

22nd Annual One Health Symposium Ninth Annual Phi Zeta Research Day

*Theme: One Health: Transcending
Institutional and Disciplinary Boundaries*



VIRTUAL
October 18 - 19, 2021

**College of Veterinary Medicine
Tuskegee University**



TUSKEGEE UNIVERSITY

OFFICE OF THE PRESIDENT



Greetings,

I am pleased to welcome you to the Tuskegee University College of Veterinary Medicine's 22nd Annual One Health Symposium. This year's theme, "One Health: Transcending Institutional and Disciplinary Boundaries," coincides with my vision of "One Tuskegee" as we chart a path towards a new normal due to the impact of the COVID-19 pandemic.

As the institutional home for the only college of veterinary medicine within a historically black college or university, we are extremely proud of the legacy and diversity of the college established to meet the demand for black veterinary medical professionals. We are extending its reach into public health with the establishment of the Department of Graduate Public Health in 2017 poised the university to be prepared to respond to the pandemic to mitigate the spread of COVID19 on our campus and in the communities that we serve.

The one health interface of the human-animal-environment demonstrates the synergies created when we build transdisciplinary teams to address complex overlapping challenges such as an infectious disease pandemic, social injustices, and food scarcity. Transcending institutional and disciplinary boundaries is even more critical in resource-poor regions of the world, such as the black belt counties in Alabama. I am confident that the information shared during this year's symposium will help build on the body of knowledge to increase health equity for black and other people of color.

I look forward to greeting you in person during the symposium and learning from the outcomes that will flow from this annual opportunity for collaboration and communication with our local, state, and federal partners.

Best wishes for an enlightening conference.

Sincerely,

Charlotte P. Morris, Ph.D.
President



TUSKEGEE

UNIVERSITY

COLLEGE OF VETERINARY MEDICINE

Office of the Dean



Welcome to the 22nd Annual One Health Symposium (formerly the Biomedical Research Symposium) held on October 18, 2021, and the 9th Annual Phi Zeta Research Day held on October 19, 2021. Although both venues are held virtually due to the coronavirus pandemic, a forum of thought leaders will launch another successful event. The Symposium's theme, ***"One Health: Transcending Institutional and Disciplinary Boundaries,"*** acknowledges the continuous focus on the One Health Triad on healthy people, healthy environments, and healthy animals that aligns with the work of biomedical leaders in shaping the future directions in advancing healthcare and biomedical research.

The annual symposium underscores our commitment to the overall strategy of providing a forum for advancing biomedical research and to heighten awareness of global health disparities. Health disparities in our country is an ongoing problem in various populations with limited access to healthcare, special needs, and inequalities associated with economic factors, environmental and social hazards, and other disparities across different racial ethnic and socioeconomic groups. Participants will have the opportunity to hear from dynamic speakers, engaged faculty and motivated students across colleges and disciplines engaged in efforts to reduce health disparities and eventually reach the goal of eliminating them.

This symposium will not only be a forum for research collaboration, but also allow participants to learn about the exciting new interventions in biomedical research. The Phi Zeta Research Day session will highlight student contributions in research as an opportunity for them to share their research experiences with oral and poster presentation. We salute all the outstanding scientists and students making presentations.

I extend my appreciation to the One Health Symposium Co-chairs, Attorney Crystal James, Graduate Public Health Department Head, and Dr. Toufic Nashar, Associate Professor in the Department of Pathobiology, and Dr. Ida Phillips, Assistant Professor in the Department of Pathobiology for serving as Chair of the Phi Zeta Research Day.

Together as a community of researchers, educators, and supporters, we can make a difference with advancing biomedical research with interdisciplinary approaches to enhance the healthcare of our nation. This annual event serves as another forum to promote and foster this mission. Thank you for attending and participating in the 2021 One Health Symposium and Phi Zeta Research Day.

Sincerely,

R. L. Perry, DVM, PhD, Diplomate-ACVR
Dean & Professor of Veterinary Radiology

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COLLEGE OF VETERINARY MEDICINE



We welcome you to the Tuskegee University, College of Veterinary Medicine, 22nd Annual One Health Symposium and Ninth Annual Phi Zeta research day. Our theme this year is *One Health: Transcending Institutional and Disciplinary Boundaries*. This symposium is a vivid example of how our community comes together to focus on the health of people, animals and the environment. We have excellent speakers who promote transdisciplinary approaches to one health.



We are privileged to have the CDC Director, Dr. Rochelle P. Walensky, who is an influential scholar whose pioneering research has helped advance the national and global response to HIV/AIDS. Dr. Casey Barton Behravesh, is the Director of CDC's One Health Office in the National Center for Emerging and Zoonotic Infectious Diseases and a Captain in the United States Public Health Service. Special thanks to our participant panelists from State of Alabama, Dr. Scott Harris, State Health Officer, and Dr. Tony Frazier, State Veterinarian, Director Animal Industries. We also extend our warm welcome to Dr. Margaret L. Khaitisa, Professor of Veterinary Epidemiology with an international focus at Mississippi State University. We are excited to announce that the Fourth Annual Dr. Kenneth Olden lecture will be given by Dr. Graeme Lockaby, Director, Center for Environmental Studies at the Urban-Rural Interface (CESURI) and Clinton McClure Professor of Forestry, School of Forestry and Wildlife Sciences, at Auburn University.

Our afternoon session will begin with a town hall fashioned conversation focused on bioethics and vaccinations moderated by our very own Dr. Ruben Warren, Director, National Center for Bioethics in Research and Healthcare. Our day will culminate with student presentations focused on the topic of health equity. We are so very honored that you have chosen to spend the day with us exploring strategies for more communication and collaboration to enhance population health outcomes from rural spaces to urban centers around the globe.

Best Regards,

Crystal James, JD, MPH
Chair, One Health Symposium

Toufic Nashar, DVM, Ph.D.
Co-Chair, One Health Symposium

1200 West Montgomery Road | Williams-Bowie Hall | Tuskegee, Alabama 36088
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COLLEGE OF VETERINARY MEDICINE



Welcome to the Ninth Annual Phi Zeta Research Day at Tuskegee University College of Veterinary Medicine (TUCVM). The aim of Phi Zeta Research Day aligns with the mission of the Phi Zeta Honor Society, which promotes scholarship and research pertaining to the welfare and diseases of animals. The Phi Zeta Research Day brings together veterinary and graduate student researchers to share their research findings with the scientific community and future colleagues.

We also invite researchers whose work addresses current topics in veterinary medicine. This year's keynote speaker navigates both the world of clinical veterinary medicine and the world of research. Dr. Yuri Lawrence's groundbreaking research aids in the diagnosis of dogs with liver disease by evaluating novel non-invasive markers. His perspective and viewpoints will be invaluable for future veterinarians as they consider careers as clinical researchers.

My hope is that everyone who attends this forum will enjoy and learn from the quality presentations. I also hope that participants will apply the gained knowledge in the profession and continue to support future research in veterinary medicine.

This event would not be possible or successful without the continued support of our dean of the college, Dr. Ruby Perry. The Phi Zeta Research Day committee members had an abundance of patience, guidance, and wisdom throughout the entire planning process. I would also like to thank the judges for their time in evaluating the student participants. Finally, I want to express my gratitude for the sponsors of the Ninth Annual Phi Zeta Research Day for their generosity and support of the efforts of the students at the College of Veterinary Medicine.

Best Regards,

Ida L. Phillips, DVM, Ph.D., DACVP
Chair, Phi Zeta Research Day

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22nd Annual One Health Symposium

Theme: “**One Health: Transcending Institutional and Disciplinary Boundaries**”

Tuskegee University, College of Veterinary Medicine

Virtual – October 18, 2021 (8:30 a.m. – 4:00 p.m.)

8:30 - 8:45 a.m.	- Greetings: Charlotte Morris, Ph.D., President, Tuskegee University - Welcome: Ruby L. Perry, DVM, MS, Ph.D., Diplomate-ACVR, Dean, College of Veterinary Medicine, Tuskegee University
8:45 - 8:59 a.m.	Occasion: Chair, Crystal M. James, JD, MPH, Head Graduate Public Health, College of Veterinary Medicine, Tuskegee University
9:00 - 10:45 a.m.	- Introduction of Panel: Co-Chair, Toufic Nashar, DVM, Ph.D., Associate Professor, Virology and Immunology, Department of Pathobiology, College of Veterinary Medicine, Tuskegee University Topic: <i>One Health Approach to Emergency Response</i> - Greetings and Introduction of Keynote Speaker: Rochelle P. Walensky, MD, MPH, 19th Director, Centers for Disease Control and Prevention - Keynote Speaker/Moderator: Casey Barton Behravesh, MS, DVM, DrPH, DACVPM, Director, Centers for Disease Control One Health Office in Emerging and Zoonotic Infectious Diseases Panel Discussion: - Margaret L. Khaitisa, BVM, MS, Ph.D, Diplomate-ACVPM, Professor of Epidemiology, College of Veterinary Medicine, Mississippi State University - Tony Frazier, DVM, State Veterinarian, Director Animal Industries, Alabama Department of Agriculture and Industries - Scott Harris, MD, MPH, FACP, FIDSA, State Health Officer, Alabama Department of Public Health
10:45 - 11:30 a.m.	LUNCH BREAK
11:30 a.m. - 12:15 p.m.	Public Health Rural Health Lecture Series: Fourth Annual Dr. Kenneth Olden Lecture Keynote Speaker: Graeme Lockaby, MS, Ph.D. Director, Center for Environmental Studies at the Urban-Rural Interface (CESURI) and Clinton McClure Professor of Forestry, School of Forestry and Wildlife Sciences, Auburn University
12:15 - 1:00 p.m.	BREAK
1:00 - 2:15 p.m.	Topic: <i>Ethical Issues and Vaccinations</i> Panel Discussion: - Rueben Warren, DDS, MPH, DrPH, M.DIV., Director, National Center for Bioethics in Research and Healthcare, Tuskegee University T. S. Harvey, Ph.D., Associate Professor, Medical & Linguistic Anthropology, Department of Anthropology, Center for Latin American Studies, Vanderbilt University
2:15 - 2:30 p.m.	BREAK
2:30 - 4:00 p.m.	- Introduction of Student Panel: Benjamin Adu-Addai, DVM, Ph.D., Assistant Professor, Microanatomy and Pathology, Department of Biomedical Sciences, College of Veterinary Medicine, Tuskegee University Topic: <i>Health Equity</i> - Ashunti Johnson, Public Health MPH Student, College of Veterinary Medicine, Tuskegee University <i>Significance of One Health in Food Security</i> - Kingsley Bentum, Interdisciplinary Pathobiology Ph.D. Student, College of Veterinary Medicine, Tuskegee University <i>Comparative Molecular Phylogeny of Coronaviruses and Cellular Receptors among Domestic and Close-contact Animals</i> - DeQuarius A. King, Interdisciplinary Pathobiology Ph.D. Student, College of Veterinary Medicine, Tuskegee University <i>Obesity Induces Key Immune Suppressive Signatures in Basal like Breast Cancer Patients and Cell Lines</i> - Elizabeth A. Bradley, Graduate Research Assistant, Ph.D. Student, Earth System Sciences, School of Forestry and Wildlife Sciences, Auburn University <i>Wild Pigs: An Emerging One Health Concern</i>

Ninth Annual Phi Zeta Research Day

Tuskegee University, College of Veterinary Medicine

Virtual – October 19, 2021 (8:30 a.m. – 1:00 p.m.)

8:30 - 8:35 a.m.	Welcome: Ruby L. Perry, DVM, MS, Ph.D., Diplomate-ACVR, Dean, College of Veterinary Medicine, Tuskegee University
8:35 - 8:45 a.m.	Occasion: Chair, Ida Phillips, DVM, Ph.D., DACVP, Assistant Professor, Anatomic Pathology, Department of Pathobiology, College of Veterinary Medicine, Tuskegee University
8:45 - 9:45 a.m.	Keynote Speaker: Yuri A. Lawrence, DVM, Ph.D., MS, MA, Dipl. ACVIM (SAIM), Internal Medicine Specialist, Lawrence Internal Medicine Consulting Services, PLLC <i>The Evaluation of Novel Non-invasive Markers of Liver Disease in Dogs</i>
9:45 - 10:00 a.m.	BREAK
	Introduction of Student Presenters: Chair, Ida Phillips, DVM, Ph.D., DACVP, Assistant Professor, Anatomic Pathology, Department of Pathobiology, College of Veterinary Medicine, Tuskegee University
10:00 - 10:15 a.m.	Kingsley Bentum, Interdisciplinary Pathobiology Ph.D. Student, College of Veterinary Medicine, Tuskegee University <i>Sub-genome Analysis of Feline Infectious Peritonitis (FIP) Virus and Closely Related Alphacoronaviruses Supports Recombination Hypothesis</i>
10:15 - 10:30 a.m.	Andrey L. Bryson, Second Year Veterinary Student, College of Veterinary Medicine, Tuskegee University <i>Enterotoxins Disrupt Immune Cells communication by their Effects on Extracellular Vesicles</i>
10:30 - 10:45 a.m.	Pauline Hunter, Second Year Veterinary Student, College of Veterinary Medicine, Tuskegee University <i>Prevalence and Persistence of Intestinal Helminths in Shelter Dogs</i>
10:45 - 11:00 a.m.	Courtney Moore, Third Year Veterinary Student, College of Veterinary Medicine, Tuskegee University <i>Use of a Deep Learning Artificial Intelligence Model for Differentiating Alveolar and Bronchiolar Adenomas and Carcinomas of the Lung in B6C3F1 Mice</i>
11:00 - 11:15 a.m.	Chloe Rogers, Second Year Veterinary Student, College of Veterinary Medicine, Tuskegee University <i>Detection and Characterization of Edwardsiella Tarda Isolates from Natural Lakes and Waters in Alabama</i>
11:15 - 11:30 a.m.	Bryanna G. Snipes, Third Year Veterinary Student, College of Veterinary Medicine, Tuskegee University <i>Determining the Correlation between Blood Glucose, Saliva Glucose, and Saliva pH levels in Small and Large Animal Patients</i>
11:30 - 11:45 a.m.	BREAK
11:45 a.m. - 1:00 p.m.	POSTER SESSION - Zoom Breakout Rooms
	Poster Presenters: - Laurielle Gibson, Second Year Veterinary Student, College of Veterinary Medicine, Tuskegee University <i>Differential Gene Expression Analysis of Newborn Mouse Kidneys Lacking Prkaca (PKAcα)</i> - Pauline Hunter, Second Year Veterinary Student, College of Veterinary Medicine, Tuskegee University <i>Prevalence of Intestinal Helminths in Dogs and Cats and History of Anthelmintic and Preventive Products Usage</i> - Sierra Johnson, Third Year Veterinary Student, College of Veterinary Medicine, Tuskegee University <i>Antibiotic Resistance Profiles of Staphylococcus spp. Isolated from Food Matrices</i> - Sanchez Rolle, Integrative Biosciences Ph.D./Graduate Public Health MPH Student, College of Agriculture, Environment Nutrition Sciences, College of Veterinary Medicine, Tuskegee University <i>Effect of Different Concentrations of Serum on the Maturation of Bovine Oocytes</i> - Serena Stoddard, Third Year Veterinary Student, College of Veterinary Medicine, Tuskegee University <i>Factors Affecting Vittrification of Canine Epididymal Spermatozoa</i> - Bryanna G. Snipes, Third Year Veterinary Student, College of Veterinary Medicine, Tuskegee University <i>Evaluation of Clinical Signs in Small and Large Animal Patients Presenting with Abnormal Blood Glucose Levels</i>
12:30 - 12:45 p.m.	BREAK
12:45 - 1:00 p.m.	Awards Ceremony

One Health Symposium Speaker

Rochelle P. Walensky, MD, MPH

19th Director, Centers for Disease Control and Prevention



Rochelle P. Walensky, MD, MPH, is the 19th Director of the Centers for Disease Control and Prevention and the ninth Administrator of the Agency for Toxic Substances and Disease Registry. She is an influential scholar whose pioneering research has helped advance the national and global response to HIV/AIDS. Walensky is also a well-respected expert on the value of testing and treatment of deadly viruses.

Walensky served as Chief of the Division of Infectious Diseases at Massachusetts General Hospital from 2017-2020 and Professor of Medicine at Harvard Medical School from 2012-2020. She served on the frontline of the COVID-19 pandemic and conducted research on vaccine delivery and strategies to reach underserved communities.

Walensky is recognized internationally for her work to improve HIV screening and care in South Africa and nationally recognized for motivating health policy and informing clinical trial design and evaluation in a variety of settings.

She is a past Chair of the Office of AIDS Research Advisory Council at the National Institutes of Health, Chair-elect of the HIV Medical Association, and previously served as an advisor to both the World Health Organization and the Joint United Nations Programme on HIV/AIDS.

Originally from Maryland, Walensky received her Bachelor of Arts from Washington University in St. Louis, her Doctor of Medicine from the Johns Hopkins School of Medicine, and her Masters in Public Health from the Harvard School of Public Health.

One Health Symposium Keynote Speaker

Casey Barton Behravesh, MS, DVM, DrPH, DACVPM

Director, Centers for Disease Control One Health Office in Emerging
and Zoonotic Infectious Diseases



Casey Barton Behravesh, is the Director of CDC's One Health Office in the National Center for Emerging and Zoonotic Infectious Diseases and a Captain in the United States Public Health Service. She serves as the agency's lead for implementing a multisectoral, One Health approach to public health that connects human, animal, and environmental health, enabling CDC and partners to address emerging zoonotic and infectious diseases and other shared health threats at the human-animal-environment interface. Barton Behravesh is experienced in bringing together human, animal, and environmental health officials at the local, state, federal, and global levels to bridge gaps related to emerging zoonotic and infectious diseases.

During her extensive career at CDC, Barton Behravesh has done everything from investigating outbreaks in the field to conducting epidemiologic research related to the prevention and control of zoonotic, foodborne, and vector-borne diseases. She also serves as the head of the Collaborating Centre for Emerging and Re-emerging Zoonotic Diseases for the World Organization for Animal Health (OIE). In her leadership role at CDC, she enjoys mentoring students and new staff to help them reach their career goals.

Barton Behravesh has a Master of Science degree in Veterinary Parasitology from Texas A&M University. She received her Doctor of Veterinary Medicine degree from Texas A&M University College of Veterinary Medicine and a Doctor of Public Health degree from the University of Texas Health Science Center at Houston School of Public Health. She also trained as CDC Epidemic Intelligence Service (EIS) officer. She is a diplomate of the American College of Veterinary Preventive Medicine, and has been the recipient of numerous awards, including CDC's James H. Steele Award for outstanding work on veterinary public health and One Health issues.

One Health Symposium Panel Discussion

Topic: One Health Approach to Emergency Response

Margaret L. Khaita, BVM, MS, Ph.D., Diplomate-ACVPM

Professor of Epidemiology, College of Veterinary Medicine,
Mississippi State University



Margaret Khaita is a Professor of Veterinary Epidemiology with an international focus, in the Department of Pathobiology and Population Medicine, College of Veterinary Medicine, Mississippi State University. She is Board certified by the American College of Veterinary Preventive Medicine and is a graduate of Makerere University, Uganda (Bachelor of Veterinary Medicine), University of Edinburgh, UK (Msc. Tropical Veterinary Medicine), The Ohio State University (Ph.D. Veterinary Preventive Medicine/Epidemiology focus).

Khaita previously served as Assistant Professor and Associate Professor, Epidemiology, at North Dakota State University. Khaita has taught Epidemiology, veterinary public health and preventive medicine, (both in Sub-Saharan Africa and North America) for over 30 years and mentored several graduate (MS and Ph.D.) students, postdoctoral researchers, and undergraduate students including minorities e.g. McNair Scholars. She is a Carnegie African Diaspora Fellowship Program, Fellow, (2014, 2017, Uganda and Tanzania) and a Fulbright Fellow (2020/2021, Kenya). Khaita participated in WHO/FAO/OIE Tripartite Technical Working Group on Review of Zoonoses Guide “Training and Workforce Development”, 2017. She is currently serving as a Member of One Health High-Level Expert Panel, a 26-member global panel advising FAO, OIE, UNEP, and WHO.

Her areas of research are infectious disease epidemiology and food safety. She has won several awards and honors including Outstanding Faculty Woman Award and President's Commission on the Status of Women Faculty Award at Mississippi State University. Khaita has also won and managed several grants including the USAID funded multi-institutional grant on “*Capacity building in Integrated Management of Transboundary Animal Diseases & Zoonoses*” in East & Central Africa (2011-2015), and USDA-FAS supported project “*Establishing and harmonizing SPS regulatory regimes across the eight Regional Economic Communities (RECs) of the African Union (AU)*” (2019-2023). Khaita has published over 77 peer reviewed papers and presented several abstracts at numerous national and international conferences.

One Health Symposium Panel Discussion

Topic: One Health Approach to Emergency Response

Tony Frazier, DVM

State Veterinarian, Director Animal Industries
Alabama Department of Agriculture and Industries



Tony Frazier was appointed State Veterinarian July 1, 2001. Frazier is a 1988 graduate of Auburn University, College of Veterinary Medicine. Post-graduation, he worked in a mixed animal practice in Cullman, Alabama. In 1990, he returned to his hometown of Brewton, AL, and opened a private practice. In 1995, Frazier accepted a position with the Alabama Department of Agriculture and Industries as a Veterinary Medical Officer.

He is a member of the Alabama Veterinary Medical Association; Southern Animal Health Association and the United States Animal Health Association. Frazier serves as advisory to the Board of

Directors of the Alabama Poultry & Egg Association, Alabama Cattlemen's Association, Alabama Beef Cattle Improvement Association, and the Beef Committee of the Alabama Farmers Federation. Within the Alabama Department of Agriculture & Industries, Frazier is responsible for the Animal Health Section, Meat Inspection Section, Diagnostic Laboratories and Poultry Programs.

Frazier has served as P.T.O. President for W. S. Neal Elementary School, Brewton, AL, and is a member of the Cornerstone Community Church, which is also located in Brewton.

Frazier and his wife of 32 years, Patty, have three children which are Nathan (wife Lauren), Madeline (husband Jacob), and Samuel.

Frazier and Patty are anxiously awaiting their first grandchild in February and a second grandchild is expected in April.

One Health Symposium Panel Discussion

Topic: One Health Approach to Emergency Response

Scott Harris, MD, MPH, FACP, FIDSA

State Health Officer
Alabama Department of Public Health



Scott Harris, MD, MPH, was appointed Acting State Health Officer for the Alabama Department of Public Health (ADPH) in September 2017 and formally designated as Alabama's 12th State Health Officer in February 2018. A graduate of Harding University in Arkansas, Harris attended medical school at the University of Alabama at Birmingham (UAB) School of Medicine and served an internal medicine internship and residency at Carraway Methodist Medical Center in Birmingham before returning to UAB to complete a fellowship in adult infectious diseases. He earned his MPH from the UAB School of Public Health.

In 1996, he began his practice in general infectious diseases and HIV medicine in Decatur, Alabama, and began serving as a tuberculosis consultant with ADPH. In 2004, he helped to establish the Decatur-Morgan Community Free Clinic, serving thirteen years as the medical director, as well as a board member and board chair. The non-profit clinic offers health care and dental care at no charge to low income, medically uninsured residents, and relies heavily on community volunteers.

As a volunteer physician, Harris has served on many international medical missions to Central America, South America, and Africa. In addition to his board certification in internal medicine and infectious disease, he has additional certificates of qualification in tropical medicine from the American Society of Tropical Medicine and Hygiene, and in travel medicine from the International Society of Travel Medicine.

Harris left private practice to join ADPH in 2015 as Area Health Officer for seven North Alabama counties, before assuming his current role as State Health Officer. He and his wife Sandy have four children and reside in Montgomery.

One Health Symposium
Public Health Rural Health Lecture Series: Fourth Annual
Dr. Kenneth Olden Lecture
Keynote Speaker

Graeme Lockaby, MS, Ph.D.

Director, Center for Environmental Studies at the Urban-Rural Interface (CESURI)
and Clinton McClure Professor of Forestry,
School of Forestry and Wildlife Sciences, Auburn University



Graeme Lockaby is a Professor in the School of Forestry and Wildlife Sciences at Auburn University. He also serves as the Clinton – McClure Endowed Professor in that School. He earned his B.S. and M.S. in Forestry at Clemson University and his PhD in Agronomy – Soils at Mississippi State University. Lockaby's program focuses mainly on the biogeochemistry of forested floodplains and relationships between wetlands and human health. In particular, his biogeochemistry studies have centered on decomposition and relationships between nutrient circulation in floodplains and net primary productivity. He has also studied the influence of altered hydrology and degraded water quality as well as forest fragmentation on the incidence of West Nile virus. Lockaby

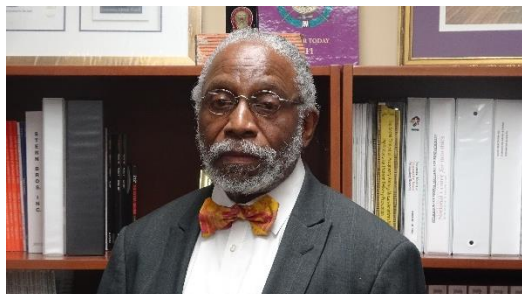
has authored or co-authored 120+ refereed journal articles and numerous abstracts and other publications. He has served as major professor for 32 graduate students and was asked to present the William Patrick Lectureship at a recent Annual Meeting of the Soil Science Society of America – Wetland Soils Division.

One Health Symposium Panel Discussion

Topic: Ethical Issues and Vaccinations

Rueben Warren, DDS, MPH, DrPH, M.DIV.

Director, National Center for Bioethics in Research and Healthcare
Tuskegee University



Rueben C. Warren is currently the Director of the National Center for Bioethics in Research and Health Care and Professor of Bioethics at Tuskegee University in Tuskegee, Alabama. He is also former Director of the Institute for Faith-Health Leadership and Adjunct Professor of Public Health, Medicine and Ethics at the Interdenominational Theological Center (ITC) in Atlanta, GA. From 1988 to 1997, Warren served as Associate Director for Minority Health at the Centers for Disease Control and Prevention (CDC). From 1997 to 2004, he was Associate Director for Urban Affairs at the Agency for Toxic Substances and Disease Registry (ATSDR). From 2005 to 2007, Warren served part-time as the Director of

Infrastructure Development for the National Center on Minority Health and Health Disparities at the National Institutes of Health in Bethesda, MD. From 2004 to 2009, he was on leave from the National Center for Environmental Health-CDC/ATSDR) in Atlanta, where he served as Associate Director for Environmental Justice. As Associate Director at CDC/ATSDR Warren had lead agency responsibility for Environmental Justice and Minority Health.

Prior to joining CDC, Dr. Warren served as Dean and Associate Professor in the School of Dentistry, Department of Preventive Dentistry and Community Health, at Meharry Medical College in Nashville, Tennessee. He is also Clinical Professor, Department of Community Health/Preventive Medicine, Morehouse School of Medicine and Adjunct Professor, Department of Behavioral Sciences and Health Education, Rollins School of Public Health, Emory University, both in Atlanta, Georgia. Warren is also Adjunct Professor in the Department of Dental Public Health, School of Dentistry and Adjunct Professor in the School of Graduate Studies and Research at Meharry Medical College in Nashville, TN and Georgia Health Sciences University in Augusta, GA.

Warren earned his undergraduate degree from San Francisco State University, his dental degree from Meharry Medical College, and both masters and doctorate degrees from the Harvard School of Public Health. He also completed a two-year residency at the Harvard School of Dental Medicine in Dental Public Health. He is board certified in Dental Public Health. Warren also completed a Master of Divinity (M. Div) from the Interdenominational Theological Center with a concentration in theology and ethics. Warren is an ordained minister. In June 1990, Warren received the Distinguished Harvard Alumni Award. In May 1999, he was awarded the Honorary Degree of Doctor of Medical Science from Meharry Medical College. In 2000, he received the President's Distinguished Service Award, Meharry Medical College. In October 2003, Warren's academic status at Meharry's dental school was elevated to Dean Emeritus. Later in October of that same year, he was inducted into the American College of Dentists. In 2009, he received a certificate through an Intensive Bioethics Course at Georgetown University, Kennedy Institute of Ethics, Washington D. C. In May 2010, Warren received the Michael C. Alfano Award from New York College of Dentistry for Promoting Diversity in Dental Education. In 2011, Warren was inducted (Honorary) into Delta Omega Public Health Honorary Society. In 2013, Dr. Warren was awarded the Honorary Doctor of Humane Letters from Meharry Medical College.

His extensive public health experience at community, state, local, national, and international levels range from clinical and research work in the Lagos University Teaching Hospital in Lagos, Nigeria, to heading the Public Health Dentistry Program at the Mississippi State Department of Health. Warren has contributed to the scientific literature in public health, oral health, ethics, and health services research. His professional associations include: the Health Braintrust of the Congressional Black Caucus of the United States, National Dental Association, American Board of Dental Public Health, American Public Health Association United Nations Children's Fund, and World Health Organization. Warren's membership in health related associations has expanded his perspective on health. In 1996-97, he served as Chairperson of the Caucus on Public Health and Faith Communities, an affiliate of the American Public Health Association.

One Health Symposium Panel Discussion

Topic: Ethical Issues and Vaccinations

T. S. Harvey, Ph.D.

Associate Professor, Medical & Linguistic Anthropology, Department of Anthropology, Center for Latin American Studies, Vanderbilt University



With training in medical and linguistic anthropology, T.S. Harvey's research and interests focus expanding scientific partnerships, developing innovative technologies, and building local capacities to collaboratively tackle large scale global public health and environmental challenges that emerge at the critical intersection of vulnerable populations, health disparities, disease, risk, environmental degradation, water, sanitation, and infrastructure. The evolution of this trans-disciplinary approach is the product of over a decade of funded collaborative research, capacity-building work, and global engagement on a wide range of topics that include but are not limited to: cross-cultural doctor-patient communication, language and culture in global public health, waterborne diseases, enteric illnesses, disaster prevention and relief, neighborhood approaches to risk reduction, crisis management, sustainability, resilience, and environmental protection.

Harvey formed part of the team that created a [virtual self-screening tool](https://www.virtualcovidscreen.com) that will help individuals assess their risk of being infected with COVID-19. The app also offers capabilities for expediting test screening for providers and ultimately giving public health officials real-time anonymized data to identify, map and target interventions where they're needed most: <https://www.virtualcovidscreen.com> He also launched the Spanish version of the free Vanderbilt COVID-19 Virtual Self-Screening Tool <https://es.virtualcovidscreen.com>.

One Health Symposium Students' Panel Discussion

Topic: Health Equity

Ashunti Johnson

Graduate Public Health MPH Student
College of Veterinary Medicine, Tuskegee University



Significance of One Health in Food Security

Ashunti Johnson, and Lloyd A.W Webb,
Department of Graduate Public Health, College of Veterinary
Medicine, Tuskegee University

Food security requires contemplations in transcending institutional and disciplinary boundaries utilizing the One Health concept. This idea interfaces with the creature, human, and environment, accepting biomedical exploration revelations, general wellbeing adequacy, the logical knowledgebase, clinical training and clinical consideration.

Significant parts of food security incorporate accessibility, availability, wellbeing, steadiness, quality and the nutritious idea of food, connected to various organizations and institutions, and contrast in vital and strategy reactions in issue, for example, 'water distribution, land use designs, food exchange, postharvest handling, and food costs and safety'(<https://www.ifpri.org/topic/food-security>).

This paper considers hazard factors in food security and examines the US institutional and administrative system of the USDA, the FDA, and the CDC; symptomatic research centers; preparing offices; and assets going from rural contributions to transportation, finance, and trained workforce – food auditors, food overseers, food processors, quality control supervisors, among numerous others. Guidelines are urgent to administration of the food business and food risks from food toxins, food controllers, food added substances, and food utensils. It considers likewise institutional and disciplinary limits influenced at the international level by the Codex Alimentarius and the International Office of Epizootics requiring multi-disciplinary and multi-sectoral coordination.

Student Support: College of Veterinary Medicine, Tuskegee University

One Health Symposium Students' Panel Discussion

Topic: Health Equity

Kingsley Bentum

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



Comparative Molecular Phylogeny of Coronaviruses and Cellular Receptors among Domestic and Close-contact Animals

Kingsley Bentum^a, Sage Shaddox^a, Crystal Ware^a,
Gopal Reddy^a, Woubit Abebe^a, Raphael Folitse^b,
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The ontogeny and pathogenesis of several coronaviruses remain largely unknown. To learn the molecular relationships and intersections among the most common coronaviruses of domestic and close-contact animals, we analyzed selected coronaviruses: α (alpha), β (beta) or γ (gamma), for which mostly complete genome sequences were available. Multiple sequence alignments, pairwise distances and phylogenetic trees were built for the structural proteins, namely, Spike (S), Envelope (E), Membrane (M) and Nucleocapsid (NC) proteins, which are important for viral infection. Putative receptors and enzymes: Aminopeptidase-N (APN), Angiotensin Converting Enzyme 2 (ACE-2), Sialic Acid Synthase (SAS) and Transmembrane Serine Protease 2 (TMPRSS2) were also compared among host organisms. Results showed that, the structural proteins segregated according to their viral genera. The overall segregation pattern predicted that, the currently unclassified MERS-like Coronavirus (NC_034440.1) from *Pipistrelle Bat* is likely a β -coronavirus. Essential amino acids in E, M and NC proteins in all viral genera were well conserved. Interestingly, the unique polybasic Furin-cleavage region in SARS-CoV-2 which is missing in SARS-CoV or MERS-CoV, exists in some β -coronaviruses though in various configurations. Comparatively, critical ACE-2 receptor residues essential for SARS-CoV-2 S protein binding were conserved in pig and dolphin. The phylogeny of host enzymes and receptors were closely related with a consistency in proximity between dog, cat, and ferret. Our comparative analysis sheds light on the phylogenetic and potential functional relationships among coronaviruses and their hosts. Further studies are still needed to investigate the potential of close ontogeny causing recombination or cross infections.

Keywords: Coronavirus; coronavirus ontogeny; host receptors; comparative phylogeny, polybasic

Research Support: Health and Human Services HHS/HRSA #D34HP00001, and National Institutes of Health grants (#U54CA118623, SRE #T35OD010432, TU-CBR/RCMI #U54MD007585 shared resources core facility)

One Health Symposium Students' Panel Discussion

Topic: Health Equity

DeQuarius A. King

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



Obesity Induces Key Immune Suppressive Signatures in Basal like Breast Cancer Patients and Cell Lines

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Triple negative breast cancer (TNBC) cases are significantly higher amongst African American women. Also, obesity has gained attention for its role in cancer progression and prognosis. It has been well established that interactions between breast cancer cells and the surrounding stroma play major roles in breast cancer progression, metastatic potential, determination of metastasis location and clinical outcome. Among the different components of the breast cancer microenvironment are adipocytes, which are mainly composed of differentiated adipocytes and adipose progenitors. Specifically, cytokines, chemokines and possibly adipokines in the tumor microenvironment play a very important role in immune recognitions and evasion. The role of obesity in tumor progression has become a key topic in clinical studies, but still mechanistically understood.

Gene expression analysis has become a notable preclinical trial approach in recent years. The present study investigates the differential gene expression exerted by adipose conditioned media on novel triple negative breast cancer cell lines MDA MB 231 and MDA MB 468. These cell lines were selected based on their ethnic orientation to show changes in gene expression induced by adipocyte conditioned media treatment. RNA-sequencing on ACM treated MDA MB 231 compared to MDA MB 468 was analyzed using gene sequencing enrichment analysis database. GSEA analysis was also done on obese non-tumorous breast tissue patients (GSE:33526) to show immunomodulates significantly upregulated. Obesity also influenced gene expression analysis of basal like obese patients (GSE:79858) related to immune suppression. Similarly, there were significant upregulations in gene expression of MDA MB 231 and MDA MB 468 adipocyte conditioned media samples compared to control. We showed obesity significantly upregulated immunomodulates related to immune suppression in obese non tumorous, basal like obese patients, as well as novel basal like TNBC cell lines. Our findings suggest obese patients may adopt a transcriptional programming that influences tumor associate macrophage inhibition of highly aggressive TNBC subtypes.

Research Support: NIH National Institute of Health 1 SC1 GM136521-01 (NIH/NIHMD/NCI)

One Health Symposium Students' Panel Discussion

Topic: Health Equity

Elizabeth A. Bradley

Graduate Research Assistant, Ph.D. Student, Earth System Sciences,
School of Forestry and Wildlife Sciences, Auburn University



Wild Pigs: An Emerging One Health Concern

Elizabeth Bradley and Graeme Lockaby
School of Forestry and Wildlife Sciences,
Auburn University, Auburn, Alabama

An extremely prolific invasive species, wild pigs, *Sus scrofa*, are one of the most widely distributed mammals on Earth¹. With 87% of swine pathogens recognized by the World Organization of Animal Health causing clinical disease in at least one other species, wild pigs are effective reservoirs of zoonotic disease making them significant threats to public health². Here in the United States, wild pigs reside alongside 77% of agricultural animals and 46.5% of rural US citizens². These populations are expanding rapidly and have tripled over the past 30 years³. However, research into their role as a threat to public health in the nation has not expanded at quite the same rate. Due to their prolific nature and function as ecosystem engineers, solutions to this growing public health threat will require careful consideration and a focus on One Health. Using national and international examples, this talk will cover the status of wild pigs in the US, the threat they pose as reservoirs of zoonotic disease, and potential One Health solutions.

Research Support: USDA-NRCS, USDA-APHIS

Phi Zeta Keynote Speaker

Yuri A. Lawrence, DVM, Ph.D., MS, MA, Dipl. ACVIM (SAIM)

Internal Medicine Specialist,
Lawrence Internal Medicine Consulting Services, PLLC



Yuri Lawrence completed his bachelor's degree at Middlebury College in Middlebury, Vermont. He then worked as research technician at Boston University School of Medicine before completing his M.A in Anatomy and Neurobiology in 2006. Lawrence earned his doctorate in veterinary medicine degree from Tufts University Cummings School of Veterinary Medicine in 2010 and then completed an internship in small animal medicine and surgery at North Carolina State University the following year. He completed a residency in small animal internal medicine and earned a M.S in Veterinary Science at Oregon State University in June 2014 before becoming a Diplomate of the American College of Veterinary Internal Medicine in September 2014. Lawrence received a Ph.D. in

Biomedical Sciences from Texas A&M University in 2019. His research evaluated novel non-invasive markers of liver disease in dogs. A list of his peer-reviewed publications can be viewed at: <https://orcid.org/0000-0001-9078-2293>. Lawrence values providing the highest standard of care to his patients and nurturing the human-animal bond. He shares his home with his husband, three Persian cats, and loves running and time outdoors.

Phi Zeta Oral Presenter

Kingsley Bentum

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



Sub-genome Analysis of Feline Infectious Peritonitis (FIP) Virus and Closely Related Alphacoronaviruses Supports Recombination Hypothesis

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The viral origin and the pathology of FIP has remained enigmatic for decades, leading to uncertainties in our knowledge about the disease and its management. Here, we compared the sub-genomic and major protein profiles of Feline Infectious Peritonitis (FIP) virus, Feline Enteric Coronavirus (FECoV), Canine Enteric Coronavirus (CECoV) and Transmissible Gastroenteritis (TGE) virus by utilizing reference and long-read sequences deposited in public databases and which originated from prior publications. Initially, sectional protein phylogeny, distance matrices, and discordance indices built for four viruses (FIP- NC_002306.3, FECoV - FJ938055.1, CECoV - KC175339.1) showed a segment-dependent similarity among these alphacoronaviruses. While N-terminal and C-terminal segments of the coronaviruses maintained close similarity between FIP and FECoV, or CECoV and TGE, the regions NSP11, NSP13 and Spike protein (S) of the genome exhibited a cross-over similarity between FIP and CECoV or TGE. The NSPs 11, 13 and S proteins of a total of 34 viruses were subjected to recombination analysis and from the results, we propose that, 1) the genomic regions NSP11, NSP13 and S protein may be sites of RNA recombination or template switching, and 2) FIP and related viruses may originate from intra- or inter-viral recombination leading to aberrant viruses and pathologies. Given these preliminary findings, full length sequencing of additional isolates of the viruses will be critical to fully understand the biology and pathology of these alphacoronaviruses and the potential to cross-infect domestic and companion animals.

Research Support: Health and Human Services HHS/HRSA #D34HP00001, and National Institutes of Health grants (#U54CA118623, SRE #T35OD010432, TU-CBR/RCMI #U54MD007585 shared resources core facility)

Phi Zeta Oral Presenter

Andreyia L. Bryson

Second Year Veterinary Student
College of Veterinary Medicine, Tuskegee University



Enterotoxins Disrupt Immune Cells communication by their Effects on Extracellular Vesicles

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Tuskegee University College of Veterinary Medicine,
Tuskegee, Alabama

Enterotoxigenic *Escherichia coli* (ETEC) is the cause of diarrhea in human and animals in many parts of the globe, resulting in fatalities if left untreated. ETEC secretes a heat-labile enterotoxin (LT) that binds to GM1 receptor on many cells including gut cells causing an increase in cAMP level leading to electrolyte imbalance and the resulting diarrhea. LT is also a strong immunogen. Extracellular vesicles (EV's) include micro vesicles, exosomes, and apoptotic bodies, are lipid bound particles that are naturally secreted to the extracellular space from many cells. Exosomes shuttle proteins, nucleic acid, and lipids between cells, they act as an important mode of intercellular communication. we examined effects of toxins on EVs from immune cells to clarify the role of ETEC and their toxins played in disease. LT and its non-toxic subunit LTB were incubated with A20 B cells, supernatants were collected, exosomes purified and labelled, and their transfer to recipient B cells examined. A structurally and functionally related toxin to LTB, cholera toxin B (CTB) was incubated with B cells or loaded into exosomes from dendritic cells. Transfer in exosomes to recipient B cells was examined. Unexpectedly, LT and LTB significantly reduced transfer of exosomes to recipient B cells and their overall protein content. CTB incubation with B cells, and CTB in exosomes were transferred to recipient B cells. Overall, our results demonstrate a significant inhibitory effect of LT/LTB on secretion and delivery of exosomes to recipient B cells, and CTB is transferred through exosomes. We suggest that LT interruption of cell-cell communication may help ETEC inducing diarrhea in the host before an active immune response.

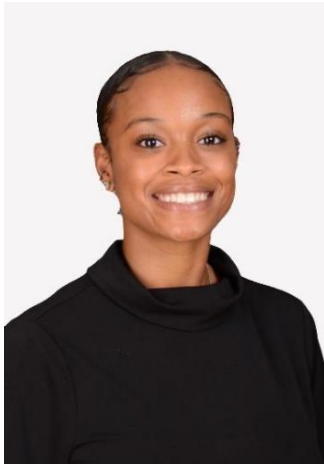
Research Support: NIH #2T35OD010432, RCMI Core facility#U54MD007585

Student Support: NIH #2T35OD010432

Phi Zeta Oral Presenter

Pauline Hunter

Second Year Veterinary Student
College of Veterinary Medicine, Tuskegee University



Prevalence and Persistence of Intestinal Helminths in Shelter Dogs

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A veterinarian is responsible for identifying, diagnosing, and treating intestinal helminths, or worm-like parasites, in pets. In the United States, the most common of these parasites found in dogs are *Ancylostoma caninum* (hookworms), *Trichuris vulpis* (whipworms), and *Toxocara canis* (roundworms). Of the three, hookworms and roundworms are zoonotic, and pose the greatest threat to the public health. Hookworms, especially, are reported to be creating an emerging dilemma due to the ability to be resistant to various drugs being used to treat the parasites. The purpose of this study was to investigate the prevalence and persistence of these three intestinal helminths in dogs at a local shelter. Fecal flotation was repeatedly performed with ½ teaspoon of naturally defecated stool samples from 44 dogs at the shelter, and the history of their preventive and anthelmintic use was obtained. Fecal results were documented for each intestinal helminth and the severity of infection was categorized as ova counts per slide <25, 25-100 and >100. On the initial fecal tests, 24/44 dogs were positive with roundworms (8), hookworms (18), and whipworms (8) including some with concurrent infection of multiple helminths. Although positive rates of the fecal test decreased as the shelter staff administered anthelmintics and monthly preventives with anthelmintic effects, one dog had persistent, mild-moderate hookworm infection throughout the study with fluctuant ova counts at 14, 35, 39 and 4. Further testing and analysis are needed to investigate if persistent cases occurred due to multi-drug resistance, leak-back and/or environmental re-infection.

Research Grant: DHHS COE Grant # D34HP00001

Student Support: DHHS COE Grant # D34HP00001

Phi Zeta Oral Presenter

Courtney Moore

Third Year Veterinary Student
College of Veterinary Medicine, Tuskegee University



Use of a Deep Learning Artificial Intelligence Model for Differentiating Alveolar and Bronchiolar Adenomas and Carcinomas of the Lung in B6C3F1 Mice

¹ Courtney Moore; ² Lindsey Smith; ³ Charan Ganta; ⁴ Dan Rudmann; ⁵ Michael Staup; ⁶ Ronald Herbert, ¹ Tuskegee University College of Veterinary Medicine, Tuskegee, AL; ² Aiforia Technologist, Cambridge Innovation Center, Cambridge MA; ³ Integrated Laboratory Systems, Morrisville, NC; ⁴ Charles River Laboratories, Broomfield, CO; ⁵ Charles River Laboratories, Durham, NC; ⁶ Comparative and Molecular Pathogenesis Branch/Division of the National Toxicology Program, NIEHS, Durham, NC

Diagnostic toxicologic pathology is rapidly transitioning to digitalization and automation. The standard is labor-intensive and time-consuming hence, there is a growing need to develop faster automated methods that would reduce costs, improve diagnostic accuracy, consistency, and workflow. Pathologists have begun using new technologies such as artificial intelligence to evaluate toxicologic pathology studies. The objective of this study was to develop and train a computer-assisted artificial intelligence system that could be used to diagnose mouse alveolar/bronchiolar adenoma and carcinoma in the lung. Once trained, the system was tested on a set of known lung tumor diagnoses to assess the accuracy of the artificial intelligence model. Using hand-drawn annotations on the digitized images, a supervised, multi-layered, convoluted neural network algorithm was created and trained to detect and recognize normal and tumor tissue, as well as the histological features or patterns that differentiate adenoma from carcinoma. The deep learning algorithm was able to identify and distinguish between background and lung tissue, normal lung from tumor, and finally adenoma versus carcinoma. These results suggest that the artificial intelligence could provide a sensitive and objective automated method to screen, detect, and diagnose proliferative lesions in lung sections. However, to increase sensitivity of the algorithm, we will need to increase the size and variability of the training data set and the number of annotations.

Student Support: Summer Internship Program at NIEHS

Phi Zeta Oral Presenter

Chloe Rogers

Second Year Veterinary Student
College of Veterinary Medicine, Tuskegee University



Detection and Characterization of *Edwardsiella Tarda* Isolates from Natural Lakes and Waters in Alabama

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College of Veterinary Medicine, Tuskegee University,
Tuskegee, Alabama

Edwardsiella tarda is a Gram-negative bacterium that infects both cultured and wild species of fish worldwide. Serious economic loss is associated with *E. tarda* due to the bacteria infecting economically important species of fish such as the Japanese eel, Japanese flounder, tilapia, and channel catfish. In the USA, commercial channel catfish farms in Alabama, Mississippi, and Louisiana have reported *E. tarda* infection within the last decade. This infection is called emphysematous putrefactive disease, which may further lead to muscular necrosis. The hypothesis of this study is, if isolates of *E. tarda* are found in natural bodies of water, then commercial fisheries that house certain species of fish (channel catfish) will most definitely be exposed to *E. tarda* due to the presence of this bacteria in water bodies. *E. tarda* is mostly masked amongst many other bacteria in natural bodies of water making isolation difficult. Therefore, different media agents of both broth and agar are utilized to in isolating *E. tarda* which is followed by various biochemical tests. Confirmation of *E. tarda* will then lead to the determination of an antibiotic susceptibility pattern for these bacterial isolates. Ultimately, the aim of this study is to identify and characterize environmental isolates of *E. tarda* and to determine the antibiotic susceptibility profile for these isolates.

Research Support: NI20AHDRXXXXG025

Phi Zeta Oral Presenter

Bryanna G. Snipes

Third Year Veterinary Student
College of Veterinary Medicine, Tuskegee University



Determining the Correlation between Blood Glucose, Saliva Glucose, and Saliva pH levels in Small and Large Animal Patients

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

Determining glucose levels in small and large animal patients currently requires venipuncture to obtain blood to use in a glucometer or to run a full panel of bloodwork. Because of this, most canine and feline diabetic patients must be routinely brought to the vet to have glucose levels checked. When it comes to equine patients, nutritional status and oral health can be assessed using glucose levels, but obtaining blood is not always practical, especially in field situations. In both small and large animal patients, salivary pH levels can be a good indicator of oral health and could correlate to the glucose levels in the saliva. The aim of this study was to determine if a correlation exists between blood and salivary glucose levels and saliva pH levels in hopes of developing an alternative, less invasive method of obtaining glucose levels in veterinary patients. Blood was drawn from patients that presented to Tuskegee University Veterinary Teaching Hospital to check glucose levels with a glucometer, a pH indicator strip was used to determine the saliva pH, and saliva was collected to be used in the glucose assay. There was no correlation determined between blood and saliva glucose levels or saliva pH levels, but factors such as hypersalivation and stress were associated with decreased and increased saliva glucose levels, respectfully. Further research in a more controlled environment could yield a correlation.

Research Support: Tuskegee Veterinary Scholars Program, RCMI Core Facility Grant #:
G12MDOO7585-23

Student Support: Boehringer Ingelheim

Phi Zeta Poster Presenter

Laurielle Gibson

Second Year Veterinary Student
College of Veterinary Medicine, Tuskegee University



Differential Gene Expression Analysis of Newborn Mouse Kidneys Lacking Prkaca (PKA α)

Laurielle Gibson, Rawah Faraj, Garfield Grimmer and Pawan Puri

Department of Biomedical Sciences, Tuskegee College of Veterinary Medicine (Gibson), Tuskegee University, Tuskegee, AL

Understanding of signaling networks regulating renal development can provide insights into the mechanisms of renal disease. Protein Kinase A (PKA) is one of the main effectors of the second messenger cAMP and regulates various cellular functions. Previous *ex vivo* studies using embryonic kidney explants showed that PKA is a key regulator of tubulogenesis and ureteric branching. However, the role of PKA in renal development *in vivo* remains undefined. We showed that in wildtype (WT) kidney, p-Creb, a well-known read out of cAMP-PKA signaling, is present in nephron progenitors and their early epithelial derivatives, however, disappears in proximal tubules (PT) suggesting a role of PKA in early nephrogenesis. Furthermore, we showed that PTs of WT embryonic explants undergo cystic dysplasia and dedifferentiation following stimulation by a cAMP analogue, 8-Br-cAMP and become p-Creb^{+ve}. Goal for this project was to understand how the lack of PKA α affects gene expression in the developing kidney. mRNA-sequencing was performed on the kidneys isolated from newborn PKA α knockout (KO) mice and wild-type littermates followed by functional enrichment by GO and KEGG analyses. 5046 were differentially expressed between the two groups. For 2797 upregulated genes, some of the top categories identified by GO and KEGG analyses were epithelial tube morphogenesis, urogenital development, covalent chromatin modification and cell matrix adhesion. For 2249 downregulated genes, some of the top categories identified were mitochondrial inner membrane protein complex, oxidative phosphorylation, ribonucleotide metabolic processes and ribosome. These results reveal PKA α -regulated cellular processes and associated genes in the developing kidney.

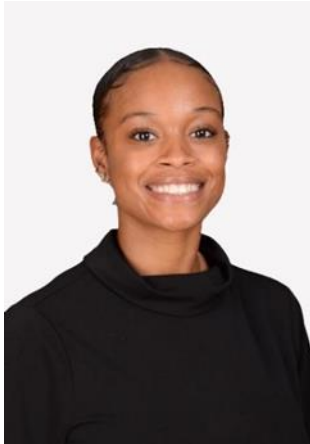
Research Support: National Institutes of Health project # 2T35OD010432, National Institute of General Medical Sciences project # 1SC2GM130475 and RCMI core facility grant # U54MD007585,

Student Support: National Institutes of Health project # 2T35OD010432

Phi Zeta Poster Presenter

Pauline Hunter

Second Year Veterinary Student
College of Veterinary Medicine, Tuskegee University



Prevalence of Intestinal Helminths in Dogs and Cats and History of Anthelmintic and Preventive Products Usage

Pauline Hunter, Noriko Aoi

Department of Small Animal Clinical Sciences, College of Veterinary Medicine, Tuskegee University, Tuskegee, Alabama

In this study, medical files of the canine and feline patients that visited Veterinary Medical Teaching Hospital at Tuskegee University (TU-VMTH) between January 2020 and June 2021 were reviewed. During this time, 519 fecal flotation tests were performed on samples from 484 patients. There were 467 canine and 52 feline samples, and ages at time of sample collection were categorized as <6 months (n=162), 6 to 18 months (n=53), 18 months to 6 years (n=166), > 6 years (n=134) and unknown (n=4). Genders were intact female (n=114), intact male (n=177), spayed female (n=118), neutered male (n=105) and litter (5). Body weight was categorized as <25 pounds (n=296), 25-50 pounds (n=88), >51 pounds (n=134), and unknown (n=1). The reason of the visits was wellness (n=458), sick (n=33), and others (n=28). No ova were found in 412 of 519 fecal samples (79.4%), while ova of *Ancylostoma*, *Trichuris vulpis*, *Toxocara* and/or other types of intestinal parasites were identified in 107 samples (20.6%). The most common anthelmintics administered was Drontal® Plus. The most common heartworm preventive with or without anthelmintic effects used in dogs prior to the visits was Advantage Multi ®. However, only 172 of 353 dogs and cats at >6 months (48.7%) had history of purchase of heartworm preventive and only 88/353(25%) had confirmed purchase of 12 months' supply prior to visits. Prevalence of intestinal helminths was discussed and compared against backgrounds and purchase history of the preventive products, months of purchase, and use of anthelmintics.

Research Grant: DHHS COE Grant # D34HP00001

Student Support: DHHS COE Grant # D34HP00001

Phi Zeta Poster Presenter

Sierra Johnson

Third Year Veterinary Student
College of Veterinary Medicine, Tuskegee University



Antibiotic Resistance Profiles of *Staphylococcus* spp. Isolated from Food Matrices

Sierra Johnson¹, Teshome Yehualaeshet²

²Department of Pathobiology, ¹College of Veterinary Medicine, Tuskegee University, Tuskegee, Alabama, 36088

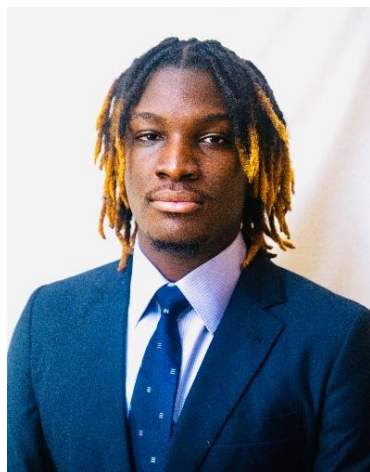
The developing resistance of *Staphylococcus* spp. to antibiotics has generated a serious public health concern globally. The purpose of this study is to perform a cross-sectional data collection and analysis of *Staphylococcus* spp. isolates from various food sample sources. Antimicrobial resistance data was collected from 35 recent sample submissions and analyzed for the species identification and antimicrobial sensitivity of each isolate. Within this experiment, we identified the genus and species of each sample and analyzed the antimicrobial resistance profile of the *Staphylococcus* species utilizing the MicroScan. From all the submitted isolates (n=35), ten *Staphylococcus* species were identified, predominately *S. hyicus* (8), *S. aureus* (6), and *S. epidermidis* (6). Based on the food samples, antibiotic resistance profile showcased Trimethoprim/Sulfamethoxazole as a particularly effective antibiotic against the most strains of *Staphylococcus* species, with Ciprofloxacin following close behind. Erythromycin was shown to be the least effective antibiotic on the panel as a large quantity of the isolates had developed some form of antibiotic resistance. Regarding the level of species, *S. hyicus* was noted as the most susceptible species to the antibiotics, while *S. sciuri* was noted as the most resistant. Appropriate actions must be taken on importance of antimicrobial stewardship, maintaining the standard operational procedures of cleaning and sanitation of processing plants and the establishments to monitor the development, and spread of antibiotic resistance in the food system. Further study will be required to keep pace with the continuously growing resistance of *Staphylococcus* species in the food chain.

Research Grant: Boehringer Ingelheim Veterinary Scholars Program (BIVSP) and Tuskegee University, College of Veterinary Medicine (Grant # HRSA #D34HP00001)

Phi Zeta Poster Presenter

Sanchez Rolle

Integrative Biosciences Ph.D./Graduate Public Health MPH Student
College of Veterinary Medicine, College of Agriculture, Environment
Nutrition Sciences, Tuskegee University



Effect of Different Concentrations of Serum on the Maturation of Bovine Oocytes

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College of Agriculture, Environment and Nutrition Sciences and
College of Veterinary Medicine, Tuskegee University

Fetal bovine serum (FBS), which is harvested from the fetus of pregnant cows at slaughter plants, is rich in components that promote cell growth. Although serum has beneficial effects on cell growth and oocyte maturation, it leads to accumulation of lipid in oocytes and embryos. Sulfosuccinimidyl oleate (SSO) is an inhibitor of cell membrane-associated fatty acid transporter (FAT) protein.

The objective of the present study was to evaluate the effects on oocyte maturation of SSO in the presence of increasing concentrations of FBS. Bovine ovaries were collected from slaughterhouses and follicles were aspirated to recover oocytes. Morphologically acceptable oocytes were subjected to in vitro maturation (IVM) in Medium 199-based media, which was supplemented with SSO and the following concentration of FBS: 0%, 10%, 15% and 20% FBS representing Treatments 1, 2, 3 and 4, respectively. After 24 hours of IVM, oocytes were denuded and stained to determine chromatin status (Hoechst). Oocyte maturation was determined by the cumulus expansion, and extrusion of the polar body. A total of 233 oocytes were used in this experiment. Cumulus expansion was greater in treatment 4 containing 20% FBS followed by treatment 3, 2 and 1 with 15%, 10% and 0% FBS respectively. Similarly, maturation was greater in treatment 4 (20% FBS) followed by treatment 3 (15% FBS), treatment 2 (10% FBS) and treatment 4 (0% FBS). Overall, it is concluded higher concentration levels of serum increased maturation of bovine oocytes.

Student Support: CAENS and IBS

Phi Zeta Poster Presenter

Serena Stoddard

Third Year Veterinary Student
College of Veterinary Medicine, Tuskegee University



Factors Affecting Vitrification of Canine Epididymal Spermatozoa

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

Vitrification is an emerging method of sperm cryopreservation that provides advantages over slow freezing, including the ability to perform the procedure with minimal equipment. Hence, there is a growing interest in understanding the factors that affect sperm survival during vitrification & devitrification. We evaluated the effects of selected cryoprotectant agents on the cooling & cryosurvival of canine epididymal spermatozoa after vitrification. Testis (n = 5 testis) were collected from the Alabama Animal Alliance & TUCVM. Semen samples were extracted from the cauda epididymis in Tris based extender (Pipan et al 2020), centrifuged, resuspended, cooled, & frozen in the following treatments: 1) Tris/sucrose (TS), 2) TS + 1mg/ml myo-inositol (MI), 3) TS + 1% poly-vinyl alcohol, 4) TS + egg yolk (TSEY), 5) TSEY + 1mg/ml MI, 6) TSEY + 0.5% glycerol, 7) TSEY + 1.5 % glycerol, & 8) TSEY+ 2.5% glycerol. After resuspension, samples were cooled to 4°C for 30 mins, & pre-freeze motility was determined using IVOSII Computer-Assisted Sperm Analysis. Samples were then vitrified by dropping 50 µL into liquid nitrogen from 11 cm & pellets were stored for >1 day. Pellets were devitrified in 200 µl of extender at 42°C. Pre-freeze and post-thaw treatment effects on percent motility were analyzed using one-way ANOVA in IBM SPSS. Treatments affected ($P \leq 0.05$) pre-freeze TPM, pre-freeze VSL, post-thaw TM, TPM and post-thaw VSL, but not pre-freeze TM. Supplementation of media with egg yolk, myo-inositol, but not low concentration glycerol, has beneficial effects on the cryosurvival of canine epididymal spermatozoa.

Student Support: Boehringer Ingelheim Scholars Program, HRSA #D34HP00001

Research Support: HRSA #D34HP00001, TU-CBR/RCMI #U54MD007585, and U54CA118623

Phi Zeta Poster Presenter

Bryanna G. Snipes

Third Year Veterinary Student
College of Veterinary Medicine, Tuskegee University



Evaluation of Clinical Signs in Small and Large Animal Patients Presenting with Abnormal Blood Glucose Levels

Bryanna G Snipes, Athema Etzioni¹, Ricardo Irizarry²,
David McKenzie³

College of Veterinary Medicine, Departments of
Pathobiology¹ and Small Animal² and Large
Animal³ Clinical Sciences, Tuskegee University, Tuskegee,
Alabama

Glucose abnormalities among small and large animal patients are characterized by hypoglycemia and hyperglycemia. Hypoglycemia occurs when the blood glucose drops below a normal range, which varies depending on the species. Hyperglycemia occurs when the blood glucose rises above the normal range. Patients suffering from hypoglycemia or severe hyperglycemia show signs of cerebral dysfunction including behavioral changes, ataxia, seizures, stupor, and in severe cases coma. These signs occur because the brain does not store glucose on its own, therefore it relies on hepatic glycogen breakdown to supply the glucose needed for normal function. However, there are numerous other etiologies for both hypoglycemia and hyperglycemia including excessive or decreased glucose utilization, glucose production, or insulin production. The aim of this study was to examine similarities and differences in the clinical presentation of patients with abnormal blood glucose levels.

Research Support: N/A

Student Support: Boehringer Ingelheim



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<https://www.elanco.com/en-us>



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