE National Conference. Janelia, KS, P.

Duckett, M.A., Imel, S., Ward, R., (2017). Two studies on immunity: Thibault as an exception to homoimmunity in J cluster phages and an attempt to identify phage communication in *Mycobacterium smegmatis*. University of Kansas SEAPHAGES Student Symposium 2017. Lawrence, KS, P.