

James Mungin PhD

Philadelphia, PA

EDUCATION

Meharry Medical College

PhD, Biomedical Sciences

Dissertation: Elucidating Molecular Mechanism of Zika Virus Vaginal Transmission

Nashville, TN

2015-2022

Tuskegee University

BS, Animal, Poultry, and Veterinary Sciences

magna cum laude

Tuskegee, AL

2009-2013

TEACHING AND TRAINING EXPERIENCE

Tuskegee University, Department of Biology

Co-Instructor: Cell and Molecular Biology (Spring 2024)

Co-lectured undergraduate course that introduces students to the chemical basis of life, concepts of the morphology and physiology of cell membranes, cellular organelles and basic genetic principles. Assessed and graded student exams.

Tuskegee University, Department of Agricultural and Environmental Sciences

Virtual Training Educator and Laboratory Instructor: National Bio and Agro-Defense Facility (NBAF) Laboratorian Training Program (Summer 2023-Present)

Delivered in-person summer laboratory training in molecular biology (western blot analysis, PCR, ELISA, and immunohistochemistry), microbiology (gram staining, bacterial identification, and storage), and animal handling techniques to undergraduates and recent graduates. Developed and instructed virtual courses that incorporated essential skills in scientific communication and professional development. Successfully trained over 300 undergraduate and recent graduate students for virtual courses.

Instructor (Virtual and In-Person): Medical Vocabulary (Spring 2025)

Provided in person and virtual course instruction on medical vocabulary course covering essential terminology, anatomical terms, and disease classifications. Engaged students through interactive lectures, case studies, and assessments to enhance their proficiency in medical terminology.

Co-Instructor, Immunology and Farm Animal Diseases (Fall 2023; Fall 2024)

Co-lectured a specialized course on pathophysiology, prevention, and treatment of common diseases in livestock. Designed and developed the laboratory curriculum, creating hands-on activities and experiments that were relevant to real-world agricultural applications.

Guest Lecturer, Reproductive Physiology (Fall 2024)

Prepared and delivered a guest lecture on female reproductive system for undergraduate students.

Co-Instructor, Animal and Poultry Science Orientation (Fall 2023)

Co-lectured undergraduate courses on the fundamentals of animal agriculture, collaborating with faculty to deliver course content covering livestock production and agricultural practices. Assessed and graded student reports, assignments, and exams. Supported students' professional development by offering academic guidance and mentorship throughout the course.

Meharry Medical College, Department of Microbiology, Immunology, and Physiology

Guest Lecturer: Fundamentals in Virology (Fall 2020; Fall 2021)

Prepared and delivered a guest lecture on flaviviruses for graduate students.

PROFESSIONAL EXPERIENCE

United States Department of Agriculture

Program Coordinator; Supervisor: Olga Bolden-Tiller

Tuskegee, AL

2023 – 2025

Manage a comprehensive laboratorian training program, ensuring the effective delivery of technical and professional development training for student participants. Developed and organized training schedules, overseeing the logistics of sessions, workshops, and practical exercises for participants. Maintained accurate records of program outcomes, designed program evaluation surveys, and provided regular reports to stakeholders on program performance and participant achievement. Designed promotional materials and developed a program website to enhance participant engagement and accessibility. Managed the procurement of lab supplies and materials for training sessions and maintaining inventory.

RESEARCH EXPERIENCE

Tuskegee University

Postdoctoral Associate; Advisor: Olga Bolden-Tiller

Tuskegee, AL

2023 – 2025

Project Title: Development of Computer Vision and Machine Learning Tools for Automated Assessment of Goat Behavior

The objectives of this project are to: (1) generate large datasets that capture animal behavior patterns through computer-based tracking and detection systems, (2) develop algorithms that identify and predict behavioral patterns in meat goats, and (3) establish standardized procedures for data collection using these tracking technologies. The project seeks to leverage artificial intelligence tools to improve animal health assessments, enabling animal producers to make informed decisions without requiring expertise in machine learning.

Emory National Primate Research Center

Postdoctoral Scholar; Advisor: Rama Amara, Tiffany Styles

Atlanta, GA

2022 – 2023

Project Title: Investigate Immunological Mechanisms Driving Persistent Antibody Responses Post-Influenza Universal Vaccination

Managed a project aimed at identifying specific transcriptomic and receptor signatures associated with the generation and induction of long-lived plasma cells in the bone marrow following mRNA-LNP vaccination encoding chimeric hemagglutinin antigens.

Meharry Medical College

Doctoral Candidate; Preceptor: Bindong Liu

Nashville, TN

2015 – 2022

Project Title: Elucidate the Molecular Mechanism of Zika Virus (ZIKV) Vaginal Transmission

This project aims to (1) validate ZIKV infection and replication in human vaginal epithelial cells, (2) investigate the role of the ZIKV entry receptor AXL, and (3) assess the antiviral effects of interferon epsilon and signaling in infected cells. The thesis will enhance understanding of host-virus interactions and inform potential therapeutic strategies for ZIKV-related pathology.

Albert Einstein College of Medicine

Postbaccalaureate Scholar; Advisor: Duncan Wilson

Bronx, NY

2014 – 2015

Project Title: Investigate Viral assembly of Herpes Simplex Virus during early infection.

The project studied the role of herpes simplex virus (HSV) tegument protein UL56, involved in vesicular trafficking during infection. Using a pseudorabies (PrV) model, the project aimed to analyze viral release over time in wild-type and UL56-deficient strains.

Washington University in Saint Louis

Amgen Scholar; Advisor: Barbara Kunkel

Saint Louis, MO

2012

Project Title: Molecular biology of plant-pathogen interactions using Pseudomonas syringae model system.

The objective was to generate a mutant library of *P. syringae* and screen it for auxin deficiency. We sought to determine if auxin contributes to bacterial virulence and disease susceptibility in its host. At the end of the program, I generated over 100 Tn5 transposon insertion mutants.

Tuskegee University

Research Fellow; Advisor: Mohamed Abdalla

Tuskegee, AL

2011 – 2013

Project Title: Development of peptide guided nanoparticles as therapeutic agents for prostate cancer.

The objective was to develop and biologically evaluate Luteinizing Hormone Releasing Hormone (LHRH)-guided nanoparticles for prostate cancer treatment. In the final stages of my research, I designed and optimized a protocol for preparing single-receptor-targeted iron oxide nanoparticles (IONPs). The LHRH peptide successfully coupled to the polymer coating of the IONPs, forming LHRH-IONPs. Prussian blue staining confirmed the effective binding of LHRH-IONPs to prostate cancer PC-3 cells.

Purdue University

SROP Scholar; Advisor: April Johnson

West Lafayette, IN

2011

Project Title: Agricultural epidemiology of Q-fever in the state of Indiana.

The objective was to estimate the prevalence of *Coxiella burnetii*, the causative agent of Q-fever, from milk samples of Indiana dairy goats. Our findings indicated that six percent of farms tested positive for *C. burnetii* from milk samples. Interestingly, our data showed 90 percent of farmers admitted to using raw milk for pet and human consumption. These results highlight active *C. burnetii* transmission among the goat herds, and the urgency to establish educational programs on Q-fever to the public.

PRESENTATIONS

2025

Poster Presentation: James Mungin, Christian Peterson, Jasmine Boone, Olga Bolden-Tiller, “Developing an SOP for Goat Behavioral Monitoring using Computer Vision and Machine Learning: A Practical Guide for Agricultural Workers,” 2025 Center for Digital Agriculture Conference, Champaign, IL

Oral Presentation: James Mungin, Olga Bolden-Tiller, “National Bio and Agro- Defense Facility Laboratorian Training Program,” 2025 International Symposium on Transboundary and Emerging Zoonotic Diseases, Manhattan, KS

2024

Poster Presentation: James Mungin, Christian Peterson, Olga Bolden-Tiller, “Improved Detection Method of Estrus Behaviors in Individually Housed Kiko Goats Using YOLOv8,” 2024 Society for the Study of Reproduction Annual Meeting, Dublin, IE

Poster Presentation: James Mungin, Olga Bolden-Tiller, “Expanding Career Interest in High Biocontainment Laboratory Related Fields for Underrepresented Students: Outcome Assessment of the NBAF Laboratorian Training Program at Tuskegee University,” 2024 1890 Symposium; Association of 1890 Research Directors, Nashville, TN

2023

Poster Presentation: James Mungin, Olga Bolden-Tiller, “Increasing Underrepresented Minority (URM) Participation in High Biocontainment Laboratory Careers: Outcome Assessment of The NBAF Laboratorian Training Program at Tuskegee University,” 2023 Professional Agriculture Workers Conference, Montgomery, AL

Guest Speaker: James Mungin, Olga Bolden-Tiller, "Orientation to the NBAF Laboratorian Training Program," 2023 Tomorrow's Agricultural Professional Symposium, Tuskegee, AL

2021

Panelist: James Mungin, Tameka Greer, Michelle Taylor, Tekita McKinney, Elizabeth Hart, "COVID Conversations: An Honest Conversation About Vaccines," 2021 Black Lives Matter Memphis, Memphis, TN

2020

Oral Presentation: James Mungin, Bindong Liu, "Human Vaginal Epithelial Cells are Susceptible to the Zika Virus: Implications for Zika Vaginal Transmission," 2020 Experimental Biology National Conference, San Diego, CA

2019

Poster Presentation: James Mungin, Bindong Liu, "Human Vaginal Epithelial Cells are Susceptible to Zika Virus," 2019 Research Centers for Minority Institutions National Conference, Bethesda, MD

Poster Presentation: James Mungin, Bindong Liu, "Zika Virus Infection in Human Vaginal Epithelial Cells Promotes Zika Sexual Transmission", 2019 Meharry Medical College Research Day Symposium, Nashville, TN

2018

Poster Presentation: James Mungin, Bindong Liu, "Biology of Zika Virus Infection in Human Vaginal Epithelial Cells", 2018 Meharry Medical College Research Day Symposium, Nashville, TN

Poster Presentation: James Mungin, Bindong Liu, "Zika Virus Infects Human Vaginal Epithelial Cells: Implications of Sexual Transmission", 2018 Vanderbilt Institute for Infection, Immunology and Inflammation Annual Symposium, Nashville, TN

Poster Presentation: James Mungin, Bindong Liu, "Biology of Zika Virus Infection in Human Vaginal Epithelial Cells", 2018 Meharry Translational Research Center (MeTRC) Conference, Nashville, TN

PUBLICATIONS

Mungin JW Jr, Chen X, Liu B. Interferon Epsilon Signaling Confers Attenuated Zika Replication in Human Vaginal Epithelial Cells. *Pathogens*. 2022 Jul 29;11(8):853. doi: 10.3390/pathogens11080853. PMID: 36014974; PMCID: PMC9415962.

Dykema PE, Stokes KD, Beckwith NR, **Mungin JW**, Xu L, Vickers DJ, Reising MM, Bravo DM, Thomsen BV, Robbe-Austerman S. 2016. Development and validation of a direct real-time PCR assay for *Mycobacterium bovis* and implementation into the United States national surveillance program. *PeerJ PrePrints* 4:e1703v1 <https://doi.org/10.7287/peerj.preprints.1703v1>

MEDIA COVERAGE

1. EurekAlert. (n.d.). **Scientists uncover how Zika virus can spread through sexual contact**. Retrieved August 31, 2020, from https://www.eurekalert.org/pub_releases/2020-04/eb-suh042320.php

2. Mungin, J., & Liu, B. (2020, April 19). **Human Vaginal Epithelial Cells are Susceptible to the Zika Virus: Implications for Zika Vaginal Transmission.** Retrieved August 31, 2020, from <https://faseb.onlinelibrary.wiley.com/doi/abs/10.1096/fasebj.2020.34.s1.07170>
3. **Zika Virus Can Spread Vaginally** . (n.d.). Retrieved August 31, 2020, from <https://www.zikanews.com/zika-virus-particles-were-able-successfully-enter-vaginal-epithelial-cellsthrough-ufo-receptor>
4. **Zika virus may spread through sexual contact, claims study.** (2020, April 28). Retrieved August 31, 2020, from <https://www.hindustantimes.com/sex-and-relationships/zika-virus-may-spread-through-sexual-contact-claims-study/storyJ1MhliRaEDwmwFDSBvrOaO.html>
5. Shapiro, Marissa. "**Meharry Team among Those Accepted to the NSF Innovation Corps for Work Developed through Vanderbilt's Innovation Center, the Wond'ry.**" Vanderbilt University, Vanderbilt University, <https://news.vanderbilt.edu/2021/02/05/meharry-team-among-those-accepted-to-the-nsf-innovation-corps-for-work-developed-through-vanderbilts-innovation-center-the-wondry>
6. Santora, Tara. "**How Four Transgender Researchers Are Improving the Health of Their Communities.**" *Nature News*, Nature Publishing Group, 26 Nov. 2021, <https://www.nature.com/articles/s41591-021-01597-y>.
7. "**TU Launches a Training Program that Aims to Increasing Underrepresented Minority (URM) Participation in High Biocontainment Laboratory Careers.**" Tuskegee University, <https://www.tuskegee.edu/programs-courses/colleges-schools/caens/caens-news/underrepresented-minority-urm-careers>

GRANT AND AWARDS

Innovation Corps Grant Awardee	2021
National Science Foundation	
The Mary Hetherington Lutz Memorial Scholarship Award	2021
Meharry Medical College	
George H. Howard Jr. Memorial Scholarship Award	2018
Meharry Medical College	
The Mable Floyd Endowed Memorial Scholarship Award	2018
Meharry Medical College	