



**26th Annual One Health
Symposium
13th Annual Phi Zeta
Research Day**

**THEME - One Health: Uniting
Human, Animal, and Environmental
Health for Sustainability**

2025

SEPTEMBER

15th

**9:00 A.M. – 4:30 P.M.
ONE HEALTH
SYMPOSIUM**

SEPTEMBER

16th

**9:00 A.M. – 4:30 P.M.
PHI ZETA**

**Patterson Hall
Auditorium**

**College of Veterinary
Medicine**

One Health involves everyone.



Working together is key
to One Health.

Dr. Mark A. Brown '86
10th President and CEO of Tuskegee University



Dr. Mark Brown was appointed the tenth president and CEO of Tuskegee University. His tenure began on July 1, 2024. Dr Brown's selection was the first time in Tuskegee's nearly 143-year history that an alum was selected to lead the university. The retired Air Force Major General agreed to take the helm after the retirement of Dr. Charlotte P. Morris, the university's ninth president.

His extensive executive experience includes the Harvard University Kennedy School of Government, the University of Virginia Darden School of Business, and the Eli and Edythe Broad Academy for Urban School Superintendents, now hosted at the Yale School of Management. Dr. Brown, who received his bachelor's from Tuskegee in accounting in 1986, earned a Master's Degree in Public Administration from Troy University, a Master's of Strategic Studies from the Air Command and Staff College, a Master's in National Security Strategy from the National War College, and his doctorate in Education from Baylor University. His experience in education is varied and distinguished.

While a Major General in the Air Force, Dr. Brown served as Deputy Commander of Air Education and Training Command, Joint Base San Antonio-Randolph, Texas. AETC recruits, trains, and educates Air Force personnel. His command included the Air Force Recruiting Service, two numbered Air Forces, and two fully accredited graduate and doctoral degree-granting universities: Air University and the Air Force Institute of Technology. AETC operates more than 1,400 trainer, fighter, and mobility aircraft, 23 wings, 10 bases, and five geographically separated groups. The command trains more than 293,000 Airmen annually, with approximately 60,000 active-duty, Reserve, Guard, civilian, and contractor personnel.

After retiring from the Air Force with 32 years of service, Dr. Brown expanded his educational service as the chief operating officer of the U.S. Department of Education Office of Federal Student Aid, which had a lending portfolio of \$1.7 trillion equivalent to that of the nation's five largest consumer lending banks. As COO, he was responsible for all of the nation's Title IV funding. Most recently, he has served as president and chief executive officer of the Student Freedom Initiative based in Washington, D.C. The Student Freedom Initiative is the vision of billionaire philanthropist Robert F. Smith after his historic gift to eliminate the student loan debt of the Morehouse College class of 2019.

As the first President and Chief Executive Officer, he and his staff provide four components to 63 HBCUs, which also includes two Tribal Colleges and Universities and Minority Serving Institutions. The capabilities include agreements to fund any educational attendance requirements beyond what is paid for through Federal programs, such as Pell Grants, Work-Study, and Federal Student Loans. SFI is also focused on elevating the communities around its school by providing critical resources such as access to highspeed broadband, cybersecurity upgrades, affordable living spaces and solar energy.

Dr. Brown was commissioned through the Tuskegee University Air Force ROTC program in 1986. He served in comptroller, command, and staff positions at all U.S. Department of Defense levels, including two assignments as congressional liaison to the United States House of Representatives.

His global experience includes serving in the Philippines, Spain, England, Turkey and Iraq. In addition, he has commanded four times at ascending levels, deploying in support of operation Provide Comfort, and served as the Assistant Executive Officer for the 17th Air Force Chief of Staff. He was also the Financial Management Senior Military Assistant in the Office of the Secretary of Defense and Chief Financial Officer for Air Force Materiel Command, responsible for a portfolio greater than \$60 billion, 38 percent of the Air Force budget.

Dr. Brown is married to Gwendolyn Jackson Brown, his wife of 33 years. They have two adult children, Mark II and Michael.



TUSKEGEE UNIVERSITY

OFFICE OF THE PRESIDENT



Dear Colleagues, Guests, and Friends,

It is with great pleasure and pride that I welcome you to the 26th Annual One Health Symposium and the 13th Phi Zeta Research Day at Tuskegee University. This year, the theme, "One Health: Uniting Human, Animal, and Environmental Health for Sustainability," reflects our shared commitment to advancing knowledge that improves lives and strengthens communities locally and globally.

For more than a quarter of a century, this symposium has served as a dynamic platform for exchanging ideas, presenting groundbreaking research, and fostering collaborations that transcend disciplines and borders. It reflects Tuskegee University's enduring dedication to advancing science, education, and the betterment of humanity.

At Tuskegee, the commitment to research is ongoing. Today, as in years past, we conduct research that solves the world's most complex problems whether tackling polio, poverty, food insecurity, hypertension, or cancer. While our work has global reach, it is directly impacting the lives of families in the Black Rural South, where over 1.6 million people of color reside.

Like those of you gathered here, the key to our research success is the dedication of visionary leaders, scholars, and students who recognize the vital interconnectedness of human, animal, and environmental health. These legacies honors our past but also pushes the boundaries of innovation to meet the most pressing challenges of our time.

As we gather for this year's symposium, we are reminded that the world still needs Tuskegee for the global impact we make every day. This event is a testament to our shared mission to unite disciplines, bridge communities, and make a lasting impact on global health and sustainability.

I extend my deepest gratitude to all who have contributed to making this symposium a success—our organizers, speakers, sponsors, and participants. Your dedication to advancing knowledge and fostering collaboration is the cornerstone of our progress.

Thank you for joining us as we celebrate 26 years of excellence in One Health research and innovation. I look forward to the inspiring conversations and discoveries that will emerge from these two days together.

Sincerely,

Dr. Mark A. Brown, '86
President and CEO

Thierno Thiam, PhD

Provost and Senior Vice President for Academic Affairs Tuskegee University



Dr. Thierno Thiam was selected as the new Provost and Senior Vice President for Academic Affairs effective February 3, 2025.

Dr. Thiam is returning to Tuskegee after most recently serving as the Provost and Chief Academic Officer for Johnson C. Smith University in Charlotte, North Carolina,” said Dr. Brown. “Dr. Thiam is empowered to do a full review of the Academic offerings at Tuskegee to ensure we remain aligned with societal trends in skills and employment needs in industry and government. In addition, Dr. Thiam will have an intense focus on our road map to being a high research-based university with R2 status as well as our desire to grow our undergraduate international student population.”

Previously while at Tuskegee, Dr. Thiam served in many capacities, including as Special Advisor to two Tuskegee University presidents, as a full tenured professor, as Chair of the Department of History and Political Science, and as Co-Director of the Integrative Public Policy and Development Ph.D. program.



COLLEGE OF VETERINARY MEDICINE
Office of the Dean



Dear Colleagues, Students, and Guests,

It is my pleasure to extend warm greetings on behalf of the Tuskegee University College of Veterinary Medicine as we proudly host the 26th Annual One Health Symposium and the 13th Annual Phi Zeta Research Day.

The One Health Symposium celebrates the One Health Triad, which highlights the interconnectedness of human, animal, and environmental health. This year's theme, *"One Health: Uniting Human, Animal, and Environmental Health for Sustainability,"* reflects Tuskegee University's enduring commitment to tackle real-world challenges and advance initiatives that foster healthy people, healthy animals, and a healthier world.

This annual symposium highlights our College's dedication to advancing biomedical research, fostering interdisciplinary collaboration, and addressing global health issues—including health disparities, often driven by socioeconomic, environmental, and systemic factors. Over the course of this event, participants will hear from distinguished speakers, engaged faculty, and motivated students across a wide range of disciplines—all united in promoting the One Health initiative with a focus on sustainable practices. By adopting holistic approaches to health and well-being, we can reduce inequities and strengthen the foundation of public health. In addition to showcasing real-world applications of One Health, the symposium will highlight innovative research and applications that underscore the creativity and impact of the Tuskegee community.

We are especially proud to feature the Phi Zeta Research Day as a platform for our students to share their scholarly work through oral and poster presentations. Their dedication and contributions reflect the future of research, veterinary medicine, and public health, and we commend their accomplishments.

I would like to express my sincere appreciation to the One Health Symposium Co-Chairs, Dr. Teshome Yehuaeshet, Professor of Microbiology, and Dr. Lloyd Webb, Professor of Public Health and the Phi Zeta Research Day Co-Chairs, Dr. Toufic Nashar, Professor of Microbiology and Pathobiology Department Head and Dr. Pawan Puri, Associate Professor of Physiology. I also extend my gratitude to the committee members, judges, participants, and attendees for your invaluable roles in making this event possible.

As a College, we remain committed to promote interdisciplinary research, advance healthcare delivery, and prepare the next generation of scientists, public health leaders, and veterinarians. This symposium serves as an important platform to exchange ideas, build partnerships, and connect with our collegial and social communities.

Thank you for joining us for this year's One Health Symposium and Phi Zeta Research Day. I look forward to the meaningful discussions and collaborations that will emerge.

Sincerely,

Dr. Ebony Gilbreath

Interim Dean, Tuskegee University College of Veterinary Medicine

1200 West Montgomery Road | Patterson Hall, Rm # 201 | Tuskegee, Alabama

Phone: 334-727-8764 | Fax: 334-727-8177

www.tuskegee.edu

Lawrence “Tony” Haygood, Jr.

Mayor, City of Tuskegee, Alabama



In August 2016, Lawrence “Tony” Haygood, Jr. was elected Mayor of the City of Tuskegee, Alabama. Prior to that time, he served four years on the Tuskegee City Council as Councilman-at-Large, Mayor Pro Tem. The previous Governor appointed Mayor Haygood to the Alabama Workforce Development Board in 2016 where he continues to serve to date. He also currently serves on the River Region United Way Board. In 2020, Mayor Haygood was selected as Chairman of the Board of the Alabama Municipal Funding Corporation (AmFund). In 2022, Mayor Haygood was elected to serve as President of the Alabama League of Municipalities.

Currently, Haygood serves as Chairman of at the Tuskegee-Macon County Community Development Corporation (TMCDC). As Economic/Business Development Specialist, he works closely with the Tuskegee University Cooperative Extension Program and TMCDC staff to promote business

and industrial development, launch improvement efforts for community corridors, coordinate housing rehabilitation projects, conduct entrepreneurial training, and manage a business incubator with a community revolving loan fund. As a grant writer, he also works with TUCEP and TMCDC staff to acquire substantial grant funding for community programs.

Haygood was Vice-Chairman of the Historically Black Colleges and Universities (HBCU) Community Development Action Coalition (CDAC) national board. Earlier, Haygood served as President of Southern Community College for more than 20 years.

Additionally, Haygood served as a local tour guide and planner for Tuskegee tourism. Haygood was selected as the Alabama State Tree Farmer of the Year in 1998 and received the Tuskegee University Merit Farm Family award in 2005 at the 113th Tuskegee University Annual Farmer’s Conference.

A member and past president of Alpha Nu Lambda Chapter of Alpha Phi Alpha Fraternity, Inc. Haygood was selected to receive the Alpha Man of the Year Award in 2017 by the Gamma Phi undergraduate chapter at Tuskegee University.

Haygood received his undergraduate degree at Rhodes College with a major in Political Science and a minor concentration in Economics. He received a Master of Business Administration degree from Auburn University Montgomery with additional studies in Management Science at Krannert School of Management at Purdue University in West Lafayette, Indiana and The Georgia Institute of Technology in Atlanta, Georgia. In the summer of 2011, Haygood completed the Intensive Economic Development Training Course at Auburn University in Auburn, Alabama.



COLLEGE OF VETERINARY MEDICINE



It is a pleasure for us to welcome you to the 26th Annual One-Health Symposium and the 13th Phi Zeta Research Day. The College of Veterinary Medicine at Tuskegee University, is pleased to partner with other colleges and schools on campus to host this event that focuses on the theme: **“One Health: Uniting Human, Animal, and Environmental Health for Sustainability.”** The members of the One-Health Planning Committee have provided you with an exciting program. We have brought together researchers, academicians, diverse community leaders and members, undergraduate and graduate students, and our distinguished vendors so that today’s events will expand your knowledgebase about the importance of the One-Health approach and its role in promoting sustainability in community health.



We acknowledge the support of Dr. Mark Brown, our 10th President of Tuskegee University, his senior Cabinet members, and other leaders from Tuskegee University. We are excited about support from the wider community, especially from Macon County. Let us work together to identify a clear and concrete pathway and take appropriate actions that can lead to positive possibilities for greater health sustainability for all people at the local, state, national, and even international levels. We can use this multidisciplinary approach to apply firsthand, unique perspectives on humans, animals, and the environment as we seek to attain better community health outcomes.

We can achieve health sustainability by addressing cross-cutting issues in a One-Health approach. Let us keep in mind that health is a “state of complete physical, mental, and social well-being, and not merely the absence of disease or infirmity.” Our commitment can help us address health issues that are cultural, technical and non-technical, economic, and social and lead to important health outcomes for marginalized and vulnerable people in a fast-changing world as we adopt plans and strategies aimed at making the overall health of our people much

better.

We sincerely wish to thank the following individuals for their continuous support throughout the enlightening and thought-provoking planning process: Dr. Ebony Gilbreath, Interim Dean of the College of Veterinary Medicine; Dr. Temesgen Samuel, Associate Dean for Research and Advanced Studies; and Dr. David Hodge, Director of the National Center for Bioethics, Research, and Health Care. We will measure our success as our people achieve better health, and we leverage existing programs and redefine actions for building capacity to improve the health of the population.

Sincerely,

Lloyd A.W. Webb, MPH, DVM
Professor, Public Health
Co-chair, One-Health Symposium

Teshome Yehualaeshet, DVM, PhD
Professor, Pathobiology
Co-chair, One-Health Symposium

KNOWLEDGE - LEADERSHIP - SERVICE
Tuskegee, Alabama 36088



COLLEGE OF VETERINARY MEDICINE



We are pleased to announce the upcoming 13th Annual Phi Zeta Research Day, to be held on September 16, 2025, in conjunction with the 26th One Health Symposium at the Tuskegee University College of Veterinary Medicine (TUCVM).

This year's theme, **"One Health: Uniting Human, Animal, and Environmental Health for Sustainability,"** emphasizes the growing need for interdisciplinary collaboration to solve today's most pressing global health challenges. The event will serve as a platform to explore how integrated approaches across veterinary medicine, biomedical research, public health, and environmental science can lead to sustainable solutions that benefit all life on Earth.

Organized under the leadership of Dr. Ebony Gilbreath, Interim Dean of TUCVM, and Dr. Temesgen Samuel, Associate Dean for Research and Advanced Studies, this symposium highlights TUCVM's commitment to research, education, and service. The day will feature oral and poster presentations by our talented Doctor of Veterinary Medicine (DVM) and graduate students, who will showcase their research findings across a range of scientific disciplines. Their work exemplifies the innovation, curiosity, and dedication that defines the next generation of veterinary scientists and health professionals.



In addition to student presentations, we are excited to welcome distinguished keynote speakers whose expertise in One Health and related fields will offer valuable insights and guidance to the TUCVM community. These presentations will provide context, inspiration, and real-world application to the research being conducted by our students and faculty.

We extend a warm invitation to all faculty, staff, students, alumni, collaborators, and friends of Tuskegee University to attend this important academic event. Whether presenting research, serving as a judge, or engaging in scholarly dialogue, your participation contributes to the vibrant and collaborative spirit of Phi Zeta Research Day.

We are grateful to all those who make this event possible, including our faculty mentors, committee members, judges, and generous sponsors. Your continued support ensures that we are able to provide this unique opportunity for learning, recognition, and academic growth.

We look forward to your presence as we gather to celebrate research excellence and reinforce our shared commitment to advancing health for animals, humans, and the environment.

Best Regards,

Toufic Nashar, DVM, PhD
Co-chair, Phi Zeta Research Day
Associate Professor
Department of Pathobiology

Pawan Puri, DVM, PhD
Co-chair, Phi Zeta Research Day
Associate Professor
Department of Biomedical Science

KNOWLEDGE - LEADERSHIP - SERVICE
Tuskegee, Alabama 36088

26th Annual One Health Symposium

Theme: *One Health: Uniting Human, Animal, and Environmental Health for Sustainability*

College of Veterinary Medicine, Tuskegee University

September 15, 2025

9:00 a.m. – 9:05 a.m.	Opening Session: Lloyd Webb, DVM, MPH, Co-Chair, Professor, Department of Graduate Public Health, College of Veterinary Medicine, Tuskegee University
9:05 a.m. – 9:15 a.m.	- Greetings: Mark Brown, PhD, President, Tuskegee University - Greetings: Thierno Thiam, Provost & Senior VP Academic Affairs, Tuskegee University - Welcome: Ebony Gilbreath, DVM, PhD, DACVP, Interim Dean, College of Veterinary Medicine, Tuskegee University
9:15 a.m. – 9:30 a.m.	Greetings: Lawrence F. “Tony” Haygood, Jr., MBA, Mayor City of Tuskegee
9:30 a.m. – 10:15 a.m.	Introduction of Speaker: Torhonda C. Lee, Ph.D., MCHES® - Associate Professor, Director and Head, Department of Graduate Public Health, College of Veterinary Medicine, Tuskegee University Speaker: Lindsey Ferraro, MPH, Epidemiologist, Infectious Diseases and Outbreaks Division, Alabama Department of Public Health Speaker: Alexis Hynes, MPH, Epidemiologist, Infectious Diseases and Outbreaks Division, Alabama Department of Public Health <i>One-Health: An Epidemiologist Perspective</i>
10:15 a.m. – 11:00 a.m.	Introduction of Speaker: Temesgen Samuel, DVM, PhD, Associate Dean, Research and Advanced Studies, College of Veterinary Medicine, Tuskegee University Speaker: Stephen Sodeke, BA, MS, PhD, MA, DBE, Resident Bioethicist, Center for Biomedical Research, Professor of Bioethics and Allied Health Sciences, Colleges of Arts and Sciences, Tuskegee University <i>Significance of Ethics in Health Programs: A Bioethicist Perspective</i>
11:00 a.m. – 11:15 a.m.	Introduction of Vendors: Isabella Burnett, BS, MS, Director of Student Health and Counseling Services, Tuskegee University
11:15 a.m. – 11:30 a.m.	BREAK
11:30 a.m. – 12:15 p.m.	Introduction of Speaker: Nelson O. Oranye, PhD, PSC.PHDA, MPH, MBA, MS., Associate Professor, Department of Graduate Public Health, College of Veterinary Medicine, Tuskegee University KEYNOTE SPEAKER Lloyd Webb, DVM, MPH, Professor, Department of Graduate Public Health, College of Veterinary Medicine, Tuskegee University <i>One Health Literacy: Releasing Barriers to Building Sustainability for Community Health</i>
12:15 p.m. – 1:30 p.m.	LUNCH BREAK – VISIT VENDORS TABLE & STUDENTS POSTERS
1:30 pm – 2:00 pm	Booker T. Washington High School Students Orientation - Moderator: Brandon Isome, PhD, Director of Bioethics Honors Program and Assistant to the Director, The National Center of Bioethics in Research and Health Care, Tuskegee University - Moderator: Jacob Grant, Second Year DVM Student, College of Veterinary Medicine, Tuskegee University Speaker: Astril Webb-Harewood, MD, President, Healthy Kinder International, LLC

	Speaker: Avia Sutton, MPH, MS, GC , Genetic Counselor, UT Health Austin Pediatric Neurosciences, Dell Children's Medical Center and UT Health Austin
1:30 p.m. – 3:30 p.m.	COMMUNITY SESSION <i>Topic: Creating a Shared View for Successful One-Health Interventions in Rural Communities</i> Moderator: Kim R. Ortiz, Ed.S., M.A., M.P.A. '92, Director of Alumni Engagement, Division of Development and Alumni Engagement Coordinator, Strategic Planning and Development, College of Veterinary Medicine, Tuskegee University Panel Discussion Speakers <i>Improved Collaboration and Partnerships to Address Community Concerns</i> - David Augustin Hodge, Sr., PhD, D.Min., M.Ed, M.T.S., Director (Interim), Lead Ethicist, Research Professor, The National Center of Bioethics in Research and Health Care, Tuskegee University <i>Support for a holistic approach (body, soul, and mind)</i> - Lawrence F. "Tony" Haygood, Jr., MBA, Mayor City of Tuskegee - Angel Walker, BS, MS, PhD, Executive Director of Macon-Russell Community Action Agency, Inc., CEO/owner Strategic Training and Resource Solutions (STARS) - Lucenia W. Dunn, PhD, President and CEO, Tuskegee-Macon County Foundation, Inc.
3:30 p.m. – 3:45 p.m.	BREAK
3:45 p.m. – 4:30 p.m.	Awards and Closing Remarks: Teshome Yehualaeshet DVM, PhD, Director of International Programs, Professor of Microbiology/Molecular Biology, Department of Pathobiology, College of Veterinary Medicine, Tuskegee University



13th Annual Phi Zeta Research Day
Theme: One Health: Uniting Human, Animal,
and Environmental Health for Sustainability
College of Veterinary Medicine, Tuskegee University

Tuesday, September 16, 2025

Boehringer Ingelheim Distinguished Lecture Session

9:00 a.m. – 9:03 a.m.	Opening Remarks: Pawan Puri, DVM, PhD, Co-Chair, Associate Professor, Department of Biomedical Sciences, College of Veterinary Medicine, Tuskegee University
9:03 a.m. – 9:05 a.m.	Welcome: Ebony Gilbreath, DVM, PhD, DACVP, Interim Dean, College of Veterinary Medicine, Tuskegee University
9:05 a.m. – 10:00 a.m.	Moderator: Toufic Nashar, DVM, PhD, Co-Chair, Associate Professor and Head, Department of Pathobiology, College of Veterinary Medicine, Tuskegee University Speaker: Solomon Wole Odemuyiwa, DVM, PhD, DACVM , Interim Associate Dean for Academic and Student Affairs, Professor of Pathobiology & Associate Dean for Preclinical Curriculum, College of Veterinary Medicine, Tuskegee University <i>Allergic Asthma – What Ails Man Ails His Horse?</i>
10:00 a.m. – 11:00 a.m.	KEYNOTE SPEAKER Robin L. Burke, DVM, MPH, DACLAM, DACVPM , Professor, Laboratory Animal Medicine, Attending Veterinarian, Director, Comparative Medicine Resource Center, Department of Pathobiology, College of Veterinary Medicine, Tuskegee University <i>Veterinarians without Borders: One Health Lessons from Military Medicine</i>
11:00 a.m. – 11:10 a.m.	BREAK
11:10 a.m. – 11:45 a.m.	Speaker: Yesutor K. Soku, DVM, MS , Interdisciplinary Pathobiology PhD Student, College of Veterinary Medicine, Tuskegee University <i>Hepatic Metabolic Reprogramming in Channel Catfish (<i>Ictalurus punctatus</i>) During <i>Aeromonas hydrophila</i> Infection Reflects Nutritional Regulation of Acyl-CoA, Sterol and Tri-carboxylic Acid (TCA) Pathways</i>
11:45 a.m. – 12:30 p.m.	LUNCH BREAK
12:30 p.m. – 1:50 p.m.	POSTER PRESENTATIONS Viewing: 12:30 p.m. – 1:00 p.m. First Year Veterinary Students 1:00 p.m. – 1:30 p.m. Second Year Veterinary Students
1:50 p.m. – 2:20 p.m.	Moderator: Rawah Faraj, DVM, MSc, PhD, Assistant Professor of Immunology, Department of Pathobiology, College of Veterinary Medicine, Tuskegee University Speaker: Barbara E. Eves, DVM , Specialist, Technical Publications, Purina Institute Nestlé Purina Lecture <i>Translational Research Driving Innovation in Pet Nutrition</i>
	The Zoetis Student Research Session
2:20 p.m. – 2:40 p.m.	Amber D. Cooper , Third Year DVM Student, College of Veterinary Medicine <i>Anatomical Characteristics of the Roots of Maxillary First Molar Teeth in Dogs Assessed by Computed Tomography</i>
2:40 p.m. – 3:00 p.m.	Aniyah Ragland , Second Year DVM Student, College of Veterinary Medicine <i>Pathology Unveiled: Investigating Lung Lesions through Gross and Histopathological Examinations</i>
3:00 p.m. – 3:10 p.m.	BREAK
3:10 p.m. – 3:30 p.m.	Kendall Walden , Second Year DVM Student, College of Veterinary Medicine <i>Gremlin1 Overexpression in Nephron Progenitors Impairs their Maintenance and Differentiation into Nephrons</i>

3:30 p.m. – 3:50 p.m.	Juanita Smith , Second Year DVM Student, College of Veterinary Medicine <i>Optimizing Maropitant Transdermal Delivery: Synthesis and Invitro Evaluation of Solid Lipid Nanoparticles</i>
3:50 p.m. – 4:10 p.m.	Esraa Alnahrawy , Interdisciplinary Pathobiology PhD Student, College of Veterinary Medicine <i>Investigating the Role of Protein Kinase A (PKA) Signaling in Renal Development and Cystogenesis</i>
4:10 p.m. – 4:30 p.m.	Awards and Closing Remarks: Toufic Nashar, DVM, PhD, Co-Chair, Associate Professor and Head, Department of Pathobiology, College of Veterinary Medicine, Tuskegee University



One Health Symposium Speaker

Lindsey Ferraro, MPH

Epidemiologist, Infectious Diseases and Outbreaks Division
Alabama Department of Public Health



Lindsey Ferraro is an epidemiologist in the Infectious Diseases & Outbreaks Division at the Alabama Department of Public Health. In this role, she leads both surveillance and national outbreak response for foodborne and enteric diseases, supports wastewater surveillance, and assists with other One Health activities. Ferraro has led 37 in-state and multi-state outbreak investigations of various symptomatology, including enteric zoonotic outbreaks, multi-drug resistant organisms, respiratory outbreaks, and gastrointestinal outbreaks. She also helped establish and now co-leads the Alabama One Health Work Group, which has 49 members across 12 organizations, including Tuskegee University. Ferraro graduated from the University of Alabama at Birmingham with a Bachelor of Science in Public Health and a Master of Public Health in epidemiology in 2021. She completed a graduate certificate in food safety from the University of Tennessee, Knoxville in

2023. Ferraro is an alumna of the CSTE Applied Epidemiology Fellowship program (Class XIX), where she was placed at the Tennessee Department of Health and had a primary focus in foodborne and enteric disease and a secondary focus in general infectious disease. She currently participates in the CSTE Data Science Team Training program.

This presentation highlights Alabama's engagement in One Health. We will review notable One Health-related outbreaks investigated by the Alabama Department of Public Health's Infectious Diseases & Outbreaks (ID&O) Division, with etiologies including Salmonella, norovirus, eastern equine encephalitis, and rabies. The presentation will also highlight Alabama's newly established One Health Work Group, composed of diverse public health and academic partners. The vision of this group is to create public-facing educational materials that promote community health and to provide a forum where professionals in the One Health space can connect and learn from one another. We will also share findings from pre- and post-meeting surveys to assess knowledge gained by work group members, emphasizing the group's impact on interdisciplinary learning and multi-organizational partnerships.



One Health Symposium Speaker

Alexis Hynes, MPH

Epidemiologist, Infectious Diseases and Outbreaks Division
Alabama Department of Public Health



Alexis Hynes is a public health Epidemiologist in the Infectious Diseases & Outbreaks Division with experience working across diverse areas of health promotion, disease surveillance, and outbreak response. She currently serves as a Flexible/Vector-Borne Epidemiologist at the Alabama Department of Public Health (ADPH), where she serves as the ELC-funded workforce development team leader, manages vector-borne disease surveillance, outbreak investigations, and some One Health activities.

Hynes completed her Applied Epidemiology Fellowship through the Council of State and Territorial Epidemiologists (CSTE), where she focused on arboviral surveillance, harmful algal bloom monitoring, Shiga toxin-producing *E. coli* (STEC), and conducting a comprehensive surveillance system evaluation of ADPH outbreak surveillance systems. Her leadership has been instrumental in advancing Alabama's One Health initiatives, including co-leading the establishment of the Alabama One Health Work Group to foster collaboration across human, animal, and environmental health sectors.

Throughout her career, Hynes has overseen more than 90 outbreak investigations, organized, and facilitated monthly statewide internal calls with approximately 50 staff members, authored narratives for Project A and Project K Epidemiology and Laboratory Capacity (ELC) cooperative agreement applications, and developed public-facing educational resources to support disease prevention. She has presented at national, regional, and state conferences, including CSTE, InFORM, and the Alabama Vector Management Society. Her work highlights the critical intersections of environmental and infectious disease epidemiology, community awareness, and cross-sectoral collaboration.

Hynes holds a Master of Public Health in Epidemiology from Jackson State University and a Bachelor of Science in Public Health from the University of Southern Mississippi. She remains dedicated to bridging human, animal, and environmental health disciplines through the One Health approach.



One Health Symposium Speaker

Stephen Olufemi Sodeke, MS, PhD; MA, DBE

Resident Bioethicist, Professor of Bioethics & Allied Health Sciences,
Center for Biomedical Research, College of Arts and Sciences, Tuskegee University



Dr. Stephen Olufemi Sodeke is a Resident Bioethicist at the Center for Biomedical Research, and Professor of Bioethics and Allied Health Sciences in the College of Arts and Sciences at Tuskegee University. Over the years, he has served as Associate Director and Interim Director of the Tuskegee University Bioethics Center. He chairs the Tuskegee University Institutional Review Board, serves as bioethics consultant for the Tuskegee History Center, serves on the Alabama Rare Disease Council, and on the NIH *All of Us Research Program* as co-chair of the Resource Access Board. His research interests are community bioethics, research ethics, health care ethics, gene-ethics, neuro-ethics, health and human rights; community engagement and empowerment; ethical issues in clinical trials, health

disparity, and research with vulnerable populations worldwide.

"The Significance of Ethics in Health Programs: A Bioethicist Perspective"

The presentation will examine the significance of ethics in health programs through a bioethicist's lens, emphasizing why ethical principles must remain central to health education, practice, and policy. By exploring foundational frameworks of justice, autonomy, beneficence, and accountability, it highlights how integrative bioethics provides a holistic approach to addressing complex challenges in diverse health contexts and programs. The talk illustrates how ethical analysis fosters trust, guides decision-making, and strengthens the credibility of health professions while ensuring cultural sensitivity and equity. Ultimately, participants will gain a deeper appreciation of ethics as an indispensable compass for building effective, responsible, and compassionate health programs.



One Health Symposium Keynote Speaker

Lloyd Webb, DVM, MPH

Professor of Public Health and Commissioning Director of the Graduate Public Health Program, Department of Graduate Public Health, College of Veterinary Medicine, Tuskegee University



Dr. Lloyd A.W. Webb is a 1978 graduate of the College of Veterinary Medicine (CVM), Tuskegee University, Tuskegee, Alabama. He served as the commissioning Director of the Graduate Public Health Program from 2011 until July 2016. He was also the Interim Associate Dean for Student Affairs at Tuskegee University and has made significant contributions using his vast knowledge and experience in the field of clinical veterinary medicine and public health. He has taught several courses to public health and veterinary medical students at Tuskegee University, and at the University of the West Indies in his native country, Trinidad and Tobago. Webb has performed duties in administration, research, and community service with emphasis on the Black Belt Counties (BBCs) of Alabama. His depth of knowledge in epidemiology, advanced epidemiology, risk analysis with emphasis on risk communication and risk management, food safety and quality, and zoonotic

infectious diseases has enabled him to understand the multi-disciplinary approach and its importance to the animal, human, and environment triad that embraces the One Health concept.

He has vast experience at the local, regional, state, and international levels and believes that community engagement is a key factor when addressing public health issues through biomedical research and public health linkages. His philosophy is to engage public health graduate students as the future change agents in community outreach activities, seeking out research and community development opportunities for sustainability. Webb transitioned to Tuskegee University after serving ten years as the Caribbean Regional Advisor on Veterinary Public Health within the Pan American Health Organization/World Health Organization (PAHO/WHO). His professional career spans years of public health experience that has led to engagement and advisement for Government Ministers, Permanent Secretaries, Chief Medical Officers, Chief Veterinary Officers and Directors of Animal Production Departments/Units.



One Health Symposium

High School Students Orientation Moderators



Brandon R. Isome, PhD

Director of Bioethics Honors Program and Assistant to the Director, The National Center of Bioethics in Research and Health Care, Tuskegee University

Dr. Brandon R. Isome is an insightful educator, administrator, and methodologist known for his ability to weave biblical scholarship, educational law and policy, Hip Hop, and Black culture into practical language. Isome's research interests encompass Black underground families, Black popular culture, Black antebellum culture, and Black education. Some transferred into the Doctor of Philosophy (PhD) program at the University of Georgia, where he received a Graduate Teaching Assistantship.

On March 18, 2024, Isome successfully defended his dissertation entitled, "I Do It For My Hood": Deconstructing Disparaging Narratives on Black Family Engagement by Interweaving Autoethnographic Reflections of Black Underground Families with Godfather of Harlem, Seasons 1-2. Isome graduated from the University of Georgia in May 2024 with a PhD in Critical Theory and Practice, specializing in Qualitative Methodologies, Educational Law and Policy, and Diversity, Equity, and Inclusion.



Jacob Grant

Second Year DVM Student, College of Veterinary Medicine, Tuskegee University

"From the moment I could pronounce *veterinarian*, I knew that's what I wanted to become". Growing up in a household filled with the sounds of barking dogs, crowing roosters, and chattering parrots, he was surrounded by animal lovers who dedicated their lives to caring for animals. This environment shaped him from a young age and gave him the privilege of interacting with and caring for animals as a normal part of daily life. Becoming a veterinarian was never just a dream—it was the obvious path, and he never wavered from it.

Grant grew older, his passion has deepened, particularly in the area of turtle and tortoise care. He now cares for several species, and this responsibility has driven him to continually educate himself about their specific needs. Learning about issues such as the declining wild populations of sulcata tortoises—despite their growing numbers in captivity—sparked a strong interest in conservation. This awareness further confirmed that his life's work must be dedicated not only to caring for animals but also to preserving their existence in the wild.

Grant says that balancing school and animal care responsibilities has been challenging, but his determination never falters. He has spent weekends and school breaks working at an animal clinic in his hometown in Georgia, gaining hands-on experience that has shaped his understanding of veterinary medicine.

One Health Symposium

High School Students Orientation Speaker

Astril Webb-Harewood, MD

President, Healthy Kinder International, LLC



Dr. Astril Webb-Harewood is the President of Healthy Kinder International, LLC, an organization whose core mission is to promote healthy lifestyles for families. She is a Senior Healthcare Professional, Global Trainer & Public Speaker with over two decades of senior level experience in the healthcare industry. She is a graduate of Howard University where she attended both Undergraduate and Medical School. Over her professional lifetime her work has been primarily focused on Prevention and Wellness Initiatives targeting community and corporate wellness, leadership coaching, strategic consulting and mentorship.

Through her leadership she has developed and implemented several effective cultural competency health promotion and prevention training programs around chronic disease self-management and mental

health awareness for various communities, government and non-government entities. Dr. Webb-Harewood has served on numerous Advisory and Task Force Committees representing the medical needs of health disparate communities. As the Former Director of The National Center for Health in Public Housing and The National Center for Health and The Aging, two partially funded National Cooperative Agreements by the U.S. Department of Health and Human Services Agency Health Resources and Services Administrations' (HRSA), she supported over 3,000 federally qualified health centers and clinic across the United States. Amongst her many accolades, in 2014 she received a Community Leadership Award from President Obama's Council on Fitness, Sports & Nutrition for exemplary service and dedication while making a significant impact in public health, and in 2020, she was awarded the Global Female Icon Award by Future Focus Empowerment Institute International, a nonprofit organization supporting a network of Youth Ambassadors representing over two hundred nations.

One Health Symposium

High School Students Orientation Speaker

Avia Sutton, MPH, MS, GC,

Genetic Counselor, UT Health Austin Pediatric Neurosciences, Dell Children's Medical Center and UT Health Austin



Avia Sutton is a genetic counselor in the UT Health Austin Pediatric Neurosciences at Dell Children's, a clinical partnership between Dell Children's Medical Center and UT Health Austin. Sutton earned her bachelor's degree in behavioral neuroscience from Nova Southeastern University in Florida, her master's degree in public health from Tuskegee University, and her master's degree in genetic counseling from the University of North Carolina Greensboro. She completed an internship at the Research Triangle Institute (RTI), the North Carolina Leadership Education in Neurodevelopmental and Related Disabilities (LEND) fellowship at the Carolina Institute for Developmental Disabilities, a multispecialty rotation at Cone Health, and additional training in adult and pediatric neurology at the University of North Carolina Chapel Hill. Sutton's previous experience includes a cancer genetic counseling rotation at Orlando Health Cancer Center, a prenatal genetic counseling rotation at Atrium Health Wake

Forest Baptist Hospital, and a pediatric genetic counseling rotation in pediatric genetics and metabolism at the University of North Carolina. Her clinical interests focus on pediatric neurology and prenatal counseling and her research interests include neurodevelopmental disabilities, public health genetics and education, and patient advocacy.



One Health Symposium Community Session

Panel Discussion Moderator



Kim R. Ortiz, Ed.S., M.A., M.P.A. '92 serves as the Director of Alumni Engagement with the Tuskegee University Division of Development and Alumni Engagement for the College of Veterinary Medicine. She also serves as the Coordinator of Strategic Planning and Development for the College. Ortiz genuinely enjoys *Connecting, Reconnecting, and Staying Connected* with the College of Veterinary Medicine's Alumni. In her dual roles, she co-chaired the 59th Annual Veterinary Medical Symposium (2025) and is co-chairing the 60th Annual Symposium (2026).

A multi-sector servant leader, Ortiz brings over three decades of coast-to-coast experience in private sector budgeting, corporate sales and customer service; public sector operations, community engagement, and grants management; P-12 school counseling and professional development; higher education continuing education and student affairs; and conference and event planning. Immediately prior to joining the University, Ortiz was the Coordinator for Community Development/Grants for the City of Tuskegee, Alabama, and the Project Director for the City's three-year, \$3 Million United States Department of Health and Human Services Office of Minority Health-awarded *Advancing Health Literacy Grant*, with community-facing outreach to eight towns in five counties in the Alabama Black Belt. The *AHL Grant* was in partnership with Tuskegee University.

The Mobile, Alabama, native is a *Cum Laude* graduate of Tuskegee University with a Bachelor of Science degree in Finance with a minor in Economics. She earned a Master of Arts degree in Counseling and Human Development, with a concentration in School Counseling, from Clark Atlanta University (Atlanta, Georgia); a Master of Public Administration degree, with a concentration in Public Human Resource Management, from Troy University (Troy, Alabama); and a post-graduate Educational Specialist degree in Counseling from Old Dominion University (Norfolk, Virginia.)

Professionally and academically, Ortiz is a member of the Honor Society of Phi Kappa Phi; Alpha Kappa Mu National Honor Society; Golden Key International Honour Society; Who's Who Among Students in American Colleges and Universities; Delta Mu Delta International Honour Society in Business; Chi Sigma Iota Counseling Academic and Professional Honor Society International; and Pi Alpha Alpha, The Global Honor Society for Public Affairs and Administration. A lifelong learner, she is a graduate of the General Electric Capital Mortgage Corporation Leadership Development Program (Raleigh, North Carolina); Tuskegee University Continuing Education Program Leadership Macon County-Class II; Yale University Child Study Center School Development Program (New Haven, Connecticut); Alabama City/County Management Association Local Government Professional Management Certificate Program; Alabama Economic Development Association Leadership Institute; and the Auburn University Government and Economic Development Institute Intensive Economic Development Training Course-Parts I and II. Ortiz is honored to be a recipient of the *Annie Singleton Award* from Alpha Phi Alpha Fraternity, Incorporated, Gamma Phi Chapter at Tuskegee University. She also received the *Excellence in Service to Students Award* by the Tuskegee University Chapter of Sigma Alpha Pi, The National Society of Leadership and Success.

Kim R. Ortiz is a tremendously proud Life Member of Alpha Kappa Alpha Sorority, Incorporated. Initiated into the Gamma Kappa Chapter at Tuskegee University, she was honored with the Chapter's 65th Anniversary *Spirit of Excellence Award*. Locally, she served as Vice-President, chaired several committees, and received the *Community Service Award*. Regionally, she was honored for her Graduate Advisor service at Tuskegee University.

For leisure, Kim totally enjoys amusement parks, live music and theatre, film festivals, documentaries, reading, museuming, and the art of *couture*. An avid adventurer at heart, her absolute favorite delights are traveling, exploring, and appreciating cuisines and sweets, especially chocolates.

One Health Symposium Community Session

Panel Discussion Speaker

David Augustin Hodge, Sr., PhD, D.Min., M.Ed, M.T.S.

Director (Interim), Lead Ethicist, Research Professor, The National Center of Bioethics
in Research and Health Care, Tuskegee University



Dr. David Augustin Hodge, Sr. is the Interim Director, Lead Ethicist, and Research Professor at the National Center for Bioethics in Research and Health Care at Tuskegee University. He also serves as Editor-in-Chief of the *Journal of Healthcare, Science, and the Humanities*, a PubMed-indexed journal dedicated to interdisciplinary scholarship in health, ethics, and the humanities.

A theologian, philosopher, and ethicist, Hodge's research engages Black bioethics, public health ethics, empathy, care ethics, and virtue ethics, with special attention to the role of trust and trustworthiness in healthcare and research. His forthcoming books include *Black Bioethics and Intersectionality: Public Health, Empathy and Care* (Springer Press) and a textbook on *Black Bioethics and Intersectionality* (Cognella Press). His previous publications include *God of Our Silent Tears: Women of the Bible Healing Women of Today*; *God of Our Silent*

Tears: A Five Week Journey; and *In the Midst of My Tears: The Bible Speaks to Abandonment, Betrayal, Rejection and Loss*.

Hodge holds a B.A. in Bible, Theology, and English from American Baptist College; an M.A. in Education from Oral Roberts University; an M.T.S. in Theology and Ethics from Emory University's Candler School of Theology; a Doctor of Ministry in Gospel and Culture from Columbia Theological Seminary; and a PhD in Philosophy (majoring in philosophical ethics) from the University of Miami.

He previously served as Chair of the Religion and Philosophy Department at Florida Memorial University, adjunct professor of philosophy at Georgia State University, and guest lecturer at the Interdenominational Theological Center in Atlanta. He is also noted as being a Visiting Faculty-in-Residence, Center for Bioethics, Harvard Medical School. A native of St. Thomas, U.S. Virgin Islands, Hodge is married to Theresa Paula Hodge, an elementary school educator, and together they have three children.

One Health Symposium Community Session

Panel Discussion Speaker

Angel Walker, BS, MS, PhD

Executive Director of Macon-Russell Community Action Agency, Inc.,
CEO/owner Strategic Training and Resource Solutions (STARS)



Dr. Angel Walker is the Executive Director of Macon-Russell Community Action Agency, Inc. in Alabama. She is the CEO/owner of Strategic Training and Resource Solutions (STARS), a training and consulting company. Walker has earned Bachelor's Degrees in both Human Services and Industrial/Organizational Psychology. She also has a Master's Degree in Business Administration and PHD in Strategic Leadership and Organizational Management. Walker is a Nationally Certified Master ROMA (Results Oriented Management and Accountability) trainer, (CCAP) Certified Community Action Professional, Certified Bridges Out of Poverty trainer, Certified Life Skills trainer, Certified Trauma Informed Care trainer, Family Centered Coaching trainer, Environmental Justice Train the Trainer, Certified Project Management Professional and a trainer and consultant in various other management and leadership areas. She is the President of the Tuskegee Area Chamber of Commerce, the Vice President for the Community Action Association of

Alabama, 3rd Vice President for the National Community Action Partnership, the Secretary of the United Way Emergency Food and Shelter Board in Russell County, Alabama, and the Treasurer for the Troy University Riverfront Toastmasters. Walker also sits on several boards and committees in the State of Alabama, regionally, and nationally. She is a proud member of Zeta Phi Beta Sorority Incorporated, Alpha Xi Zeta Chapter, where she is the 2nd Vice President.



One Health Symposium Community Session

Panel Discussion Speaker

Lucenia W. Dunn, PhD

President and CEO, Tuskegee-Macon County Foundation, Inc.



The hallmark of the career of Dr. Lucenia W. Dunn has been innovations to improve the lives of people. Born in rural Georgia on her grandparent's farm and growing up in historic Tuskegee Institute, Alabama, she learned early that giving back to help improve the lives and conditions of others was not just a cliché, but an important commitment in one's life. Improving lives by fighting for economic growth, educational equity, and social justice, not just by demonstrating in the streets, but as an administrator and decision maker who engages in organizational development that serves the needs of others. Dunn is a visionary who is looking constantly for solutions to the many challenges facing people of color and others living in poverty in rural and urban communities.

Currently, she is the Founder and President/CEO of the Tuskegee Macon County Community Foundation, Inc. (TMCCF). It is a 501 (c) (3) public charity organization that manages philanthropic dollars, addresses community challenges, and develops public/private partnerships. The primary focus of TMCCF is the reduction of health and economic disparities and the development of equity strategies for rural communities. This includes

improving healthcare delivery systems and initiating economic eco-systems by creating models using technology.

Dunn has a passion for history and has been integrally involved in saving and promoting African American History and Culture. Appointed by the Governor of the State of Maryland, and elected Vice Chair, she served on the Commission for the Study of African American History and Culture. She is a Founding Director of the Reginald Lewis African American History Museum, Baltimore, MD, and served on the Board of Directors of the Banneker Douglass Museum of African American History, Annapolis, MD. In addition, Dunn served as a creative advisor to the national and internationally acclaimed photographic essay, *Songs of My People*. She served two four-year terms on the Executive Council of the Association for the Study of African American Life and History (ASALH), a national organization founded by Carter G. Woodson in 1915.

Dunn has the honor of being the first woman elected Mayor of the City of Tuskegee with 63% of the highest voter turnout in the city's history. While there were many accomplishments as Mayor, she is most proud of circumventing the closure of the Head Start Program by the Federal Government, thereby retaining a \$2.4 million dollar program and approximately 72 jobs for rural women. She negotiated the retention of and helped to design the Tuskegee Airmen Museum at Moton Field. Furthermore, at the request of the Alabama Governor, Dunn planned and coordinated the development of the Macon County proposal and \$100,000 financial participation that helped to successfully recruit the Hyundai Automobile Plant in Hope Hull, Alabama. This enabled the City of Tuskegee and Macon County to be a first-tier business site. The automobile plant located in Shorter, Alabama is the direct result of this initiative. Perhaps as important, while mayor, Dunn initiated the re-structuring of the finances by introducing Zero Based Budgeting to City government and the Utilities Board so that the city never missed a payroll and the staff could count on being paid on time. Finally, she completed the renovation of 12 houses around the City Lake, its infrastructure and paved the streets.

Dunn is a proud graduate of two HBCUs - Fisk University in Nashville and Tuskegee University in Tuskegee. She earned her PhD from the University of Pittsburgh, Pittsburgh, PA. She is the proud mother of one daughter. Dunn is a member of Delta Sigma Theta Sorority Inc., The Links, Incorporated, life member of the National Council of Negro Women, a member of the National Association for the Advancement of Colored People and the Class of 1961 Tuskegee Institute High School Alumni.

One Health Symposium Poster Presenters

Animal Health

Genomic Characterization of H₂S-negative *Salmonella* Typhimurium 4:i:1,2 Isolate from Calf Feces

Kingsley Bentum¹, Emmanuel Kuufire¹, Rejoice Nyarku¹, Viona Osei¹, Samuel Temesgen¹, Woubit Abebe¹

¹College of Veterinary Medicine, Center for Food Animal Health, Food Safety, and Food Defense, Tuskegee University, Alabama, USA.

The circulation of hydrogen sulfide (H₂S) negative *Salmonella* serovars continues to be a public health threat. This study analyzed the whole genome sequence of an H₂S-negative *Salmonella* for mutations in the *phs* operon, notable for H₂S production and for the presence of plasmids and antimicrobial-resistant genes. Briefly, 311 fecal samples were collected in the Spring of 2024 from rural cow-calf farms in Alabama and screened for *Salmonella*. Results showed that one isolate recovered from a calf exhibited an H₂S-negative phenotype. This isolate was sequenced, and the genome was analyzed for the sequence type, presence of plasmids, and antimicrobial resistance using PubMLST, Plasmidfinder, and the Comprehensive Antimicrobial Resistance Database (CARD). Bettercallsal was used to identify the closest neighbor to this isolate. Genetic analysis revealed that the isolate was a *Salmonella* Typhimurium i-4-1,2 of the sequence type ST19. Also, except for a missense mutation of A>C on the *phsC* gene and a synonymous mutation of C>T on the *cysI* gene, no other mutations were detected on the other genes of the operons *phs*, *cys*, and *asr* reported to be involved in H₂S production by *Salmonella*. The closest neighbor to the isolate was also clustered with the Poulvac poultry vaccine. The isolate also carried notable multi-drug efflux genes *mdtBC*, *mdsABC*, *mdtK*, and *marA*, and the plasmids: IncFIB(S), IncFII(S), and IncFII(pAR0022). Mutations in the *phs*, *asr*, and *cys* operons may not necessarily be consequential in producing H₂S-negative *Salmonella* isolates. This result also reiterates the need to look out for these isolates in routine isolation protocols.

Research Support: This research was funded by grants from USDA/NIFA CBG 2021-38821-34710 and USDA/NIFA/AFRI 2022-67017-36982.

Fighting Contagious Bovine Pleuroneumonia: Reviewing and Expanding on Strategies to Combat Contagious Bovine Pleuroneumonia

Allisen Morris, Lillie Miller, Brendon Mason 1

Department of Animal Science, North Carolina Agricultural and Technical State University, Greensboro, NC,

2College of Agriculture, Environment, and Nutrition Sciences, Tuskegee University, Tuskegee, Alabama,

3Department of Agriculture and Animal Science, Prairie View Agricultural and Mechanical University, Department of Agricultural and Environmental Sciences.

Contagious Bovine Pleuropneumonia (CBPP) remains a significant threat to cattle health and farmer livelihoods in sub-Saharan Africa, where it is an endemic, and current vaccines offer limited protection. In our study, we investigated whether combining CBPP vaccination with antibiotic treatment would reduce disease incidence and severity more effectively than vaccination alone. Using data from field trials, we evaluated the effects of antibiotics, tulathromycin, gamithromycin, and oxytetracycline, administered alongside the commonly used T1/44 and T1sr vaccines. Observably, sentinel cattle exposed to treated animals showed no signs of infection, with protection rates reaching up to 98%. In addition, we used the SVEIQR disease model to simulate outcomes at the herd level, finding that combining antibiotics with vaccination could reduce infection prevalence from nearly 80% to 0%. Our findings suggested that antibiotic treatment strengthens vaccine effectiveness and could be a valuable strategy in controlling or eliminating CBPP. We recommend further research to examine long-term effects, antibiotic resistance risks, and feasibility in rural livestock communities.

Research Support: United States Department of Agriculture(USDA), National Bio and Agro Defense Facility(NBAF), NBAF Laboratory Training Program(NLTP), Tuskegee University Department of Agriculture Student Support: Saidu, S. E. A., Mburu, D. N., & Gari, G. (2024). CBPP vaccination and treatment strategies: Simulation-based insights into disease control. *Frontiers in Veterinary Science*, 11, 12158587. PubMed World Organisation for Animal Health. (n.d.). Contagious bovine pleuropneumonia. Muuka, G., Otina, B., Wesong, H., Bowa, B., Gircheru, N., Stuke, K., Poole, J., Salt, J., & ColstonPubMed, A. (2019). Evaluation of new generation

macrolides for the treatment and metaphylaxis of contagious bovine pleuropneumonia (CBPP) in cattle experimentally infected with *Mycoplasma mycoides* subspecies *mycoides*. PubMed, Dr. Olga Bolden-Tiller, Dr. Osagie Idehen, Dr. Marceline Egnin, Ms. Shermaine Critchlow.

One Health Symposium Poster Presenters

Environmental Health

Mapping Sediment Variability on an Artificial Reef Using Multi-beam Sonar Backscatter Data

De'Shell Carr, Anand Hiroji

College of Arts and Science, Tuskegee University, College of Marine Science, The University of Southern Mississippi

Multi-beam sonar systems are commonly used for seafloor mapping, providing both high-resolution bathymetric data and measurements of acoustic backscatter intensity, which reflect the properties of the seafloor. These intensities depend on both, the type of seafloor material and the angle and frequency of the sound waves used. In this project, multi-beam sonar data collected in 2024 over a newly built artificial oyster reef along the Mississippi coast was processed using QPS FMGT software. The sonar operated in multifrequency mode, alternating between 170, 300, and 400 kHz. For each frequency, backscatter mosaics were generated and assigned unique color gradients: red (170 kHz), green (300 kHz), and blue (450 kHz). These mosaics were then combined to produce a single multifrequency composite image of the seafloor. This presentation explains how the mosaics were created and highlights how seafloor characteristics vary across the survey area, offering insight into both spatial patterns and acoustic response to the reef environment.

Bats in an Urban Forest: A Presence and Deterrence Study

Sha'Kiya N. Madison, Rashidah Farid-Tilghman

Urban Forest, Tuskegee University, Russell Experimental Forest Mississippi Wildlife

Considering to the Island Biogeography Theory, isolated populations with little matrix connectivity led to decrease in biodiversity and an increased risk of extinction. However, Tuskegee University's campus, an urban forest, has generated an ideal habitat by creating artificial roosting sites with a robust matrix of connectivity of urban forest in between. Thus, it has become a problem in many urban places like campuses to manage bat populations. In this study, we will explore methods of deterrence to minimize the occupation of bats in urban environments. The sole purpose of the research is to assess the behavioral response of the bat population to the various variables of deterrence and investigate its effectiveness without disrupting the normal ecological processes of the species. It is hypothesized that the presence of bats in an urban forest can be reduced by the introduction of bat houses and variables of deterrence such as artificial light and scent. This study aims to (1) to quantify the population of bats using motion sensor camera traps, (2) provide idea roost habitats (bat houses), and (3) deter the present population off campus into nearby forest using variables such as bat attractant, artificial solar lights, and predatory scent (wolf urine and moth balls). This preliminary experiment will provide non-invasive management strategies bat populations on Tuskegee University's Campus. Possible outside factors of the urban forest and/or environment may affect the experimental system and alter my results. Tuskegee University, Macon County, and the present bat population will benefit greatly from this experiment.

Keywords: Island Biogeography Theory, matrix, urban forest, camera-traps, artificialroost, deterrence, attractant

References: Collinge, Sharon K. "Effects of Grassland Fragmentation on Insect Species Loss, Colonization, and Movement Patterns." *Ecology*, vol. 81, no. 8, Aug. 2000, p. 2211, <https://doi.org/10.2307/177109>. Lerman, Susannah B, et al. "Wildlife in the City: Human Drivers and Human Consequences." In: Barbosa, Pedro, Ed. *Urban Ecology: ItS Nature and Challenges*. Boston, MA: CABI Publishing: 37-66., 2021, pp. 37-66, research.fs.usda.gov/treesearch/61761.

Research Support: USDS Southern Research Station Agreement: Tuskegee University - Russell Experimental Forest Mississippi Wildlife, NGO; **Student Support:** USDS Southern Research Station Agreement: Tuskegee University - Russell Experimental Forest Mississippi Wildlife, NGO

The Spatial and Seasonal distribution of Air-Sea CO₂ Flux in Narragansett Bay, RI

Kaila Pruitt, Hongjie Wang
University of Rhode Island, Graduate School of Oceanography

The ocean plays a vital role in the global carbon cycle, absorbing approximately 25–33% of anthropogenic CO₂ emissions. However, considerable uncertainties remain about the magnitude and variability of CO₂ exchange in coastal systems, which—despite accounting for only ~7% of the ocean's surface—are highly dynamic due to land-sea interactions, nutrient loading, and seasonal biological activity. This study, titled "The Spatial and Seasonal Distribution of Air-Sea CO₂ Flux in Narragansett Bay, RI," investigates the temporal and geographic variability of CO₂ fluxes within a temperate estuary to determine whether Narragansett Bay functions as a net CO₂ sink or source. Using high-frequency temperature, salinity, pH, along with climatology wind speed data, from 10 sites in the Narragansett Bay Fixed Site Monitoring Network (NBFSMN), spanning from 2005 to 2020, we estimated air-sea CO₂ fluxes across different regions of the Bay. Our analysis highlights the strong monthly seasonal trends in CO₂ flux behavior typically shown where carbon uptake dominates during the winter month (cold water takes up atmospheric CO₂) and CO₂ release increases during the warmer summer months due to ongoing respiration. Annually, Narragansett Bay is a net CO₂ source with a magnitude of 0.1~0.2 Metric ton per year, comparable the CO₂ emissions observed in as the total RI waste related greenhouse gas emission, but higher than the agriculture related greenhouse emission. The implication of this work extends to improving regional greenhouse gas inventories, such as Rhode Island's state report, which currently omits marine CO₂ exchange from Narragansett Bay. By addressing this critical data gap, the project supports more accurate carbon budgeting, enhances climate policy effectiveness, and provides a foundation for assessing the impact of future CO₂ mitigation strategies in coastal environments.

Prions in the Environment: The Science and Spread of Chronic Waste Disease

K. Peprah¹, **M. Renfro**², O. Idehen², S. Critchlow², O. Bolden-Tiller², W. Simmons², C. Jones², A. Worthy²

¹Dept. Of Agriculture, Food and Resources Sciences, University of Maryland Eastern Shore, Princess Anne MD,

²Dept. of Agriculture and Environmental Sciences, Tuskegee University, Tuskegee, AL

Chronic Wasting Disease (CWD) is a fatal, transmissible spongiform encephalopathy affecting cervids such as deer, elk, and moose. This project investigated the relationship between cervid population density and CWD infection rates across several key U.S. regions, including Wisconsin, Colorado, and Montana. A combination of field and laboratory methods—such as ELISA testing, camera trapping, aerial surveys, pellet counts, and GIS spatial analysis—we quantified disease prevalence in high- and low-density populations. Results indicated a strong positive correlation between population density and infection rates, particularly in areas with limited management interventions. These findings support the hypothesis that denser populations increase the risks for prion contamination and increased animal-to-animal transmission. By integrating ecological data with diagnostic testing, this study provided insight into how population dynamics influence disease spread and offers recommendations for improved surveillance, targeted culling strategies, and habitat management to mitigate the impact of CWD on North American Cervid populations.

Research Support: USDA (United States Department of Agriculture); NBAF (National Bio and Agro-defense Facility); Tuskegee University College of Agriculture, Environmental and Nutritional Science Tuskegee University College of Veterinary Medicine; NBAF Laboratory Training Program (NLTP)

Coastal Connections

Willow Rhimyr, Alex Deccicio

Tuskegee University, University of Rhode Island

This project explores Rhode Island's coastal ecology through a series of paintings. I created eight watercolor paintings as representations of the coast, inspired by books in the Pell Marine Science Library, visits to the shore, and scientific papers. In eastern Rhode Island, Narragansett Bay is a ~ 14000 year old brackish inlet named after one of the tribes who have been living there. It has experienced dramatic changes in the past few hundred years, especially with pollution. Today it has a variety of sandy beaches, rocky edges, and salt marshes. Salt marshes are coastline prairies, sponges for toxins and nutrients, and home for fiddler crabs and periwinkle snails. Seaweeds wash up along their edges, as seaweed washes up regularly on the coast. An array of colors and textures can be found in every smelly mat. Single celled algae such as diatoms are equally proliferate in the Bay. Diatom's cell walls are made of silica (glass), and they are almost ubiquitous to water sources. The salt marsh regulates silica, which in turn regulates diatoms. Ecology is like the changing gradient of the coast, fluctuations and relationships between life and place and time.

How Long till I Croak? Age and Growth Dynamics of Atlantic Croaker (*Micropogonias undulatus*) in Mississippi Waters

Karrington Taylor¹, Gary J. Gray², Jeremy M. Higgs², Jill M. Hendon², Daryl C. Parkyn²

¹College of Agriculture, Environmental, and Nutritional Sciences, Tuskegee University; ²Center for Fisheries Research and Development, The University of Southern Mississippi

Atlantic Croaker (*Micropogonias undulatus*) is an important commercial species distributed from Massachusetts to Campeche Bay, Mexico occupying estuaries and sandy/muddy coastal habitats. Atlantic Croaker life history information is sparse; however, historically they grew to larger sizes than what is found today. This study examined age and growth dynamics of Atlantic Croaker in the Mississippi Sound estuary using 560 specimens collected from 2005 to 2015 (females: n = 365, total length = 160.0 - 320.0 mm; males: n = 81, total length 165.0 - 266.0 mm). The sex ratio was strongly female-biased (1:4.4). Otoliths were extracted and embedded in epoxy resin. Two transverse cuts were made through the otolith nucleus to obtain a 400 µm cross section. Annuli were enumerated, and margins of growth increments were scored by two independent readers (APE = 0%). Observed length at age data were fitted to three growth models: 3-parameter von Bertalanffy, Gompertz, and logistic non-linear model. The three models had poor fit and performed identically by sex (Male $R^2 = 0.120$; Female $R^2 = 0.127$). Females were generally larger than males, but size had a weak correlation with age. The maximum observed age was 9.25 years, which was higher than in previous literature. Future research should include a broader age range through more extensive sampling. The data presented herein contributes to the wider knowledge of Atlantic Croaker age and growth, as well as providing important life history information for future conservation efforts and estuary management.

Research Support: Mississippi Department of Marine Resources, USM, Center for Fisheries Research and Development; **Student Support:** NOAA OECI

Comparative Assessment of Physicochemical and Microbiological Water Quality Across Treated and Untreated Water Sources in Tuskegee, Alabama

Jacqueline Wallace¹, J. Idehen, O.¹, Alston, V.^{1,2}, and Fagbodun, S.²

¹College of Agriculture, Environment and Nutrition Sciences, Tuskegee University, Tuskegee, AL, ²College of Arts and Science, Tuskegee University, Tuskegee, AL

Water quality is a fundamental aspect of environmental health and public safety, particularly in rural and semi-rural areas where alternative water sources are often used for drinking, irrigation, or aquaculture. However, these water sources are prone to contaminations due to natural occurrences (flood, geological events, etc.) and anthropogenic activities (industrial activities, mining, agricultural activities, etc.) In Tuskegee, Alabama, diverse water bodies—including natural ponds and a recreational lake—serve different functions but are often poorly monitored. This study assessed both physicochemical and microbiological water quality parameters across multiple treated and untreated

water sources in Tuskegee, Alabama. These include the Tuskegee-Ford City Lake, Tuskegee University's Equine Pond, Campus tap water, and municipal tap water sources. The samples were tested for Bicarbonate Alkalinity (as CaCO₃), Ammonia Nitrogen, Phosphorus, Nitrate, Calcium Hardness, Magnesium Hardness, Total Hardness, Free Carbon Dioxide, Chloride, Copper, Cyanide, pH, and coliform bacteria. Results were compared across sampling sites and evaluated against established drinking water standards to assess contamination levels and potential health risk. The overall health of City Lake exhibited higher levels of pollution than the Equine Pond, likely due to greater human activity. Concerning levels of contamination in Tuskegee's water bodies, particularly the presence of coliform bacteria in outdoor locations and elevated pollutants linked to human activity in City Lake, underscoring the need for improved monitoring and management. Results emphasize the importance of regular water quality assessments to safeguard public health, especially in rural and semi-rural areas where water sources are vital for multiple uses.

Evaluating the Antimicrobial Efficacy and Associated Properties of Selected Essential Oils: Hemp, Basil, & Lemongrass in Polymers

Shannon Willis, Desmond Mortley

Department of Agriculture and Environmental Sciences, Tuskegee University

Essential oils (EOs) offer versatile applications in medical, pharmaceutical, food preservation, and agricultural fields due to their antimicrobial properties. With growing concerns over antibiotic resistance, environmental sustainability, and food safety, EOs have emerged as natural alternatives to synthetic antimicrobials. Lemongrass EO, rich in citral, demonstrates rapid antimicrobial action, basil EO provides sustained effects through eugenol and linalool, and hemp EO shows dose-dependent efficacy linked to cannabidiol (CBD) content. This study evaluates the antimicrobial efficacy of industrial hemp (*Cannabis sativa*), lemongrass (*Cymbopogon citratus*), and basil (*Ocimum basilicum*) essential oils against *Escherichia coli* (E. Coli) in PHBV polymer systems as a biodegradable plastic. The research investigates how EO concentration, polymer compatibility, and release mechanisms influence bacterial inhibition, as well as evaluating the physical properties of these EOs and polymers which impact their antimicrobial effectiveness. Hemp EO's will be extracted through methods such as steam distillation and ethanol extraction, while maintaining antimicrobial properties. The hemp EO includes 6 different varieties such as; Cherry Blossom, Cherry Blonde, Hot blonde, Cinderella Story, Cloud Berry, & Cherry Blossom. The study will be conducted as a completely randomized design with three EO's, at five concentrations of 0.25, 0.5, 1.0, 2.0 and 4.0 % (v/v), and five replications. So far from the steam distillation extraction method out of the six varieties of hemp it was found that three varieties show an average oil yield of less than two percent while the ethanol extraction method averaged closer to two percent or more. Further research is being conducted for characterization analysis with over 16 samples from both extraction methods to help determine the antimicrobial compounds such as cannabinoids and terpenes through the Agilent 8890 GC System at Auburn University. The findings will contribute to the development of eco-friendly antimicrobial agents, supporting sustainable solutions for food packaging and biomedical applications, by focusing on; EO extraction methods, yield, polymer interactions, concentration levels, and antimicrobial activity.

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One Health Symposium Poster Presenters

Human Health

Exploring the Role of Endothelial Cells in Anti-Tumor Immunity

Christopher D. Howard¹, Swetha Anandh², Caroline Riedstra², Jingwen Huz², Andrew C. Dudley^{2,3}

¹Tuskegee University, Tuskegee, AL; ²University of Virginia Department of Microbiology, Immunology, and Cancer Biology, Charlottesville, VA; ³UVA Comprehensive Cancer Center, Charlottesville, VA

Endothelial cells (ECs) play a key role in regulating blood flow and guiding immune cells into tissues, but their function during anti-tumor immunity is not fully understood. Using Yumml.7 (low mutational burden) and Yummer1.7 (high mutational burden) melanoma models, we observed that Yummer1.7 tumors had a greater population of interferon-stimulated ECs with upregulated class II MHC and antigen-processing genes. These data suggest that these ECs might be immunomodulatory. To test whether ECs can actively interact with tumor-derived material, we performed an in vitro co-culture assay using mouse dermal ECs pulsed with heat-killed ZsGreen-labeled melanoma cell corpses. Flow cytometry showed that ECs co-cultured with tumor debris became ZsGreen-positive, indicating internalization of tumor material. This uptake was observed in both Yumml.7 and Yummer1.7 co-cultures with ECs. To confirm that the ZsGreen signal **reflected** internalization and not surface binding, we pre-treated ECs with Cytochalasin D, an actin polymerization inhibitor. Cytochalasin D treatment reduced ZsGreen uptake, supporting the hypothesis that ECs actively engulf tumor debris. These results suggest that ECs, beyond their canonical role of providing blood, oxygen, and nutrients, can sample and engulf tumor-derived material. This raises the possibility that ECs may contribute to antigen processing and presentation.

Research Support: Andrew C. Dudley; University of Virginia Department of Microbiology, Immunology, and Cancer Biology, Charlottesville, VA; UVA Comprehensive Cancer Center, Charlottesville, VA Student Support: Swetha Anandh, Caroline Riedstra, Jingwen Huz, Andrew C. Dudley; University of Virginia Department of Microbiology, Immunology, and Cancer Biology, Charlottesville, VA

Dietary Diversity and Undernutrition Status of Under-five children in Sub-Saharan Africa - The Case of Democratic Republic of Congo

Johnpaul Kagulire, Nelson O. Oranye and Asseged B. Dibaba

Department of Public Health, College of Veterinary Medicine, Tuskegee University, Tuskegee, Alabama

Child malnutrition remains a serious global public health concern, particularly in low-income countries where its impact is most pronounced. In Sub-Saharan Africa (SSA), the UNICEF reported a death rate of 68 per 1,000 live births in 2023, making the region with the highest under-five mortality rates globally. This global public health crisis is mostly linked to a state of widespread undernutrition. While lifestyle, medical conditions, and general socioeconomic conditions can influence nutritional status, food consumption is perhaps the most significant indicator of nutritional status for children. In Sub-Saharan Africa, the relationship between diet and nutritional status is modified by various socio-economic factors like household income quintile, mother's education, and societal level factors including food insecurity resulting from conflicts. Most under-five mortality in the SSA are related to undernutrition conditions like stunting, wasting and being underweight. This study used a large national representative data to analyze the association between food groups consumed and minimum dietary diversity with various forms of undernutrition in the Democratic Republic of Congo. An adjusted multiple comparisons of the Least Squares Means was performed using the Tukey-Kramer statistics. There was a significant difference in severe stunting levels between those fed with four or more food groups and those fed with fewer than four food groups, $t = 2.46$, $p = 0.0142$. Food diversity and consumption of minimum food group affects the degree of malnutrition but is modified by socioeconomic factors.

Consumer-Based Assessment Analysis of Local Organic Beef Versus Grain-Finished Beef in the Alabama Black Belt Region

Imani Murphy, Dr. Clarissa Harris

Meat Science Laboratory, College of Agriculture, Environment & Nutrition Sciences, Tuskegee University, Tuskegee, Alabama

Bovine feeding systems are a popular debate topic between producers and consumers. As a result, this has increased the interest in alternative agriculture practices due to concerns for animal welfare and health-conscious foods. This study examines consumer preferences and perceptions regarding local organic beef compared to grain-finished beef in the Alabama Black Belt region of the United States. The focus will be on factors influencing purchasing decisions and overall satisfaction. Through qualitative and quantitative analysis, this study will assess consumer preferences regarding taste, texture, and perceived health benefits. Through multiple methods, including surveys and focus groups, key variables will be identified and will consist of these factors. The research will provide insight into the health and sustainability of organic beef, whether it is more nutritious and less chemically altered than grain-fed beef. The sensory panels, surveys, and focus group discussions will determine consumers' perceptions of organic and grain-finished beef. What is found from this research may offer valuable insight for producers looking to align their production methods to meet consumer expectations and promote sustainable and ethical practices. This study aims to inform producers and those who market the meat about strategies to improve public perception and support of alternative beef feeding systems. Focusing on the Alabama Black Belt region can provide more local insights that can contribute to broader research regarding food production practices in the United States.

Keywords: Beef, Nutritional value, Diet, Digestible fibers, Meat Quality

Research Support: USDA-NIFA GRANT#NI241445XXXXG014

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Using Methyltransferase Inhibitors to Sensitize Cancer Cells to Statins

Tyler Smith¹, Tiffany Melhuish², David Wotton, PhD²

¹Department of Biology, Tuskegee University, Tuskegee, AL; ²UVA Comprehensive Cancer Center, University of Virginia, Charlottesville, VA

Statins are drugs that are known for their cholesterol-lowering effects. They have shown some potential in cancer therapy by inhibiting tumor cell growth. However, there is a need to further sensitize cancer cells to statins for them to be effective therapeutics. This project investigates whether methyltransferase inhibitors can enhance the sensitivity of cancer cells to statins without harming normal cells. Here we compared a normal mouse mammary gland cell line (NMMuMg) and a mouse breast cancer cell line (4T1), that is a model for triple negative breast cancer. Cells were treated with statins, methyltransferase inhibitors, or a combination of the two, and cell number was quantified using the crystal violet assay. Additionally, we analyzed expression of cholesterol biosynthetic enzymes to monitor the cells' response to these inhibitors. Our findings suggest that select methyltransferase inhibitors can sensitize cancer cells to statin treatment, while having little effect on the normal cells. This offers a potential pathway for improving the effectiveness of statins in cancer therapy.

Wotton Lab Funding: NCI U54 CA274499, UVA CCC

Disparities in 5-year Relative Survival Rates of Cervical Cancer by Age and Stage at Diagnosis between African Americans and Whites, in the USA, from 2016 to 2022

Milahni Wilkerson, Ehsan Abdalla

Department of Graduate Public Health, College of Veterinary Medicine, Tuskegee University

The five-year relative survival rate (RSR) for Cervical Cancer (CerCancer) in the United States is 66%, varying significantly by stage at diagnosis. Early-stage CerCancer has a higher survival rate, approximately 91%, while later stages (regional or distant) have lower rates, with the regional stage around 61% and the distant stage around 19%. To compare differences in CerCancer RSRs by age and stage at diagnosis between African American (AA) and Whites in the U.S. Using data from the 2016–2022 SEER (Surveillance, Epidemiology, and End Results) database, we

analyzed 356 AA and 4,612 Whites diagnosed with CerCancer. RSRs were compared AA and Whites by age and stage at diagnosis using SEER*Stat software. At the localized stage, Whites aged 15–44 had an RSR of 97.1% (95% CI, 95.5–98.2), consistently higher than AA, except those aged 45–54 and 55–64, who had slightly higher RSRs at 94.6% and 91.6% (95% CIs: 77.0–98.8 and 65.2–98.2), respectively. At the regional stage, Whites had better survival overall, with an RSR of 60.7% (95% CI, 50.3–69.5). The exception was AA aged 75 and older, who had a higher RSR of 56.2% (95% CI, 0.2–94.9) than Whites in the same age group. At the distant stage, both AA and Whites aged 15–44 had similar lower RSRs of 31.5% (95% CI, 19.8–30.1). AA aged 55–64 and 65–74 had higher RSRs of 22.6% and 25.3% (95% CIs: 9.10–39.7 and 6.2–50.6) than their White counterparts. Among those aged 75 and older, Whites had a higher RSR (7.4%, 95% CI: 1.9–17.9). For cases with an unknown stage, Whites aged 15–44 had an RSR of 91% (95% CI, 73.5–97.2), again higher than AA. However, AA aged 45–54 had a higher RSR of 67.3% (95% CI, 5.1–94.9) compared to Whites in the same age group. Significant disparities in CerCancer survival exist by race, age, and stage. Overall, AA had lower RSRs than Whites, underscoring persistent disparities in cervical cancer outcomes among these two groups.

Maternal Mental Health Disparities Among Black Women

Shardai Holmes and Jailynn Williams, Senior Nursing Students

Faculty Mentor, Dr. Cordelia Nnedu, Department of Nursing, Tuskegee University

Black women in the United States face significant disparities in maternal mental health due to systemic racism, cultural stigmas, and limited access to quality care. This paper synthesizes evidence from five scholarly sources to explore the factors contributing to these disparities and strategies for addressing them. Black women experience higher rates of Postpartum depression but often encounter barriers to diagnosis and treatment, including racial bias and mistrust in healthcare systems. The paper highlights the importance of culturally competent care, which requires both healthcare provider training and increased access to mental health resources. Additionally, it calls for systemic policy changes to improve maternal healthcare, reduce inequities, and support Black women throughout the maternal journey. The findings emphasize that comprehensive solutions—including healthcare reform, better provider education, and policy advocacy—are essential to reducing maternal mental health disparities and improving outcomes for Black mothers and their children.

Keywords: Black maternal health, postpartum depression, healthcare disparities, systemic racism, cultural competency

Reducing Preterm Birth Rates in Black Women: A Synthesis of Evidence on Culturally Sensitive Prenatal Care

Christina Dunlap and Zykeria Butler, Senior Nursing Students

Faculty Mentor, Dr. Cordelia Nnedu, Department of Nursing, Tuskegee University

Preterm birth remains a significant public health concern, with notable racial disparities affecting maternal and infant health outcomes. African American and immigrant women experience disproportionately higher rates of preterm birth due to structural, social, and healthcare-related factors. This paper synthesizes findings from five research articles to examine the role of prenatal care models, socioeconomic determinants, and access to healthcare in mitigating racial disparities in preterm birth rates. The synthesis highlights evidence-based interventions and their potential impact on reducing racial disparities in maternal health outcomes.

Keywords: Preterm birth, Black women, prenatal care, health disparities, maternal health

Early Implementation of the Sepsis Bundle on Patient Outcomes

Nyasia Starks and Israel Daniel, Senior Nursing Students

Faculty Mentor, Dr. Cordelia Nnedu, Department of Nursing, Tuskegee University

Sepsis is a leading cause of morbidity and mortality in hospitalized adults, as it requires swift identification and intervention to prevent rapid patient decline. Sepsis bundles are routine, standardized protocols for early recognition and management that have been integrated into hospital settings based on evidence-based research. This paper analyzes and evaluates whether earlier implementation of sepsis bundles compared to delayed intervention or standard care improves patient outcomes. Reviewing five research studies, this paper provides insight into the significance and effectiveness of early intervention in sepsis care. Article findings suggest that early sepsis protocol intervention decreases patient mortality rates, improves interprofessional teams' adherence to sepsis protocols, and strengthens overall patient outcomes. Inconsistent adherence to sepsis protocols throughout hospitals remains a challenge. Consequently, future research should focus on improving compliance and managing barriers to timely implementation.

Keywords: sepsis; septic shock; Sepsis Bundle, early intervention, patient outcomes, morbidity, mortality, protocol adherence

Traditional Diet vs. Plant-Based Diet; influence on Chronic Disease Incidence

Anica Blackmon, Jordan Lawson and Michael Guinoo, Senior Nursing Students

Faculty Mentor, Dr. Cordelia Nnedu, Department of Nursing, Tuskegee University

This paper explores the impact of traditional versus plant-based diets in reducing chronic disease risk—specifically hypertension, diabetes, and cardiovascular disease—in Black populations over 1-5 years. Using five key studies, this synthesis compares the effects of these two dietary patterns on chronic disease outcomes. Traditional diets, often rich in processed foods and unhealthy fats, are linked to higher risks of these conditions. On the other hand, plant-based diets, which emphasize whole grains, fruits, and vegetables, show promise in lowering chronic disease risk by improving blood pressure, glucose levels, and overall heart health. The findings underscore the importance of nutrition in managing chronic diseases and provide healthcare professionals with evidence-based recommendations for promoting healthier diets in Black communities. These insights could help reduce health disparities and inform public health strategies aimed at disease prevention.

Keywords: Black populations, chronic diseases, traditional diet, plant-based diet, hypertension, diabetes, cardiovascular disease



History of Phi Zeta Research Day

Phi Zeta Research Day in the College of Veterinary Medicine at Tuskegee University was envisioned by Dr. Ruby L. Perry in September 2012 as part of the annual Biomedical Research Symposium, which is now recognized as the One Health Symposium. Through Dr. Perry's vision, Phi Zeta Research Day has grown into a hallmark annual scientific event. The inaugural event was chaired by Dr. Ebony Gilbreath, who has continued to play a pivotal role in advancing its mission. As Interim Dean, Dr. Gilbreath has further strengthened this initiative, ensuring its continued impact in fostering research, scholarship, and innovation within the veterinary medical community. Students will explore career prospects in research and post-graduate educational programs. Students benefit from learning about how the connectivity of healthy people, good environment, and healthy animals is critical in influencing the future direction of healthcare and biomedical research in conjunction with the One Health Symposium. The yearly event also serves as a forum for scientists and educators to interact and share information to advance translational research toward disease treatments and prevention in human and animal health.

Phi Zeta Research Day is designed and integrated with the Phi Zeta Honor Society's goal, which is to “recognize and promote scholarship and research in matters pertaining to the welfare and diseases of animals”. The Rho Chapter of Phi Zeta Honor Society was established at Tuskegee University in 1967. Students at Phi Zeta Research Day are honored with research awards, research scholarships, and other recognitions. From 2012 through 2024, hundreds of students and guests participated, and many students presented their research work in the form of posters and oral presentations.

Objectives of the event are to:

1. Encourage students to share their research with scientific community
2. Enhance the pertinent skill of being able to present and translate research data to a diverse audience
3. Provide a forum for the presentation of research being performed at Tuskegee University College of Veterinary Medicine and facilitate collegial interactions and networks

We are excited and honored to present the 13th Annual Phi Zeta Research Day at Tuskegee University College of Veterinary Medicine. It is our pleasure to present the research of TUCVM students. It is our hope that all the participants of the Biomedical Research Symposium will enjoy the scientific endeavors showcased by our students.



Phi Zeta Speaker

Solomon Wole Odemuyiwa, DVM, PhD, DACVM

Interim Associate Dean for Academic and Student Affairs,
Professor of Pathobiology and Associate Dean for Preclinical Curriculum,
College of Veterinary Medicine, Tuskegee University



Dr. Solomon Odemuyiwa completed his DVM degree at the University of Ibadan Nigeria, followed by the MS and PhD degrees in virology at the same university. For his PhD work, he spent two years at the Bernhard-Nocht-Institute of Tropical Medicine, University of Hamburg as a DAAD scholar. This was followed by two years at the National Public Health Laboratory in Luxembourg as a doctoral scholar. Odemuyiwa subsequently completed postdoctoral training in immunology at the University of Alberta, Edmonton; following which he completed a DVSc degree combined with residency in clinical pathology at the Ontario Veterinary College, University of Guelph, Ontario, Canada. His research interests span immunology, virology, and molecular diagnostics with emphasis on zoonotic diseases. Odemuyiwa is board-certified in virology by the American College of Veterinary Microbiologists (ACVM).



Phi Zeta Keynote Speaker

Robin L. Burke, DVM, MPH, DACLAM, DACVPM

Professor, Laboratory Animal Medicine, Attending Veterinarian, Director,
Comparative Medicine Resource Center, Department of Pathobiology,
College of Veterinary Medicine, Tuskegee University



Dr. Robin Burke spent 22 years serving as an active-duty Army servicemember. She retired in 2025 at the rank of Colonel before accepting a position at Tuskegee University College of Veterinary Medicine. Burke is board certified in the American College of Laboratory Animal Medicine (LAM) and the American College of Veterinary Preventive Medicine. Her LAM residency training was performed at US Army Medical Research Institute of Infectious Diseases (USAMRIID), where gained experience working in biocontainment (ABSL-3 and ABSL-4).

After receiving a direct commission into the United States Army Veterinary Corps in 2003, Burke's assignments included Connecticut; South Korea; Maryland; Bangkok, Thailand; Virginia; Lima, Peru; and Texas. She served as Consultant to the Air Force Surgeon General and was the 64C (LAM) Consultant to the US Army Surgeon General for 4 years. She is a member of the American Veterinary

Medical Association, the American Association for Laboratory Animal Science, and the Association of Primate Veterinarians. Burke also supports AAALAC International as an ad hoc Specialist, assisting members of the Council on Accreditation in evaluating animal care and use programs worldwide. Her military awards and decorations include the Legion of Merit, Meritorious Service Medal (5 total), Army Commendation Medal (2 total), US Army Achievement Medal (3 total), and Overseas Service Ribbons (3 total).

Burke is a passionate advocate and voice for the animals that are critical to biomedical research in research models. She strives always to take a common-sense, collegial approach to problem-solving in a research environment. Outside of work, she lives with her elementary teacher husband, Bryan Shaw. They have one daughter, Katherine, who is a senior in the College of Engineering at Auburn University. Burke's hobbies mostly focus on travel and dog sports (especially flyball and nosework) with her two dogs.

Phi Zeta Speaker

Yesutor K. Soku, DVM, MS

Interdisciplinary Pathobiology PhD Student,
College of Veterinary Medicine, Tuskegee University



Hepatic Metabolic Reprogramming in Channel Catfish (*Ictalurus punctatus*) During *Aeromonas hydrophila* Infection Reflects Nutritional Regulation of Acyl-CoA, Sterol and Tri-carboxylic Acid (TCA) Pathways

Yesutor K. Soku¹, Karl Hayden¹, Ida Phillips², Abdelrahman Mohamed,¹ ¹ Department of Pathobiology, College of Veterinary Medicine, Tuskegee University, ² North Carolina Veterinary Diagnostic Laboratory System, Raleigh, North Carolina

The liver functions as a hub for metabolic and immune responses during infection, especially in aquaculture species where nutritional state may influence disease outcomes. This study examined how feeding status modulates hepatic metabolic responses in channel catfish (*Ictalurus punctatus*) during *Aeromonas hydrophila* infection. Fed and unfed fish were challenged with virulent *A. hydrophila* and the liver sampled at 2, 4, and 8 hours post-challenge for histological and transcriptomic analysis. Histopathology revealed preserved hepatic architecture in fed fish, while unfed fish developed progressive vascular congestion, edema, and inflammatory infiltration. Transcriptomic profiling identified significant nutritional effects on liver metabolism. In unfed groups, genes involved in the acyl-CoA biosynthetic process (*tecrb*, *hacd2*, *acsl2*) were enriched but downregulated, suggesting impaired fatty acid processing. TCA cycle activity was also exclusive to unfed fish, marked by altered expression of key mitochondrial enzymes (*idh2*, *aco2*, *suc1g1*), indicating metabolic stress adaptation. In contrast, fed fish showed enrichment in oxidoreductase activity related to cholesterol biosynthesis (*dhcr24*, *dhcr7*, *tm7sf2*), though these transcripts were similarly downregulated. KEGG pathway analysis confirmed that fatty acid elongation, steroid biosynthesis, and PPAR signaling were predominantly enriched in unfed fish, reflecting a shift toward catabolic conservation and lipid remodeling under nutrient deprivation. These findings demonstrate that nutritional state shapes both liver tissue integrity and metabolic gene expression during infection, offering insights into the interplay between feeding, hepatic metabolism, and disease resilience in aquaculture.

Research Support: This study was supported by USDA/NIFA # NI23AHDRXXXXG067 and USDA-ARS Project # 6010-32000-027-000D.

Phi Zeta Speaker

Barbara Eves, BS, DVM

Specialist, Technical Publications, Purina Institute



Dr. Barbara Eves is a technical writer and editor with experience in the pet supplement and nutrition industries. She has worked as a Specialist, Technical Publications for the Purina Institute for the past six years. In this position, she is responsible for sharing breakthrough nutrition science to inspire veterinary healthcare professionals on the power of nutrition and for building awareness of the Purina Institute as a leading authority on pet nutrition.

Prior to this role, Eves worked for over 20 years for a supplement company and before that was a practicing veterinarian in general small animal practice. In her free time, she enjoys traveling and spending time with family, as well as keeping her dog Woody occupied and out of trouble (no small feat!).



Phi Zeta Oral Presenter

Amber D. Cooper

Third Year DVM Student
College of Veterinary Medicine, Tuskegee University



Anatomical Characteristics of the Roots of Maxillary First Molar Teeth in Dogs Assessed by Computed Tomography

Amber D. Cooper, Marc Alkhal, and Noriko Aoi
Department of Clinical Sciences, College of Veterinary Medicine, Tuskegee University, Tuskegee, AL

Veterinary practitioners often face challenges in evaluating and treating the maxillary first molar teeth in dogs due to their caudal location within the oral cavity and the presence of adjacent structures such as the hard palate, zygoma, cheek tissue and orbit. These teeth have three roots—mesial, distal, and palatal—and are positioned adjacent to the fourth premolars and second molars, leading to overlapping structures on intraoral radiographs. This superimposition, combined with a limited understanding of root morphology, can complicate extractions, periodontal assessment, and other dental procedures. In this study, computed tomography (CT) was used to obtain detailed images of the maxillary first molars in 20 adult canine cadavers. Each of the three roots was measured for length and width at both the base and mid-root levels. Additionally, the presence and direction of root curvatures were evaluated. The mean lengths of the mesial, distal and palatal roots of the right and left maxillary first molars were 10.8 mm and 10.7 mm, 10.3 mm and 10.2 mm, 8.4 and 9.6 mm, respectively. The mesial and distal roots were similar in length, while the distal roots were approximately 20% shorter. Root widths were reduced at the mid-root by 29-37% compared to the base. Approximately 80-88% of the roots demonstrated curvature. These findings provide a more detailed anatomical understanding of this region and support more effective clinical management of maxillary molars in dogs.

Research and Student Support: Grant# DHHS/HRSA D34HP00001-35-00

Phi Zeta Oral Presenter

Aniyah Ragland

Second Year DVM Student
College of Veterinary Medicine, Tuskegee University



Pathology Unveiled: Investigating Lung lesions through Gross and Histopathological Examinations

Aniyah Ragland, Mohamed R. Mousa, Asmaa Al-Mokaddem, Roslyn Casimir, and Sherein S. Abdelgayed
College of Veterinary Medicine, Tuskegee University,
Tuskegee, AL

From May 12 to July 12, 2025, a comprehensive postmortem investigation was conducted on 50 animals from seven species to evaluate pulmonary pathology and enhance understanding of respiratory disease processes. Of the 50 necropsied cases, 35 exhibited lung lesions of varying etiologies, distributions, and severities. The affected animals included 18 dogs, 8 cats, 3 chickens, 3 goats, 1 swine, 1 equine, and 1 Asian water monitor. Notably, no prior history of respiratory disease was reported in these cases, underscoring the role of necropsy in uncovering subclinical or undiagnosed pathology. Lesions were anatomically classified into four major categories: airwaycentered (bronchitis, peribronchitis, aspiration pneumonia), alveolar/parenchymal (interstitial pneumonia, granulomatous pneumonia, emphysema, atelectasis, fibrosis, osseous metaplasia), vascular (heartworm-associated lesions, pulmonary congestion, pulmonary edema), and pleural (pleurisy). Severity ranged from acute and reversible conditions to chronic, fibrosing, or degenerative changes. Gross lesions were varied: pulmonary congestion, frothy exudates, parasitic infestation, aspiration pneumonia, and lung consolidation, further characterized by histopathology, revealing inflammatory cell infiltration, alveolar septal thickening, vascular thrombosis, parasitic structures, and fibrotic remodeling. Special histochemical stains—Alcian blue, PAS, Masson's trichrome (MTC), and Gram —were utilized selectively. These findings emphasize the diagnostic value of postmortem examination supported by histopathology in detecting and differentiating pulmonary disease, and they highlight the diversity of respiratory pathology across species.

Research Grant: 2025 Tuskegee Veterinary Scholars Program (TVSP)

Phi Zeta Oral Presenter

Kendall Walden

Second Year DVM Student,
College of Veterinary Medicine, Tuskegee University



Gremlin1 Overexpression in Nephron Progenitors Impairs their Maintenance and Differentiation into Nephrons

Kendall Walden, Esraa Alnahrway, Fentahun Abate, Pawan Puri, Tuskegee University, College of Veterinary Medicine, Tuskegee, AL

Approximately 35.5 million Americans suffer from chronic kidney disease, with variation in nephron number being a potential predisposing factor. Therefore, it is critical to define the mechanisms that govern the renewal and differentiation of nephron progenitor (NP) cells into nephrons. Gremlin 1 (GREM1), a BMP signaling antagonist, is a critical protein in kidney development and function. Global deletion of GREM1 in mice leads to kidney agenesis. However, the consequences of overexpression of GREM1 in NP lineage remain unknown. We hypothesized that GREM1 overexpression in NP lineage will disrupt nephrogenesis. To test this hypothesis, we generated conditional mutant mice in which GREM1 expression was induced in Six2+ve cells and their derivatives. Six2-Cre-GREM1 mutant mice at 3-wks of age had significantly decreased kidney weight to body weight ratio and fewer nephrons. Histological analysis showed that mutant mice had impaired glomerulogenesis and dilated tubules. Mutant kidneys showed reduced size at postnatal day 1 (P1), with dilated tubules and impaired glomerular tuft formation. Immunofluorescence (IF) analysis revealed disrupted development across all nephron segments. Markers for NP (ITGA8) and ureteric buds (UB) (TROMA1) showed a reduction in NP caps and UBs. NP-derived epithelial structures such as renal vesicle and S-shaped body that express NCAM1 and WT1 were fewer in the mutant vs control. Co-IF with markers of podocyte (WT1), mesangial (GATA3), and endothelial (CD31) cells indicated defective glomerular tuft development. Together, our results show that X overexpression in NP lineage impairs renal development by disrupting NP maintenance and differentiation into all nephron segments.

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Student Support: DHHS/HRSA D34HP00001-35-00, Boehringer Ingelheim Veterinary Scholars Program, and NIH/NIMHD RCMI grant # U54MD007585

Phi Zeta Oral Presenter

Juanita Smith

Second Year DVM Student
College of Veterinary Medicine, Tuskegee University



Optimizing Maropitant Transdermal Delivery: Synthesis and In Vitro Evaluation of Solid Lipid Nanoparticles

Juanita Smith, Temesgen Smauel, Dilip Reddy Gunturu
Department of Biomedical Sciences (Smith, Gunturu);
Pathobiology (Samuel), College of Veterinary Medicine, Tuskegee University, AL

Transdermal delivery systems for drugs have revolutionized therapeutic approaches by driving drugs through the skin non-invasively and into circulation. Such systems offer extended and controlled drug delivery, comfort for the patient, reduced dosing frequency, and enhanced drug stability. By circumventing hepatic first-pass metabolism, the plasma concentrations of drugs are enhanced by transdermal agents. This study involves the synthesis of solid lipid nanoparticles (SLNs) of Maropitant for delivery through the skin in a transdermal manner. Maropitant, used in animal drugs as an anti-emetic for canines and felines, has conventionally been administered as a pill or in injectable dosages. We utilized the injectable form in preparing SLNs, which include a surfactant outer surface and lipid core with drug dissolved in it. Such nanoparticles containing drugs can be delivered through the skin and offer drugs by sustained delivery. The methods used in the study include ultrasonication, emulsification using solvent, extrusion, sonication, freeze-drying, and gelation. We will examine particle size, zeta potential, encapsulation efficiency, and in vitro diffusion using Franz cells with Strat-M membrane. This research aims to expand transdermal formulations for cats, addressing Maropitant's high molecular weight and improving compliance and dosing frequency. Lipid matrix mimics lipids in the feline skin and enhances penetration and diminishes irritation.

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Phi Zeta Oral Presenter

Esraa Alnahrawy

Interdisciplinary Pathobiology, Ph.D. Student
College of Veterinary Medicine, Tuskegee University



Ohio

Investigating the Role of Protein Kinase A (PKA) Signaling in Renal Development and Cystogenesis

Esraa Alnahrawy^{1,2}, Fentahun Abate¹, Lawrence Kirschner³, Pawan Puri¹

¹Department of Biomedical Sciences, Tuskegee University College of Veterinary Medicine, Tuskegee, Alabama. ²Department of Anatomy and Embryology, University of Sadat City, College of Veterinary Medicine, Egypt. ³Division of Endocrinology, Diabetes and Metabolism, The Ohio State University College of Medicine, Columbus,

Autosomal dominant Polycystic Kidney Disease (ADPKD) is a kidney disorder that affects more than 15 million people worldwide and is characterized by renal cystogenesis that ultimately leads to renal failure. The genetic basis of ADPKD involves mutations in the *Pkd1* and *Pkd2* genes. Aberrant activation of the cAMP/PKA signaling pathway is one of the best-established downstream mechanisms following *Pkd* mutations. In PKD patients, cysts arise predominantly from the collecting ducts, though they may originate from other nephron segments. Direct activation of PKA signaling in collecting ducts has been shown to drive cystogenesis. However, the effect of PKA activation *in vivo* in nephron segments remains unexplored. Protein kinase A (PKA) is a tetrameric holoenzyme composed of two catalytic and two regulatory subunits. One of the important PKA regulatory subunits is encoded by the gene *Prkar1a* and has a well-established function to inhibit PKA activity. To study the effects resulting from aberrant activation of PKA in the kidney, we used Cre-lox technology to generate conditional knockout mice, *Six2-Cre^{+/+}; Prkar1a^{fl/fl}* (*Prkar1aKO^{NP}*) that lack *Prkar1a* in all nephron segments using *Six2-Cre* mice. We hypothesized that the deletion of *Prkar1a* would impair renal development and induce cystogenesis. *Prkar1aKO^{NP}* were born at the expected Mendelian ratio; however, they did not survive beyond postnatal day 1. The kidney-to-body weight ratio was significantly lower in mutants vs. controls. Histological analysis revealed a reduced nephrogenic zone in mutant kidneys. One of the most striking defects was glomerular maldevelopment, characterized by poorly formed capillary loops with sparse mesangial cell support and lining by a few disorganized podocytes. Some glomeruli exhibited an expanded Bowman's space with a cystic appearance. Immunostaining with the podocyte markers, the endothelial markers, and the mesangial markers confirmed that the glomerular tufts were severely underdeveloped and accompanied by expanded Bowman's spaces. Collectively, our results demonstrate that *Prkar1a* deletion disrupts renal and glomerular development.

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Phi Zeta Poster Presenters

Alternations in the Enterochromaffin-Enriched Cell Genes in the Mouse Model of Gastric Preneoplasia is Associated with Relative Decrease in their Population

Fentahun Abate, Esraa Alnahrawy and Pawan Puri

Department of Biomedical Sciences, Tuskegee University College of Veterinary Medicine, Tuskegee, Alabama

According to the World Cancer Research Fund, gastric cancer is the fifth most common tumor worldwide. Gastric preneoplastic lesions precede and represent critical intermediary steps in the pathway to gastric cancer, yet the underlying mechanisms contributing to these lesions are not fully defined. To investigate this, we recently developed and published about a mouse model of gastric neoplasia in which constitutively active PKA (CA-PKA) is expressed in the gastric mesenchyme, leading to preneoplastic lesions in the epithelium. These lesions were characterized by spasmolytic polypeptide-expressing metaplasia, intestinal metaplasia, and increased inflammatory cell infiltration. The CA-PKA mice exhibited dramatic alterations in gastric epithelial populations, including hyperplasia of mucus and tuft cells, and a decrease in parietal, chief, and endocrine cells. Our reanalysis of bulk mRNA Seq revealed significant downregulation of multiple enterochromaffin-enriched genes in the mutant corpus, including *Chga*, *Ret*, *Nphs1*, *Gdf9*, *Amer3*, *Vstm2-1*, *Rbpjl*, *Kirrel2*, *Baiap3*, *Vwa5b2*, *Kcnh6*, *Lhx5*, *NKX2-2*, *Rfx6*, *Arx*, *Insm1*, and *Slc35d3*. Further immunofluorescence analysis using antisera against Ret and NPHS1 showed co-expression of these proteins in the enterochromaffin cell population identified by Chromogranin A (CHGA). IF analysis demonstrated a localized loss of RET and NPHS1 expression, indicating that the decrease in enterochromaffin cells is predominantly due to massive hyperplastic lesions. Additionally, we observed ectopic Ret expression in CHGA-negative gastric epithelial cells, suggesting that Ret, which has a well-established role in branching morphogenesis, may contribute to increased branching in CA-PKA lesions. Together, our results identify enterochromaffin-enriched genes that are misregulated in CA-PKA mice, establish Ret and NPHS1 as markers of enterochromaffin cells, and demonstrate mislocalization of Ret in the context of gastric preneoplasia.

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Effects of Age and Circadian Rhythm on Vital Parameters and Erythrocyte Osmotic Fragility of Donkeys During Seasonal Changes

²Binhambali Abdulhakeem, ¹Olorunfemi Moses Ayo-opemipo, ²Sinkalu Victor Olusegun, ⁴Babashani Mohammed, ³Samuel Felix Uchenna, ¹Ayo Joseph Olusegun

¹Department of Veterinary Physiology, Faculty of Veterinary Medicine, Ahmadu Bello University, Zaria, Nigeria,

²Department of Clinical Sciences, College of Veterinary Medicine, Tuskegee University, Tuskegee, United States of America, ³ Translation Research in Pain, College of Veterinary Medicine, NCSU, Raleigh, NC, United States of America, ⁴Ahmadu Bello University Veterinary Teaching Hospital, Zaria, Nigeria, ⁵ National Animal Production

Research Institute, Ahmad Bello University, Zaria, Nigeria

This study investigates the effects of seasonal variations on the erythrocyte osmotic fragility and vital parameters of donkeys (*Equus africanus asinus*) at the National Animal Production Research Institute (NAPRI) in Shika, Kaduna State, Nigeria. The research focused on two key periods: the hot-dry season (April) and the rainy season (July). Twelve donkeys were classified into three age groups: young (1–3 years), adult (4–6 years), and old (7–9 years). Blood samples were collected at six-hour intervals over a 24-hour period, while dry-bulb and wet-bulb temperatures were measured to compute the temperature-humidity index (THI). Vital parameters including rectal temperature, respiratory rate, and heart rate were also recorded. Results showed higher dry-bulb temperatures (DBT) during the hot-dry season, with the lowest DBT of 12°C at 00:00 h and the highest of 25.5°C at 18:00 h. Young donkeys exhibited the highest erythrocyte osmotic fragility during the hot-dry season, while old donkeys showed elevated fragility during the rainy season. Results also demonstrated that erythrocyte osmotic fragility varied significantly with age and season, with young donkeys exhibiting the highest fragility during the hot-dry season at a 0.3% NaCl concentration. However, old donkeys showed increased fragility during the rainy season, which shows the influence of both age and environmental conditions on erythrocyte stability. Also, rectal temperatures were higher in young

donkeys during the hot-dry season compared to adults, while heart rates showed significant elevation across all age groups during the rainy season. Overall, this study elucidates the physiological adaptations of donkeys to seasonal thermal stress, providing critical insights into their health management and welfare in varying climatic conditions. Understanding these dynamics is essential for optimizing donkey husbandry practices, especially in regions facing climate variability. These findings contribute valuable knowledge to the field of veterinary physiology and highlight the necessity of tailored management strategies to mitigate the impact of seasonal stressors on animal health.

Microbial Evaluation of Inoculated Fresh Meat Utilizing Imaging and Computer Vision

Keshauna Davis, Clarissa Harris, and Benjamin Adu-Addai

Meat Science and College of Veterinary Medicine Laboratory, College of Agriculture, Environment and Nutrition Sciences, Tuskegee University, Tuskegee, Alabama

The objective of this study is to evaluate microbial contamination in inoculated fresh meat using advanced imaging technologies, aiming to enhance food safety and preservation methods. Fresh meat samples were inoculated with *Salmonella* spp. and analyzed using a fluorescence spectroscopy system to monitor cell activity and morphology. Methodology conditions included fluorescence imaging to assess microbial activity and advanced visualization to examine cell morphology in ground meat. Preliminary results indicate that cell morphology remained intact under the conditions tested, suggesting stability in cellular structure despite microbial inoculation. These findings contribute to the understanding of all types of microbial behavior and the effects it can have on meat quality and preservation. In conclusion, further research is required to refine imaging techniques and explore broader applications in food safety monitoring at all different levels.

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Serosurveillance of Domestic Cats for Exposure to H5 Avian Influenza

Kelsie J. Glass¹, Dawne K. Rowe¹, S. Mark Tompkins^{1,2}

¹Center for Vaccines and Immunology, University of Georgia, College of Veterinary Medicine, Athens, GA

²Department of Infectious Diseases, University of Georgia, College of Veterinary Medicine, Athens, GA

Influenza A virus has posed a significant threat to public health over the past two centuries, with notable pandemics such as the 1918 Spanish Flu and the 2009 Swine Flu. Their high mutation rate coupled with the potential for genetic reassortment, enable influenza A viruses to rapidly evolve and cross species barriers. A recent notable example is the clade 2.3.4.4b highly pathogenic H5N1 avian influenza virus detected in North America since 2022, which has spread extensively through wild birds and spilled over into many mammalian hosts—including humans, cattle and felines—underscoring the virus’s pandemic potential and zoonotic threat. Infection of cats has been primarily linked to wild bird exposure, but the ingestion of raw poultry and, more recently, the consumption of raw infected milk are also potential routes of exposure. The feline H5N1 infections reported in the U.S. are >90% fatal, however there may be additional, undiagnosed infections and the true number of infections is unclear. We hypothesized that exposure of cats to H5 influenza is greater than the reported cases. Using contemporary and archived feline serum samples, we conducted serological analysis for the presence of influenza-specific and H5 avian influenza-specific antibodies using commercial ELISA tests. We compared sera collected from the University of Georgia Veterinary Teaching Hospital prior to the introduction of the 2.3.4.4b H5 clade (pre-2022) and current (2022 to present) samples as the North American zoonotic event began in 2022. We first screened for influenza-specific (nucleoprotein (NP) -specific) antibodies using commercially available competition ELISA kits from IDEXX and Innovative Diagnostics (ID-Vet). Confirmed NP-positive sera were then tested for H5 reactivity using the ID-Vet ID Screen® Influenza H5 Antibody Competition ELISA.

We screened 299 serum samples from pre-2022 and 78 serum samples from 2022-present. Most samples were negative for Influenza A NP antibodies, however, 5 pre-2022 and 1 2022-present samples were positive for NP antibodies, indicating prior influenza A virus infection. None of the NP-positive samples were positive for antibodies to H5 influenza virus. We are currently testing positive samples for reactivity to other influenza subtypes. The seropositivity is too low to accurately assess exposure rates at this time. Further sample collection from local and regional animal

hospitals, shelters and sterilization programs is ongoing. Testing of additional samples, including sera from peridomestic cats is warranted to better define the extent of influenza and H5N1 influenza exposure in felid populations within the U.S. and to better understand the epidemiological risk of zoonotic transmission in this region.

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Tracking Waterborne Pathogens: Isolation and Molecular Detection of Pathogenic *Escherichia Coli* from Lake Tuskegee in Tuskegee, Alabama

Quintera Gordon, Alexis Smith, Rawah Faraj*

Department of Pathobiology, College of Veterinary Medicine, Tuskegee University, Tuskegee, Alabama

Escherichia coli is a waterborne pathogen that poses a significant public health risk, especially in recreational and surface water bodies. Although many *E. coli* strains are harmless commensals, pathogenic types can cause severe gastrointestinal illness and complications, including hemolytic uremic syndrome. This study aimed to evaluate the microbial quality of Lake Tuskegee in Alabama by detecting *E. coli* contamination and assessing the prevalence of the virulence-associated *eae* gene through molecular techniques. A total of 100 water samples were collected from different locations around the lake. Presumptive *E. coli* isolates were obtained using selective culture media, followed by DNA extraction and PCR amplification of the 16S rRNA gene for confirmation. Additionally, PCR was employed to detect the *eaeA* gene, which encodes the intimin protein linked to EPEC strains. Results showed that 94% of the samples tested positive for *E. coli* strains based on 16S rRNA gene amplification, and 43% of these isolates contained the *eaeA* gene, suggesting potential pathogenicity. Sequence analysis with the NCBI BLAST tool revealed 100% similarity between our isolates and reference sequences of *E. coli* strains, including *E. coli* O157:H7. The detection of strains expressing the *eaeA* gene in Lake Tuskegee indicates a potential health threat to individuals exposed to the water. These findings highlight the importance of continuous microbial monitoring and the implementation of effective water quality management strategies to reduce the risk of waterborne disease transmission.

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Metabolomics Application: Authentication and Detection of Antibiotic Residues in Milk

Andrew Heatherton¹, Brandon Gines², David McKenzie³, Melissa Boersma⁴, and Teshome Yehualaeshet¹

¹College of Veterinary Medicine, ²Department of Chemistry, Tuskegee University, ³Department of Large Animal Clinical Sciences, Tuskegee University, ⁴Auburn University Department of Science and Mathematics, Auburn University

Milk is a staple in the global food supply, making its authenticity and safety crucial for public health. This study explores the application of metabolomics in authenticating milk and detecting antibiotic residues which are important key aspects of food safety. We employed Nuclear Magnetic Resonance (NMR) spectroscopy to analyze the metabolomic profiles of various milk types, including cow, goat, and plant-based alternatives. Antibiotic residue detection was conducted using mass spectrometry (MS) analysis.

Milk samples were sourced from farms and retail stores to ensure diversity and representativeness of the samples. Each sample underwent a standard metabolomics to extract the metabolites. NMR samples were reconstituted with D₂O and analyzed using TopSpin and MetaboAnalyst 6.0. For the MS analysis, the control antibiotics standard used were erythromycin, sulfamethoxazole, penicillin, and tetracycline.

Our findings indicate that cow's milk has higher sugar and citrate content compared to goat milk, while oat milk among plant-based options contains the most lactose and glucose. ANOVA confirmed that pasteurized cow's milk had significantly higher lactose-to-sucrose ratios than unpasteurized and goat milk. This study has laid the groundwork for a validated protocol in metabolomic profiling and detection antibiotic residue, highlighting the potential of metabolomics in milk authentication and future applications in food safety regulation and quality control.

Keywords: Mass Spectrometry, Nuclear Magnetic Resonance, Antibiotic Residues, & Milk Authentication.

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The Relationship Between Locomotion Scores and Milk Production

Saniya Keeton^{1,2}, Elise Shepley², Towfiquir Rahman², Gerard Cramer²

¹Tuskegee University, College of Veterinary Medicine, Tuskegee, AL, ²Department of Veterinary Population Medicine, University of Minnesota-St. Paul, MN

Lameness is a significant welfare and economic concern in the dairy industry that negatively affects milk production, reproduction, and overall herd health. The study objective was to evaluate the relationship between lameness severity and milk production in lactating dairy cows. It was hypothesized that increased severity of lameness would correspond to a decrease in milk yield. A field study was conducted on two commercial dairy farms in central-southern Minnesota. Biweekly visual locomotion scoring (VLS) was conducted across all lactating pens. A total of 2,226 cows were assessed using a standardized 4-point VLS system, where 0 represented sound locomotion and 3 indicated severe lameness. A linear regression model was created using a 7-d rolling milk yield average from farm records and the cow's VLS, with lactation (1, 2, 3+), breed, and days in milk included in the model to account for confounding. Preliminary analysis revealed a negative relationship between VLS and milk yield. Cows with VLS of 0 (n=366) had higher milk (38.4 kg/d; 95%CI: 37.0, 39.9) compared to VLS 1 (n=1189) (37.0 kg/d; 95%CI: 36.0, 38.0), 2 (n=615) (36.6 kg/d; 95%CI: 35.3, 37.8) and 3 (n=43) (35.2 kg/d; 95%CI: 31.4, 39.0). This supports the hypothesis that lameness severity is inversely related to milk yield. Limitations of this work include only a snapshot of the cow's milk production and lameness status. These findings highlight the potential impact VLS has on milk production and the importance of cows remaining sound, to sustain productivity and ensure animal welfare.

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Precision Diagnostics: Serovar-Specific Marker Identification in *Glaesserella parasuis* Marker Identification via Pangenome Profiling

Jennifer Le Grand, Emmanuel Kuufire, Kingsley Bentum, Woubit Abebe
College of Veterinary Medicine, Tuskegee University, Tuskegee, Alabama

Glaesserella parasuis (*G. parasuis*) is a commensal bacterium of the porcine upper respiratory tract and an opportunistic pathogen responsible for Glässer's disease, which primarily affects young pigs and causes major economic losses worldwide. The disease is characterized by polyserositis, polyarthritis, and pneumonia. Because of its fastidious growth requirements, traditional culture-based diagnostics are labor-intensive and slow, underscoring the need for rapid molecular detection methods. A comprehensive understanding of genomic diversity and virulence factors across the 15 recognized serovars is essential for developing novel diagnostics. In this study, we employed a pangenomic approach to analyze 46 *G. parasuis* genomes retrieved from NCBI. Genome quality was assessed using CheckM, and serotype classification identified serotypes 4, 5, and 7 as the most prevalent. Pangenome analysis with the Roary ILP pipeline revealed serovar-specific genes, while core genome analysis across identity thresholds identified 1,199 to 1,144 conserved genes at 65% to 95%, respectively, including 168 hypothetical proteins at the 95% threshold. Notably, key virulence- and fitness-associated genes were detected, including *arnC_2*, *cdtB_1*, and *mshA*. Certain hypothetical proteins were uniquely associated with serotypes 5 and 11, while *epsE_1*—a glycosyltransferase involved in exopolysaccharide biosynthesis—was specific to serotype 7.

The minimal cross-reactivity observed among these targets highlights their potential utility in serotype-specific molecular diagnostics. These findings provide a foundation for the development of precise molecular assays and offer novel insights into the role of previously uncharacterized proteins, with implications for improved diagnostics, vaccine development, and disease control strategies in swine populations.

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The Use of Traditional Fecal Diagnostics Versus Fecal PCR to Detect Intestinal Parasites

Zahra McIntosh, Trenecka Collins, Rawah Faraj, Athema Etzioni

Department of Pathobiology, Tuskegee University, College of Veterinary Medicine Tuskegee, Alabama

Trichostrongylus spp. are gastrointestinal nematodes that significantly threaten the health and productivity of ruminants, especially in organic beef cattle, where anthelmintic use is limited. This study aimed to compare the effectiveness and diagnostic accuracy of the traditional method (fecal egg count) with polymerase chain reaction (PCR) for detecting *Trichostrongylus* spp. in fecal samples from organic beef cattle. A total of 9 fecal samples were collected from cattle raised in certified organic systems. All samples were initially examined using direct smear, fecal float, egg per gram (McMaster), followed by molecular identification targeting the cytochrome oxidase subunit 1 (COX1) gene. Results showed that while traditional fecal egg counts detected *Trichostrongylus* ova in 3 of the samples, PCR analysis identified parasite DNA in 2 samples. The molecular method also enabled accurate species-level identification, which is not possible with conventional microscopy. These findings highlight the limitations of traditional diagnostic methods and emphasize the importance of incorporating molecular diagnostics like PCR to improve parasite monitoring and control in organic livestock systems.

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Characterization of Antimicrobial Resistance in *Escherichia Coli* Isolated from Central Alabama Freshwaters

Nautica Merrell¹, Faith Kadzviti¹, Yesutor K. Soku¹, Vaughan Mountain², Abdelrahman Mohamed¹

¹Department of Pathobiology, College of Veterinary Medicine, Tuskegee University, Tuskegee, AL, ²Department of Biological Sciences, School of Arts and Sciences, Oakwood University, Huntsville, Alabama, (Mountain)

Freshwater systems in Alabama are vital resources for both recreation and agriculture, yet their microbial safety remains under-monitored. In this study, we characterized the antimicrobial resistance (AMR) profile of *Escherichia coli* from surface water samples collected from publicly accessible freshwater sources across six counties in Alabama, USA. We surveyed 50 freshwater sites across Autauga, Chambers, Elmore, Lee, Macon, and Montgomery counties in Alabama and isolated non-pathogenic *E. coli* from 12 locations (24%) using the Biolog GEN III Microplate platform. Phenotypic profiling by Kirby–Bauer disc diffusion revealed universal resistance to ampicillin (12/12), with 25% resistance to tetracycline (3/12), 25% to gentamicin (3/12), and 8% to sulfamethoxazole/trimethoprim (1/12). Among *E. coli* isolates, single-drug resistance predominated (8/12), double-drug resistance was observed in 2/12, and multidrug resistance (≥ 3 classes) in 2/12. Whole-genome sequencing identified β -lactamase genes in 6/12 isolates and resistance determinants for cephalosporins, aminoglycosides, and tetracyclines each in 5/12. Genotype–phenotype concordance was complete for ampicillin (6 genes positive isolates all resistant) but lower for gentamicin (1:3). Numerous virulence genes related to adhesion (*fimA*, *faeC*), biofilm formation (*csgB*, *csgG*), quorum sensing (*lasI*, *pchB*), iron acquisition (*entA*), secretion systems (*gspC*, *gspD*), and motility (*flgB*, *fliG*) were also detected. The presence of both genotypic and phenotypic resistance, along with virulence genes in *E. coli* from publicly accessible freshwater sources, highlights the urgent need for systematic environmental surveillance of antimicrobial resistance.

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Factors Affecting Prevalence and Load of Varroa Mite in Apiaries in Macon County

Candace Moore, Gemechu Wirtu

Department of Biomedical Sciences, College of Veterinary Medicine, Tuskegee University

The ectoparasitic mite *Varroa destructor*, originally parasitizing the Asian honeybee (*Apis cerana*), has emerged as a global threat to apiculture following its host shift to the European honeybee (*Apis mellifera*). Reproduction typically occurs in drone brood cells, which are large and have longer capping stages, allowing more time for mite reproduction. Besides feeding on the larvae, pupae and adult bees, varroa mites transmit virus particles directly into the bees leading to immunosuppression and other disorders. Despite the implementation of numerous control strategies, the interplay

between the mite and environmental or biological variables continues to jeopardize colony viability and apicultural productivity. The objective of the present study was to determine the prevalence and some factors affecting the parasitic load of varroa in Macon County, Alabama. Varroa infestation was assessed using the alcohol wash method during the months of May, June and July. Approximately 300 bees were sampled from brood nests, placed in 125 mL of 70% isopropyl alcohol, and shaken to dislodge mites for counting. A total of 19 hives were examined in three bee yards. The overall prevalence was 93.7% (15 of 16 hives examined), with a parasite load ranging from 0.003 to 0.03 mites per bee (0.3 to 3%). The proportion of hives with mite loads between 0 and 1% and between 1 and 3% was 33% and 67%, respectively. The results confirm a high prevalence of varroa mites in the county. There is a need for ongoing surveillance and evidence-based mite management strategies. There was a tendency for higher parasite load in hives with a large population of bees.

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Potential of Natural and Designed Cyclic Peptides as a Source of Antiviral Drugs Using the Influenza A Virus Model

Hilarie Uwamahoro¹, Willard E. Collier¹, Jesse M. Jaynes¹, Toufic O. Nashar², Rawah Faraj², Desmond G. Mortley³, and Cheryl G. Davis⁴

¹Dept. of Chemistry, College of Arts and Sciences, ²Dept. of Pathobiology, College of Veterinary Medicine, ³Dept. of Agricultural and Environmental Sciences, College of Agriculture, Environment & Nutrition Sciences, Tuskegee University, Tuskegee, and ⁴Health Sciences, Trenholm State Community College, Montgomery, Alabama

The rapid mutation rate of influenza A viruses, including H1N1 and H5N1, and the emergence of drug-resistant strains highlight the urgent need for new, safe, and effective antivirals. Cyclic peptides, characterized by high stability, enzymatic resistance, and target specificity, are promising candidates. This research focuses on identifying antiviral cyclic peptides from the seeds of *Cannabis sativa* L. Bialobrzeskie (hemp), *Hibiscus sabdariffa* L. Rhico Red (hibiscus), and *Abelmoschus esculentus* L. Clemson Spineless (okra), as well as designing cyclic peptides using molecular modeling tools. Seeds were grown at Tuskegee University, and their protein content was determined using the Kjeldahl method, with hemp, hibiscus, and okra showing values of 513 mg/g, 373 mg/g, and 377 mg/g, respectively. Protein isolates of each seed were obtained, and their protein concentrations were measured using a NanoDrop spectrometer, yielding 999.99 mg/g for hemp, 652.75 mg/g for hibiscus, and 999.80 mg/g for okra. Preliminary sodium dodecyl sulfate-polyacrylamide gel electrophoresis revealed protein bands ranging from 48 kDa to 10 kDa, and evidence of small proteins under 10 kDa. Cyclic peptides are being purified using size exclusion chromatography. Liquid chromatography-mass spectrometry identified cyclic proteins and peptides in hemp. Additionally, two cyclic peptides, one with eight and another with ten amino acids, have been designed using Chimera, ClusPro, and PyMOL, and both have shown a high binding affinity with the H1N1 fusion domain through hydrogen bonding and van der Waals interactions. This research has the potential to advance the development of antiviral drugs and support global efforts against viral infections.

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The Role of UL47 Nuclear Export Signal in Marek's Disease Virus Pathogenesis in Chickens

Glorianna Wright, Hafiz Sohaib Zafar, Keith Jarosinski

The poultry industry has seen intensification of Marek's disease virus (MDV) and it does not seem to be halting its growth anytime soon. MDV enters the chicken through the respiratory tract and causes lymphocytic tumors and paralysis. While homologous avian herpesvirus vaccines have been used to reduce the effects of MDV, there is no substance that rids the virus from the environment or the bird completely. MDV matures only in the feather follicle epithelial cells (FFE) of chicken and studies showed that UL47 is essential for the virus to transmit between individuals. UL47 is also believed to transport mRNAs of the virus from the nucleus to the cytoplasm via the nuclear export signal (NES) of the FFEs. So, what would happen if the UL47 NES was removed? To examine this, we deleted amino acids 418-432 of UL47 in MDV and tested it in chickens. Chickens (n =10) were inoculated with wildtype,

UL47-null, and UL47_NES-null, and replication was monitored over 10 weeks. Another group of uninfected contact chickens (n=10) was housed with each virus to test transmission. After induction of MD in chickens, tumors were collected and used to produce Marek's disease chicken cell lines (MDCCs) for further studies. Following the completion of this study, we will gain a better understanding of how UL47, specifically when it is unable to translocate, affects replication, oncogenicity, and transmission in chickens. This information will help address future viral genes to target in vaccines or therapies for Marek's disease.

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