One Community
One Medicine
One Health

20TH ANNUAL
One Health Symposium
Tuskegee University
Thompkins Hall Auditorium
and
EIGHTH ANNUAL
Phi Zeta Research Day
College of Veterinary Medicine
Patterson Hall Auditorium

September 23 – 24, 2019
Dr. Lily D. McNair began her tenure as Tuskegee University's eighth president on July 1, 2018. Her appointment as Tuskegee's first female president came after a 30-year career spanning experience as a higher education educator and researcher, and in private practice as a clinical psychologist.

Before her tenure at Tuskegee, President McNair’s academic career included a variety of teaching and administrative appointments, which culminated as provost and senior vice president for academic affairs at New York’s Wagner College.

Previously, at Spelman College, an HBCU like Tuskegee, she served as associate provost of research and divisional coordinator for science and mathematics at Spelman College. At The University of Georgia, where she was an associate professor of psychology and associate director of the Clinical Psychology Doctoral Training Program, she became the Department of Psychology’s first African-American woman to obtain tenure and promotion. She has also held positions at State University of New York at New Paltz and Vassar College.

A New Jersey native and a clinical psychologist by training, President McNair holds an undergraduate degree in psychology from Princeton University, and master’s and doctoral degrees in psychology from the State University of New York at Stony Brook.

Since her appointment as president, she was named by This is Alabama and Birmingham Magazine to its 2018 class of “Women Who Shape the State” and by Diverse: Issues in Higher Education to its 2019 list of “Top 35 Women in Higher Education.” Recent Distinguished Alumni Award honors include recognition by Stony Brook University and Princeton University’s Association of Black Princeton Alumni organization.

She is married to Dr. George W. Roberts, a retired senior administrator at the U.S. Centers for Disease Control and Prevention. Together they have two adult children: Randall Roberts and Marguerite Roberts.
Welcome to the 20th Annual One Health Symposium on September 23 (formerly the Biomedical Research Symposium) and the Eighth Annual Phi Zeta Research Day on September 24, 2019. The Symposium’s theme, “One Community, One Medicine, One Health”, acknowledges the continuous focus of the One Health Triad on healthy people, healthy environments, and healthy animals that aligns with the work of biomedical leaders in shaping the future direction 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 collaborations, but also allow participants to learn about the exciting new interventions in biomedical research. The Phi Zeta Research Day sessions will highlight student contributions in research as an opportunity for them to share their research experiences with oral and poster presentations. We salute all of the outstanding scientists and students making presentations.

I extend my appreciation to the One Health Symposium and Phi Zeta Research Day Committees under the leadership of Attorney Crystal James, One Health Symposium chair and Graduate Public Health department head; Dr. Temesgen Samuel, Phi Zeta Research Day chair and professor in the Department of Pathobiology; and co-chair Dr. Gopal Reddy, interim associate dean for Research and Advanced Studies, and co-chair Dr. Shanda Bishop, assistant professor in the School of Nursing and Allied Health.

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 One Health Symposium serves as another forum to promote and foster this mission. Thank you for attending and participating in the 2019 One Health Symposium and Phi Zeta Research Day.

Sincerely,

R. L. Perry, DVM, MS, Ph.D., DACVR
Dean & Professor of Veterinary Radiology
Welcome to the 20th Annual One Health Symposium and the Eighth Annual Phi Zeta Research Day! Our theme this year is One Community, One Medicine, One Health. We have dynamic speakers, engaged faculty, and motivated students who will collaborate to bring our theme to life for this 20th symposium.

Our host is the College of Veterinary Medicine which has fostered historically the reduction of health disparities across colleges and communities for many decades.

The Second Annual Kenneth Olden Lecture will be given by Dr. Gwen Collman, Director of Extramural Research and Training, National Institute for Environmental Health Sciences. This luncheon will be held in the Tompkins Hall banquet area. It was named for the first African American Director of the National Institutes of Health and National Center for Environmental Health, Dr. Kenneth Olden. Dr. Olden, gave the inaugural lecture during last year’s symposium and gives final approval for speakers selected to give the lecture each year.

I extend a very special welcome to our community members and partners who are a part of the symposium as participants and vendors. We invite you to engage in all that we discover and share through this annual event.

Community partners such as the Tuskegee Macon County Community Foundation, Inc. has organized a vigorous civic engagement undertaking called The Movement 46 (TM 46) that plays an integral role in creating and sustaining community linkages between the University and communities who experience high rates of health disparities. They are committed to disseminating culturally correct information about the impact of discovery, intervention and prevention regarding the health and safety of communities.

During our “One Health Café” community partners, students, faculty and distinguished guests will have the opportunity for intimate one on one discussion about what questions are necessary to address accessibility, availability, and acceptability of research and services in community settings.

Lastly, I thank the other co-chairs and symposium staff for their time and efforts to ensure that we deliver a thoughtful and engaging program.

Best wishes,

Crystal M. James, JD, MPH
Head, Department Graduate Public Health
Director, Graduate Public Health Program
Associate Professor of Graduate Public Health
Welcome to the Eighth Annual Phi Zeta Research Day at Tuskegee University College of Veterinary Medicine (TUCVM). On this occasion, we bring together the TUCVM family to share research experiences and learn about current topics of research in veterinary medicine.

On Phi Zeta Research day, TUCVM students, interns and faculty will present their on- or off-campus research to the CVM community. We also invite prominent researchers whose work addresses current topics in veterinary medicine, public health and the ecology.

This year’s featured presentations include those on Host-Vector-Microbe Systems, New Castle Disease, Ticks and Pathogens, Corneconjunctival Transpositions, and Salmonella in Guniea Pigs. We hope you will enjoy and learn from the quality presentations, and you will apply the gained knowledge in your profession, and support future research in veterinary medicine.

We thank Dean Ruby Perry for her support throughout the years in our efforts to make Phi Zeta Research Day successful. We also thank all Phi Zeta Research Day committee members and judges for their crucial contributions.

Best Regards,

Temesgen Samuel, DVM, Ph.D. 
Chair, Phi Zeta Research Day

P. Gopal Reddy, DVM, Ph.D., DACVM
Co-Chair, Phi Zeta Research Day
Phi Zeta Research Day in the College of Veterinary Medicine at Tuskegee University was first established in September of 2012 and featured as a part of the annual Biomedical Research Symposium that is now known as the One Health Symposium. Phi Zeta Research Day continues as an annual scientific event since Dr. Ruby L. Perry envisioned it. Dr. Ebony Gilbreath chaired the first event. Each year, sessions are organized to highlight student contributions in research as an opportunity for them to share their research experiences with oral and poster presentations to other DVM students, undergraduate and graduate students, faculty, interns, community participants and other researchers. Students get opportunities to explore career options in research and post-graduate educational programs. In conjunction with the One Health Symposium, students also benefit from gaining knowledge on how the interconnection of healthy people, healthy environments, and healthy animals is essential in shaping the future direction in advancing healthcare and biomedical research. The annual event is also a platform for the gathering of scientists and educators to collaborate and share knowledge that make gains in translational research key to cures and prevention of disease in human and animal health.

Phi Zeta Research Day is organized and aligned with the mission of the Phi Zeta Honor Society, 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 scholarship, and other recognitions.
# 20th Annual One Health Symposium

**Theme:** *One Community, One Medicine, One Health*

**Tuskegee University | Thompkins Hall Auditorium**

## Sunday, September 22, 2019 - Kellogg Conference Center

<table>
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<th>Time</th>
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<tbody>
<tr>
<td>4:00 - 7:00 p.m.</td>
<td>Registration and Reception for Speakers - Fairfield Inn &amp; Suites, Opelika, AL</td>
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## Monday, September 23, 2019 - Thompkins Hall Auditorium

<table>
<thead>
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<th>Time</th>
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<tr>
<td>7:30 - 8:30 a.m.</td>
<td>Registration and Continental Breakfast - Thompkins Hall Atrium</td>
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<tr>
<td>8:30 - 8:35 a.m.</td>
<td>Opening Session Moderator: Chair, Crystal M. James, JD, MPH, Head Graduate Public Health, College of Veterinary Medicine, Tuskegee University</td>
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<tr>
<td>8:35 - 8:45 a.m.</td>
<td>Greetings - Lily D. McNair, Ph.D., President, Tuskegee University</td>
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<td>8:45 - 8:55 a.m.</td>
<td>Welcome - Ruby L. Perry, DVM, MS, Ph.D., Diplomate-ACVR, Dean, College of Veterinary Medicine, Tuskegee University</td>
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<td>8:45 - 9:00 a.m.</td>
<td>Introduction of Speaker - George Roberts, Ph.D., First Gentleman Tuskegee University</td>
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<tr>
<td>9:00 - 9:45 a.m.</td>
<td>Keynote Speaker - Maleeka Glover, ScD, MPH, Senior Epidemiologist at the Centers for Disease Control and Prevention in Atlanta, Georgia</td>
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<tr>
<td>9:45 - 10:00 a.m.</td>
<td>Break</td>
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<tr>
<td>10:00 - 10:45 a.m.</td>
<td>Shanda Bishop, Ph.D., MSN, BSN, RNC-OB, Co-Chair, Assistant Professor, School of Nursing and Allied Health, Tuskegee University</td>
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<td>10:45 - 11:30 a.m.</td>
<td>Healthcare Disparities</td>
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<tr>
<td>11:30 - 12:00 a.m.</td>
<td>Break and Transition to Luncheon</td>
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<tr>
<td>12:00 - 1:30 p.m.</td>
<td>LUNCHEON - Public Health Lecture Series</td>
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<tr>
<td>12:30 - 12:45 p.m.</td>
<td>Introduction of Speaker: Crystal M. James, JD, MPH</td>
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<tr>
<td>12:45 - 1:30 p.m.</td>
<td>Second Annual Dr. Kenneth Olden Lecture</td>
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<td>1:30 - 1:45 p.m.</td>
<td>Break</td>
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<tr>
<td>1:45 - 2:45 p.m.</td>
<td>Keynote Speaker: Mary McIntyre, MD, M.D., M.P.H., SSB, Chief Medical Officer, Alabama Department of Public Health</td>
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<tr>
<td>2:45 - 3:30 p.m.</td>
<td>Cervical Cancer Community Engagement Session: Ehsan Abdalla, DVM, MS, Ph.D., Graduate Public Health, College of Veterinary Medicine, Tuskegee University</td>
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<td>2:45 - 3:30 p.m.</td>
<td>Speaker: Julianne Adams Birt, MD, FACOG (OB GYN), Founder and CEO of Radiant Women’s Health, Metro Atlanta</td>
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<td>3:30 - 4:30 p.m.</td>
<td>Break</td>
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<tr>
<td>4:30 - 5:30 p.m.</td>
<td>Community Engagement Session: Kellon Banks 2nd Year Master of Public Health Student, College of Veterinary Medicine, Tuskegee University</td>
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<tr>
<td>4:30 - 5:30 p.m.</td>
<td>Knowledge and Awareness about Cervical Cancer and Human Papilloma Virus (HPV) Among Women Living in Macon County, AL</td>
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<td>5:30 - 7:00 p.m.</td>
<td>Closing Reception and One Health Café (Kellogg Conference Center)</td>
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<tr>
<td>8:30 - 9:00 a.m.</td>
<td>Registration and Continental Breakfast - Patterson Hall Atrium</td>
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<tr>
<td>9:00 - 9:05 a.m.</td>
<td>Opening Remarks - Session One Moderator: Chair, Temesgen Samuel, DVM, Ph.D., Department of Pathobiology, College of Veterinary Medicine, Tuskegee University</td>
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<tr>
<td>9:05 - 9:10 a.m.</td>
<td>Welcome - Ruby L. Perry, DVM, MS, Ph.D., Diplomate-ACVR, Dean, College of Veterinary Medicine, Tuskegee University</td>
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| 9:10 - 9:55 a.m.| Keynote Speaker: Andrea Varela-Stokes, DVM, Ph.D., Associate Professor, Department of Basic Sciences, College of Veterinary Medicine, Mississippi State University  
*Host-Vector-Microbe Systems: Understanding Natural History and the Need for a Better Disease Model* |                                                                                                      |
| 9:55 - 10:15 a.m.| Speaker: Deepa Bedi, MD, PhD, Associate Professor, Department of Biomedical Sciences, College of Veterinary, Tuskegee University  
*Phage display: A Versatile Technology for Cancer Therapeutics and Biomarker Discovery* |                                                                                                      |
| 10:15 - 10:30 a.m.| Christine Robinson, Third Year Veterinary Student, College of Veterinary Medicine, Tuskegee University  
*Efficacy in Mass Spectrometry-Based Detection of Antibiotic Residues in Milk* |                                                                                                      |
| 10:30 - 10:45 a.m.| BREAK                                                                                     |                                                                                                      |
| 10:45 - 11:30 a.m.| Session Two Moderator: Toufic Nashar, DVM, Ph.D., Department of Pathobiology, College of Veterinary Medicine, Tuskegee University |                                                                                                      |
| 11:30 - 11:45 a.m.| Keynote Speaker: David L. Suarez, DVM, Ph.D., ACVM, Virology and Immunology Research Leader Exotic and Emerging Avian Viral Disease Research Unit, Southeast Poultry Research Laboratory, United States National Poultry Research Center USDA, Agricultural Research Service, Athens, GA  
*Newcastle Disease Virus in the United States: How Research Informs Our Control Efforts* |                                                                                                      |
| 11:45 - 12:15 p.m.| Speaker: Graeme Lockaby, MS, Ph.D., Associate Dean for Research, Clinton McClure Professor, and Director of the Center for Environmental Studies at the Urban-Rural Interface (CESURI), School of Forestry and Wildlife Sciences, Auburn University  
*Environmental Factors influencing the Distribution of Tick Species and Pathogens in Alabama* |                                                                                                      |
| 12:15 - 1:30 p.m.| Lunch and Poster Session                                                                 |                                                                                                      |
| 1:30 - 2:00 p.m.| Session Three Moderator: Ebony Gilbreath, DVM, Ph.D., DACVP, Department of Pathobiology, College of Veterinary Medicine, Tuskegee University |                                                                                                      |
| 2:00 - 2:15 p.m.| Speaker: Shannon Boveland, DVM, Associate Clinical Professor of Ophthalmology, Department of Clinical Sciences, College of Veterinary Medicine, Auburn University  
*Case Series: Corneocconjunctival Transposition with and without Acell in 15 Dogs* |                                                                                                      |
| 2:15 - 2:30 p.m.| Derek Carn, Third Year Veterinary Student, College of Veterinary Medicine, Tuskegee University  
*Probiotic Supplementation to Cope with Anxiety in Canines* |                                                                                                      |
| 2:30 - 3:00 p.m.| BREAK                                                                                     |                                                                                                      |
| 3:00 - 3:15 p.m.| Samantha Special, Third Year Veterinary Student, College of Veterinary Medicine, Tuskegee University  
*Reducing Salmonella Burden in the Pet Guinea Pig Industry* |                                                                                                      |
| 3:15 - 3:30 p.m.| Sage H. Shaddox, Second Year Veterinary Student, College of Veterinary Medicine, Tuskegee University  
*Reviewing the Effects of TNR on Feral Cat Populations* |                                                                                                      |
| 3:30 - 3:45 p.m.| Awards for Oral and Poster Presentations (Sponsored by Merck Animal Health)  
Phi Zeta Research Scholars Recognition (Sponsored by HRSA-COE and T35 NIH Grants) |                                                                                                      |
One Health Symposium Keynote Speaker

Maleeka Glover, ScD, MPH,
Senior Epidemiologist at the Centers for Disease Control and Prevention

Maleeka Glover is a Senior Epidemiologist at the Centers for Disease Control and Prevention in Atlanta, Georgia. She is trained as a Social Epidemiologist and holds a doctorate in Health and Social Behavior from the Harvard School of Public Health, where she majored in Social Epidemiology and Biostatistical Methods for Community Based Research. Glover received a Master of Public Health degree in Epidemiology from the University of Michigan School of Public Health. She is also a Certified Health Education Specialist (CHES).

Currently, Glover is the Director for the CDC Medical investigations Team. The Medical Investigations Team (MIT) supports CDC preparedness before, during and after all public health emergencies by responding to and monitoring clinical inquiries, coordinating the health surveillance monitoring of responders, and establishing domestic emergency response teams (CERTs). She and her team support all activations, but also support non-response activities and monitor event of interest around the world. Most recently, in addition to supporting the last Hurricane season and Zika Response, Glover made a significant contribution to the Ebola Response. Glover’s duties include technical consultations on potential Ebola cases, facilitation of appropriate lab testing, supervision and training of team members, international epidemiology studies and protocol development, and development of enhanced surveillance approaches for Ebola in the United States. She also played a significant role in the investigation of the first US case of Ebola. Glover participated in the Indian Health Service Clinical Rounds, to provide accurate and updated information regarding Ebola to tribes and tribal-serving organizations.

Glover served in a leadership role for 9+ years as the lead for Vulnerable Populations emergency response planning and has developed and led an innovative agenda to engage public health subject matter experts (SMEs) both within and outside government. She was lead for planning for Pandemic Influenza with the Influenza Coordination Unit (ICU) at CDC. In this role she provided leadership and coordination for the planning and response activities for vulnerable populations for seasonal influenza and during a pandemic. She also led influenza related vulnerable population projects with CDC subject matter experts and external partners. Dr. Glover led the Pregnancy and Influenza Workgroup, the Mobile Texting and Pandemics project, supported the Nurse Triage Line for Pandemics project, and supported other ICU special projects as needed. She has developed and implemented a comprehensive planning and exercising program to address the unique needs of these vulnerable populations, even beyond influenza. Glover has cultivated outcome-oriented partnerships with external professional organizations that serve vulnerable populations. In this capacity, she has coordinated activities and convened experts from across the agency, ensuring the most efficient and effective planning for pandemics and other responses.

Prior to working with the ICU, Glover’s work with CDC focused on community based research, health disparities and chronic diseases, specifically heart disease and stroke and the behavioral/social factors that influence them. As an Epidemiologist for the National Center for Chronic Disease Prevention and Health Promotion (NCCDPHP), she was a lead research officer with responsibility for planning, conducting, and evaluating and interpreting research projects; preparing scientific articles and technical reports; research expertise and advice on the health impact of chronic disease research; and leadership for chronic disease preparedness planning and training. She played a provided subject matter expertise and coordination for national and international activities which focus on conducting analyses of CVD and relevant risk factor disparities by specific characteristics. Glover also served as the Lead Emergency Coordinator for the Center. She was the primary point of contact for information transmitted between the CDC Emergency Operations Center (EOC) and the other centers for all emergencies, and supported critical planning, training, and program activities on a regular basis. Glover supported development of best practices and preparedness materials for chronic disease and vulnerable populations, and she coordinated collaborations with external and internal partners and federal/state/local SMEs.
Shanda Bishop is an assistant professor in the Department of Nursing at Tuskegee University where she teaches pediatrics, obstetrics, fundamentals, health assessment, and leadership/management in nursing. As a part of her personal mission, Bishop is focused on helping her students achieve their highest professional goals while concurrently focusing on mind-fullness and achieving self-care.

Bishop is certified by the National Certification Corporation (NCC) as an Inpatient Obstetric nurse. Her research interest focus on health disparities surrounding the care of women and children.

She resides in Daphne, Alabama with her husband of 27 years. They have three children all of whom are attending graduate or undergraduate school. Dr. Bishop is also serving as this year's One Health Symposium co-chair.
Pamela Payne-Foster, MD, MPH,
Preventive Medicine/Public Health, Professor Department of Community Medicine/Population Health, Deputy Director, Institute for Rural Health Research at The University of Alabama (UA) School of Medicine

Pamela Payne-Foster is a Preventive Medicine/Public Health Physician who is professor in the Department of Community Medicine/Population Health and Deputy Director, Institute for Rural Health Research, at The University of Alabama School of Medicine, Tuscaloosa Regional Campus (UA College of Community Health Sciences). Her firsts include: First Black faculty in the Department of Community and Rural Medicine and the Institute for Rural Health Research and the first Black faculty in the Department to receive Full Professor promotion status.

Payne-Foster received a bachelor's degree in Chemistry Pre-Medicine from Xavier University of Louisiana and a master’s degree in Biomedical Sciences and the Doctor of Medicine degree from Meharry Medical College in Nashville, Tennessee. She also completed her Internal Medicine internship and Preventive Medicine/Public Health residency from the State University of Stony Brook where she also received her MPH from Columbia School of Public Health. Before coming to the University of Alabama, she has served on the faculty of a variety of institutions including Morehouse School of Medicine, George Washington University, State University of New York Stony Brook, and the National Bioethics Center for Health Care and Research at Tuskegee University.

In addition to her broad training experiences in preventive medicine and public health, her career has focused on a wide variety of interests including racial/ethnic health disparities, bioethics with an interest on the intersection between social justice and health, and community based participatory or engaged research. Most recently through her work in Alabama, she has more specifically focused on HIV/AIDS related stigma in rural faith-based settings in the Deep South. Foster has received numerous awards for her work including:

- Distinguished Community Engaged Scholar (Faculty/Staff), Presented by the Vice President, Office of Community Affairs, The University of Alabama, 2017
- The Janet Donoghue Red Ribbon Award for exemplary service in fight against HIV/AIDS in the Health Professional Category, by Community Faith Partners, Huntsville, Alabama, 2016
- Fulbright Foundation Specialist Award, Cadi Ayaad University, Marrekesh, Morocco, 2016
- Invitee to the White House meeting in HIV/AIDS Stigma Research: A Call to Action, Sponsored by National Institutes of Mental Health and The White House Office on AIDS.

In addition to teaching medical students Payne Foster has also engaged heavily in the education and personal and professional development of undergraduates and graduate students at the University of Alabama. She also serves on a variety of committees both within her college and across the University of Alabama campus including: Chair of the Medical School’s 50th Anniversary of the Integration of the University of Alabama, Former University of Alabama Faculty Senator and Co-Chair of the Faculty Life Committee, and Past President of the Black Faculty and Staff Association. In addition to her service at the University, Foster is heavily involved in community service both nationally as well as locally having served or currently serving on a number of boards including: National Black Women’s HIV/AIDS Network, National Parents Association for the Students and Graduates of the Latin American School of Medicine, Inc., Tuscaloosa Co-Leader Moms Demand Action, Tuscaloosa Sister Cities Project, West Alabama Sickle Cell Association, Five Horizons, the Governor’s Task Force for Women’s Health and Co-Founder with her husband of her own nonprofit organization, AframSouth, Inc.

Payne-Foster is married to William Foster, a retired social worker and they currently reside in both Tuscaloosa and Montgomery and love to have date nights on Tuesdays at the movies and travel both domestically and internationally.
Dr. Kenneth Olden

About Kenneth Olden Distinguished Lecture Series

This lecture hosted annually by the Department of Graduate Public Health (DGPH) highlights a scholar and/or advocate in Environmental Health Sciences that has or is currently conducting research and/or advocating for advances that will help to decrease health disparities in rural and other marginalized communities. This lecture series highlights faculty, policy makers, and community leaders that are trail blazers in this field like the distinguished scholar for which it is named.

From 1991-2005, Kenneth Olden was Director of the National Institute of Environmental Health Sciences (NIEHS) of the National Institutes of Health (NIH) and the National Toxicology Program (NTP) in the U.S. Department of Health and Human Services. He was the first African American to become Director of one of the NIH Institutes. In 2005, Ogden resigned as Director so he could devote full time to his research and position as Chief of the Metastasis Group in the Laboratory of Molecular Carcinogenesis at the NIEHS. He also held the position of Yerby Visiting Professor at the Harvard School of Public Health for the academic year 2006-2007, and was Founding Dean of the School of Public Health at the City University of New York from 2008-2012. From 2012-2016, Ken served as Director of the National Center for Environmental Assessment in the U.S. Environmental Protection Agency (EPA).
Kenneth Olden Distinguished Lecturer

Gwen W. Collman, Ph.D.,
Director, Division of Extramural Research and Training, National Institute of Environmental Health Sciences

We are pleased to announce that Gwen Collman, Director of the Division of Extramural Research and Training at the National Institute for Environmental Health Sciences (NIEHS), will give the Second Annual Kenneth Olden Lecture as a part of the One Health Symposium. Collman in her role at NIEHS directs scientific activities across the field of environmental health sciences including basic sciences (i.e., DNA repair, epigenetics, environmental genomics), organ-specific toxicology (i.e., reproductive, neurotoxicology, respiratory), public health related programs (i.e., environmental epidemiology, environmental public health), and training and career development. She also oversees the implementation of the Superfund Research Program and the Worker Education and Training Program.

Prior to her current role, Collman served in program development and management, beginning in 1992 as a member, then as Chief of the Susceptibility and Population Health Branch. During this time, she directed research on the role of genetic and environmental factors on the development of human disease, from animal models of genetic susceptibility to population studies focusing on etiology and intervention. She was responsible for building the NIEHS grant portfolio in environmental and molecular epidemiology, and developed several complex multidisciplinary research programs. These include the NIEHS Breast Cancer and the Environment Research Centers Program, the NIEHS/EPA Centers for Children's Environmental Health and Disease Prevention, and the Genes, Environment and Health Initiative. Also, under her guidance, a team created a vision for the Partnerships for Environmental Public Health programs for the next decade.

Collman is the recipient of numerous NIEHS Merit Awards, two NIH Director's Awards, and the HHS Secretary's Award for Distinguished Service. She received a Ph.D. in Environmental Epidemiology from the University of North Carolina School of Public Health where she was awarded the 2009 H.A. Tyroler Distinguished Alumni Award. Collman’s commitment to excellence in the field of public health as well as providing opportunities for your researchers to receive training in the field of environmental health research exemplifies our theme for this year’s symposium “One Community, One Medicine, One Health”.

[Image of Gwen W. Collman, Ph.D., Director, Division of Extramural Research and Training, National Institute of Environmental Health Sciences]
Mary McIntyre, MD, M.D., M.P.H., SSBB, Chief Medical Officer, Alabama Department of Public Health

Mary G. McIntyre, M.D., M.P.H., SSBB is Chief Medical Officer for the Alabama Department of Public Health (ADPH). McIntyre received her B.S. in biology from Winston Salem State University in Winston Salem, NC. She earned her medical degree from Meharry Medical College in Nashville and served as resident physician in Internal Medicine at the George Hubbard Hospital in Nashville, TN. She obtained a Master’s of Public Health in Health Care Organization and Policy from the University of Alabama at Birmingham. She studied Lean and Six Sigma at Villanova University from 2010-2011. She is board certified in Public Health and General Preventive Medicine through the American Board of Preventive Medicine. She joined ADPH in January 2011, and served as Assistant State Health Officer for Disease Control and Prevention and State Epidemiologist before taking her current position. Prior to beginning her public health career, she served in various roles at the Alabama Medicaid Agency for 14 years. She provided primary care for 11 years before joining the state.

McIntyre is a member of the Council of State and Territorial Epidemiologists, the American Public Health Association, the Alabama Public Health Association, the Association for Professionals in Infection Control and Epidemiology, the American Medical Association, and the Medical Association of the State of Alabama.

She is most proud of being a wife and mother to four amazing adults and a grandmother to three.
Julianne Adams Birt, MD, FACOG (OB GYN),
Founder and CEO of Radiant Women’s Health, Metro Atlanta

Julianne Adams Birt is a leading voice for women’s health. In her fourteenth year of practice, she is the founder and CEO of Radiant Women’s Health in metro Atlanta. She landed south from Harrisburg, PA to matriculate at Clark Atlanta University, taught high school science and health in the Atlanta Public Schools and then obtained her medical degree from Morehouse School of Medicine. As the first black female physician to graduate from Allegheny General Hospital’s ob/gyn residency program, she led as chief resident in her solo fourth year.

Birt is a personable physician who has grown her practice exponentially serving women from throughout metro Atlanta and has the reputation of being an educator in the exam room. Her fervor for women’s health and notably female sexual health and dysfunction has brought her before the FDA, U.S. congressmen and conferences where she advocates for sexual health equity for women. She also serves as an advisor and speaker for several pharmaceutical companies. She has an ongoing presence in schools, churches and community events which led to the formation of Dr. Ju Delivers, her platform she uses “pushing wellness for women.”

She has held several leadership roles as department chairman at DeKalb Medical – Hillandale and Rockdale Medical Centers. She served proudly as the 2017 president of the Atlanta Medical Association (AMA), the pillar organization upon which the National Medical Association (NMA) was founded. She is the immediate past Chairman of the Board of the AMA, serves as assistant secretary for the Georgia State Medical Association (GSMA) Board and was elected to the Council on Concerns of Women Physicians for NMA for the 2017-2020 term.

A love for community drives her volunteerism and she has served as medical director for a pregnancy center and is an Assistant Professor of Community Medicine for Mercer University School of Medicine. Fluent in American Sign Language, on occasion she can be seen at church interpreting for the Deaf. In July 2018, she was recognized by Alpha Kappa Alpha Sorority, Inc. for twenty-five years of membership and service.

Birt has received business and community awards but was honored when recognized by her peers as the 2015 AMA Young Physician of the Year and in 2019 was bestowed the GSMA Distinguished Service Medallion. Juggling a solo practice, community work and leadership responsibilities is challenging but she is passionate about each role she plays. But, none are so revered as that of wife and mother.
One Health Symposium Speaker

Kellon Banks, BS,
Graduate Research Assistant, Graduate Public Health Student (GPHP),
College of Veterinary Medicine, Tuskegee University

Kellon Banks is a native of Monroeville, AL. She received her Bachelor of Science in Environmental Science with a concentration in Environmental Health Science from Alabama Agricultural and Mechanical University (AAMU) in 2018.

Throughout her years of study, Banks has shown her excellence in conducting research, writing, and presenting research data. During her time at AAMU, she demonstrated her excellence through internships and co-ops. She served as an REU Bionenergy Researcher at South Dakota State University as well as a Supply Chain and Operations Intern for Land O’Lakes Inc. for 2 consecutive summers in their Environmental Health and Safety department. In addition to these off-campus experiences, she also conducted research within the Department of Biological and Environmental Sciences at AAMU for majority of her time there.

She then matriculated to Tuskegee University to pursue her Master’s degree in Public Health from the College of Veterinary Medicine, where she is a graduate research assistant working on increasing the knowledge and awareness of HPV and Cervical Cancer in rural communities. Banks is also a field researcher at Auburn University working on a Wellness Project with their Social, Health, and Racial Equity lab to promote health and implement change in underserved communities. In addition to her scholastic achievements, she is also engaged in a variety of community wellness projects throughout her community and campus. She is currently completing her final year of her MPH with plans to graduate in May of 2020 and further her education by pursuing her Ph. D. in Health Education/Promotion.
Phi Zeta Research Day Keynote Speaker

Andrea Varela-Stokes, DVM, Ph.D.,
Associate Professor, Department of Basic Sciences, College of Veterinary Medicine, Mississippi State University

Andrea Varela-Stokes earned a Bachelor of Science degree in Animal Science from Rutgers University, in New Jersey, in 1997. She initially became interested in parasitology while conducting her senior research project which involved evaluating the pasture distribution of gastrointestinal helminths of horses. Next, she attended Tufts University (Cummings School of Veterinary Medicine) where she earned a DVM. During this time, she participated in two summer research projects focused on wildlife parasitology in Kenya. Upon graduating in 2001, she entered a PhD program in Infectious Diseases at the University of Georgia were, she studied tick-borne disease, focusing on Borrelia and Ehrlichia in lone star ticks. Toward the end of her doctoral studies, she was awarded an NIH K08 Clinical Mentored Scientist Grant, which supported her post-doctoral fellowship, also at UGA. She was also fortunate to meet her husband there, who was working on a graduate degree studying host-cell invasion of P. falciparum malaria. In 2001, Varela-Stokes joined the Department of Basic Sciences at Mississippi State University College of Veterinary Medicine. Currently, she is an associate professor teaching parasitology in the veterinary curriculum. While her research has spanned epidemiology and infection dynamics of various vector-borne diseases (e.g. Hepatozoonosis) as well as non-vector-borne parasites (e.g. Toxoplasma gondii), her main area of focus is tick-borne rickettsiae.

Her current research involves host-vector-pathogen interactions using a guinea pig-tick-Rickettsia model system. This shift into host immunology offers opportunities to develop novel assays for studying the immune response of guinea pigs to rickettsial challenge and to develop a project with her husband as a co-investigator.

Outside of MSU-CVM, she enjoys being outdoors and spending time with her husband, their ten-year-old son and their critters (a blue heeler, two cats, and a leopard gecko).

Abstract

Host-Vector-Microbe Systems: Understanding Natural History and the Need for a Better Disease Model

For tick-associated bacteria, transmission to humans depends on a combination of factors that include competent tick vectors and reservoir hosts that maintain the bacteria in nature. While vertebrate reservoir hosts can be used to study the natural history of tick-associated bacteria, an animal model that demonstrates clinical signs is most appropriate to understand disease mechanisms due to the transmitted pathogens. Over the last 18 years, our research has evolved from surveillance and infection dynamics of tick-associated bacteria to host-vector-pathogen interactions. Initially, we investigated *Ehrlichia chaffeensis*, the causative agent of human monocytic ehrlichiosis, in *Amblyomma americanum* ticks and white-tailed deer, demonstrating low infection rates in ticks and persistent infection in deer. At a time when “Southern Tick-Associated Rash Illness” was thought to be caused by *Borrelia lonestari*, we isolated the organism from *A. americanum* and demonstrated infectivity in the primary reservoir, deer. Due to a marked presence of *Amblyomma maculatum* ticks in Mississippi, and emergence of *Rickettsia parkeri* rickettsiosis, we concentrated our next efforts on surveillance of spotted fever group rickettsiae (SFGR) in ticks and transmission to vertebrate hosts. Currently, we are interrogating the vertebrate host immune system during *R. parkeri* rickettsiosis. Specifically, our long-range goal is to define the clinical and immune responses to SFGR exposure using a guinea pig model and immunological assays that our laboratory is developing. Guinea pigs are a more relevant model for spotted fever rickettsiosis than mice because they recapitulate clinical disease as presented by humans, tick transmission is feasible, and the human immune system is demonstrably more like that of a guinea pig than to mice. To date, our laboratory has demonstrated clinical disease characteristic of *R. parkeri* rickettsiosis after natural tick transmission in guinea pigs. We developed and are currently using a 5-color flow cytometric panel to assess immunological changes in the guinea pig during exposure to pathogenic and non-pathogenic SFGR and after challenge with pathogenic SFGR, supplementing this information with data including serological response, rickettsemia and clinical disease. As we begin to understand immunity to SFGR using an animal model that is more relevant than mice to human health, we believe our approach will have a broader impact on other infectious disease research that already relies heavily on the guinea pig model (e.g., tuberculosis), and will also benefit studies that potentially lead to novel vaccine development.
Phi Zeta Research Day Speaker

Deepa Bedi, MD, Ph.D.,
Associate Professor, Department of Biomedical Sciences, College of Veterinary, Tuskegee University

Deepa Bedi is an Associate Professor in the Department of Biomedical Sciences, College of Veterinary Medicine at Tuskegee University. She attended Tashkent State Medical Institute (Doctor of Medicine) and Auburn University (PhD). Her current research focuses on using combinatorial phage technology to develop anticancer targeted nanomedicines. Targeted cancer therapeutics has a distinct advantage over non-targeted as it considerably increases the concentration of drug near the site of tumor and amplify the therapeutic effect while minimizing the cytotoxic effect. Bedi’s research interest also includes identification of novel markers in diseased states.

Abstract
Phage Display: A Versatile Technology for Cancer Therapeutics and Biomarker Discovery

Phage display is a versatile platform for identification of specific and selective ligands to any target. Phage display allows the expression of large peptide and protein libraries on the surface of filamentous phage with a diversity of $10^9$ peptides of different permutations, which leads to the selection of peptides and proteins, with high affinity and specificity to almost any target. Phages can be easily manipulated chemically or by genetically engineering without losing their infectivity and functionality. Its versatility can be harnessed and engineered for the development of biomarker and drug discovery. Our lab has been using this technology for the identification of biomarkers and development of molecularly targeted probes for the detection of various cancer disease processes and as vehicles for targeted drug delivery. In our previous work, we have developed novel phage-based platforms for anti-cancer drug delivery. In our recent work, we have identified novel markers that play a role in breast cancer metastasis. Using phage display, we have identified Neuroligin 4X and Heat Shock Protein 60 (HSPD1) on breast cancer cells and elucidated their role in the progression and metastasis of breast cancer.
Efficacy in Mass Spectrometry-Based Detection of Antibiotic Residues in Milk

Christine Robinson, Teshome Yehualaeshet, and Brandon Gines
Department of Pathobiology, Department of Chemistry, College of Veterinary Medicine, College of Arts & Sciences, Tuskegee University, Tuskegee, AL

Antibiotic residues are trace amounts of antibiotic metabolites which can be found within body tissues or passed out through elimination. Accumulation of antibiotic residues has contributed to a wide range of health hazards including allergic reactions, toxicity, and teratogenicity. In attempts to reduce the occurrence of antibiotic residues organizations such as WHO, CDC, and the FDA have increased surveillance, modified legislation, and provided education to the public and the users. The aim of this study was to determine the efficacy of extraction and detection of antibiotic residues in various milk samples using liquid chromatography and mass spectrometry in tandem (LC/MS). The following milk samples were collected; goat milk (pasteurized/non-pasteurized), cow milk, almond milk, and coconut milk. Antibiotics analyzed were amikacin, gentamycin, neomycin, oxytetracycline, penicillin-G, sulfadimethoxine, and sulfamethoxazole/trimethoprim. Results indicated the detection and extraction methods had suitable efficiencies in determining the presence of the above-mentioned antibiotics, except the aminoglycoside class. Differences among antibiotic classes in various milk matrices may require modification in technique for optimal detection using LC/MS. Given the efficiency of our extraction and analytical results, further research should be directed towards establishing a standardized extraction method for milk sources.

Research Grant: DHHS COE Grant #: D34HP00001      RCMI core facility Grant #: U54MD007585
David Lee Suarez obtained a degree in Veterinary Medicine in 1988 from Auburn University. He obtained his Ph.D. degree from Iowa State University in Veterinary Microbiology in 1995. Suarez is board certified in the American College of Veterinary Microbiology in both Virology and Immunology. From 1988 to 1991, he worked as an Associate veterinarian at Quintard Veterinary Hospital in Anniston. Suarez remains a licensed veterinarian in the state of Iowa. Suarez was a Post-doctoral Research Associate at the Plum Island Animal Disease Center, New York. He joined the Southeast Poultry Research Laboratory, Agriculture Research Service, USDA in 1995 as a Veterinary Medical Officer in 1995. In 2005, Suarez became Research Leader of the Exotic and Emerging Avian Viral Disease Research Unit with the same institution. He was Acting Laboratory Director from June 2010-October 2011. His primary research interests are avian influenza virus (AIV) and Newcastle disease virus (NDV). Since 1996, Suarez has held the position of Adjunct Instructor in the Department of Infectious Diseases, University of Georgia. He is actively involved with numerous international collaborative projects.

Abstract

Newcastle Disease Virus in the United States: How Research Informs Our Control Efforts

Newcastle disease is considered a foreign animal disease in the United States. In May of 2018, virulent Newcastle disease virus (NDV) was detected from several sick chickens presented to a veterinary clinic in southern California. After the initial detection, the virus has been detected in over 450 backyard flocks in four counties in southern California and 2 additional states through June 2019. Research supports that the virus is highly poultry adapted and causes high mortality in both young and adult chickens. The virus can be detected in infected birds in as little as 24 hours after exposure and may shed virus but be asymptomatic for several days before showing clinical disease. Related work on transmission studies with poultry adapted and wild bird adapted NDV showed that the poultry adapted viruses could easily infect and transmit in poultry. However, wild bird viruses required a much higher dose to infect chickens, and the virus did not transmit chicken to chicken. Additional studies on vaccination of chickens showed traditional and HVT-vectored vaccines were protective from the California 2018 challenge virus. The use of real-time RT-PCR has become the critical tool to accurately and quickly identify infected birds which supports our eradication efforts.
Abstract

Effects of Heat Pretreatment Method on Heartworm Antigen Detection on Dogs

Heartworm infection is prevalent in dogs in Alabama due to its warm humid climate, as the disease is transmitted by mosquitos. Although treatable, dogs with heartworm infection suffer from inflammatory damages. In recent years, multiple studies have reported conversion of the results of heartworm antigen tests from “no antigen detected” to “antigen positive” when blood samples were used as directed by manufacturers and when the serum was heated. Possible causes of such conversion include release of antigen-antibody complex, sample handling and cross-reaction with other helminths. In this study, direct smear for microfilaria, antigen test with whole blood or serum (standard method), and, antigen test with pre-heated serum (heated method) were performed on blood samples collected from 117 dogs with owners or at shelters. Among these samples, microfilariae were observed in 6.3% (5/79) and heartworm antigen was detected in 15.4% (18/117) by the standard method. Conversion from “no antigen detected” to “antigen positive” by the heated method was found in 3.7% (4/109). Three of the converted cases exhibited no clinical signs associated with heartworm infection. The fourth case had a history of positive heartworm test 2 years prior, and the dog had been placed on prevention without adulticide since then. The owner reported coughing at time of blood collection. Further research is needed to investigate the causes of conversion and when to use the heat method for heartworm testing in dogs.

Research support: DHHS COE Grant # D34HP00001, RCMI core facility grant # U54MD007585
Student support: DHHS COE Grant # D34HP00001
Graeme Lockaby is a Professor and Associate Dean of Research in the School of Forestry and Wildlife Sciences at Auburn University. He also serves as the Clinton – McClure Endowed Professor in that School. Lockaby 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 on the biogeochemistry of forested floodplains and relationships between landscapes and human health. In particular, his biogeochemistry studies have centered on decomposition and relationships between nutrient circulation in floodplains and net primary productivity. Lockaby has also studied the influence of altered hydrology, degraded water quality, and forest fragmentation on the incidence of West Nile virus. In addition, his studies include the examination of relationships between the natural environment and tick species distribution and associated pathogen occurrence. Lockaby has authored or co-authored 112 refereed journal articles and numerous abstracts and other publications. He has served as major professor for 30 graduate students and, in 2017, was awarded the William Patrick Wetlands Lectureship by the Soil Science Society of America.

Abstract

Environmental Factors influencing the Distribution of Tick Species and Pathogens in Alabama

Based on our collections, the most abundant tick species in Alabama is the Lone Star followed by Gulf Coast and American Dog, and Blacklegged. Overall, tick abundance was highest in July although numbers varied seasonally for different species. In terms of land use/land cover (LU/LC), deciduous cover exhibited higher numbers compared to the other habitats. As was the case with seasonal abundance, species varied in terms of the LU/LC with which each was predominately associated. Pathogen analysis showed that high proportions of ticks carried Rickettsia sp., and these ranged up to 30-40% at some locations. Lower proportions (upper range 4-5%) were infected with Ehrlichia sp. In general, the Camden and Barbour locations showed the highest percent infections although other locations varied widely. None of the ticks tested positively for Lyme disease. Factors such as LU/LC, foliar Al concentrations (an indicator of soil acidity), maximum temperature per plot, minimum humidity per plot, and foliar N concentrations (an indicator of browse quality) were significantly linked to the likelihood of tick presence. Efforts to relate animal counts to tick presence using game camera photos were unsuccessful due to the high variation associated with the data.
Phi Zeta Research Day Speaker

Shannon Boveland, DVM,
Associate Clinical Professor of Ophthalmology, Department of Clinical Sciences,
College of Veterinary Medicine, Auburn University

Shannon D. Boveland received her DVM from Tuskegee University, College of Veterinary Medicine in 2000. She completed an internship in Small Animal Medicine and Surgery in 2001 at Tuskegee, and an Ophthalmology Residency in 2008 at The University of Georgia, College of Veterinary Medicine. Following her residency, Boveland worked as a Clinical Instructor at The University of Georgia for one year. Upon completing this appointment in 2009, she returned to Tuskegee University, College of Veterinary Medicine as an Assistant Professor and was later promoted to Associate Professor. Boveland is currently an Associate Clinical Professor of Ophthalmology in the Department of Clinical Sciences at Auburn University, College of Veterinary Medicine. She is a member of the American College of Veterinary Ophthalmologist.

Abstract

Case Series: Corneoconjunctival Transposition with and without Acell in 15 Dogs

AV Keenan, SD Boveland, RM Rodriguez Galarza, RJ McMullen Jr, PA Moore
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Purpose: To document a case series using corneoconjunctival transposition (CCT) surgery with and without bioscaffolding matrix (ACell®) to repair deep corneal ulcers and perforations in dogs. Methods: Dogs that underwent CCT with or without ACell® (Vet Corneal Discs, Columbia, MD) between 2017-2018 were included. CCT grafts (~50% corneal depth) were sutured using a simple interrupted 8-0 or 9-0 polyglactin 910 pattern. Results: Fifteen dogs (17 eyes) received a CCT under general anesthesia (5 deep corneal ulcers and 11 perforated corneal ulcers, 8 of which received an ACell® graft). A single dog had a CCT repeated due to the development of multiple epithelial inclusion cysts. Lesions were located axially in 14/17 (82%) eyes. Grafts were harvested from dorsal (n=7), lateral (n=6), ventral (n=2), or medial (n=2) quadrants. The Shih Tzu breed (7/15) was overrepresented. Keratoconjunctivitis sicca was present in 9/17 eyes (53%). Bacteria cultured from 8 eyes included Staphlococcus intermedius (n=4), Streptococcus canis (n=2), Klebsiella pneumoniae (n=1), Pseudomonas aeruginosa (n=1), and Staphlococcus schleiferi (n=1). Postoperative therapy included topical antibiotics, plasma, cycloplegics, and oral antibiotics and non-steroidal anti-inflammatory drugs. CCT integration with and without ACell® occurred at a mean of 16 days (range 7-23 days). Mean follow up time was 16 weeks. Two eyes were non-visual at last follow up due to a diabetic cataract and cataract likely secondary to a two week preoperative corneal perforation. Conclusions: Corneoconjunctival transposition with ACell® can be utilized for corneal repair in dogs. Graft integration occurred within 3 weeks. None.
Abstract
Probiotic Supplementation to Cope with Anxiety in Canines

Therapeutic drugs that have been made available have displayed efficiently with treating of neurological components in individuals; specifically has the absence of harmful effects on patients. It is becoming a common occurrence of seeing dogs that are experiencing anxiety. These may include suffering from fear, noise phobias, and separation to name a few. Nestle Purina PetCare has released a nutritional supplement formulated to support dogs suffering from fear or anxiety. Purina Pro Plan Veterinary Supplements Calming Care is a probiotic to combat these issues. Calming Care contains the probiotic strain Bifidobacterium longum (BL999). This specific strain has displayed success in helping animals maintain calm behavior. Development of the supplement began with a 15-week blinded, placebo-controlled crossover study. During this, BL999 was given to 24 Labrador retrievers that exhibited anxious behaviors. In the study, over 90 percent of the dogs were able to show improvement in their anxious behaviors over the course of the study. Results of the study display that heart contractility remains the same during trials with the supplements. In addition, a positive state emotional state is achieved. Due to Calming Care, probiotics are now being considered more to cope with anxiety in animals.

Research Grant: DHHS COE Grant # D34HP00001
Patrick Mills, DVM,
Associate Clinical Veterinarian, Third Year Laboratory Animal Resident
Centers for Disease Control and Prevention, Atlanta, GA

Patrick Mills received his DVM from Tuskegee University in 2017. He is currently a third year laboratory animal resident at the Center of Disease Control and Prevention in Atlanta, Georgia. His interests include surgical models, infectious disease research, teaching and clinical medicine. In his free time, Mills enjoys cooking, traveling and spending time with his Weimaraner, Tyson.

Abstract
Reducing Salmonella Burden in the Pet Guinea Pig Industry

This presentation was a collaborative effort of an outbreak task force developed in response to a multistate Salmonella outbreak in 2017 of which nine human cases were infected in eight states. A federal Investigation found evidence that pet guinea pigs were likely the source of the outbreak. The current manuscript is due for publication pending clearance and suggest 10 refinements to help reduce salmonella burden in the Pet Guinea Pig industry.
Abstract

Reviewing the Effects of TNR on Feral Cat Populations

Samantha Special, Veterinary Medicine Teaching Hospital, Tuskegee University College of Veterinary Medicine, Tuskegee, Alabama

Feral cat populations have long been considered an issue for both urban and rural communities. In addition to nuisance behaviors such as marking and leaving waste, harming resident owned cats and wildlife, and posing direct and indirect threats to humans; they are also implicated in pathogen transmission to humans, cats and wildlife (Crawford 2019). A simulated population model designed in 2009 indicated that an uncontrolled population can grow over 25% (Schmidt 2009). While there are many methods to control populations of feral cats, surveys have shown increased public support for trap-neuter-release (TNR) programs over lethal methods (Wolf 2019). TNR programs consist of trapping, sterilizing, and returning these animals to their original location. Removing friendly individuals for rehoming and providing various levels of veterinary care (such as vaccines, parasite control, and basic veterinary care) are also components that may be integrated into TNR programs. While these programs have gained favor amongst the public and are being increasingly implemented worldwide, research is ongoing as to whether or not these programs actually reduce feral cat population size while improving the welfare of the individual cats. One study found that a single TNR event did not have a significant impact on the size of the feral cat colonies for the year the population was monitored (Bissonnette 2019). However, a community cat program lasting for three years resulted in the decline in the rates of both feline euthanasia and shelter intake (Spehar 2018). A second program lasting for nine years reported similar decreases in a population located on a university campus (Swarbrick 2018). Another program in Florida that lasted for 23 years resulted in marked decrease in population size as well as an increase in the average age of the population members and a decrease in the incidence of retroviruses, which the study interpreted as an increase in the colonies’ general welfare (Kreisler 2019). These longer programs were different from the first study in that they also removed friendly animals for adoption and provided additional veterinary care to the colonies. These results indicate that TNR programs are effective if performed consistently and in conjunction with other efforts such as removing friendly individuals for rehoming. Further research has begun to monitor the activities of these cats and assess their environmental impact (Hernandez 2018). However, more research has to be conducted to fully determine the populations’ welfare and impact on their surroundings and wildlife.

Research Grant: DHHS COE Grant # D34HP00001
Phi Zeta Research Day Speaker

Sage H. Shaddox,
Second Year Veterinary Student, College of Veterinary Medicine, Tuskegee University

Abstract

Immunoregulatory Molecular Responses to Treatment of Colon Cancer Cells with Topoisomerase Inhibitors

Sage H. Shaddox, Temesgen Samuel
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Colon cancer is the third most prevalent cause of cancer related deaths in the United States. Camptothecin (CPT) and Irinotecan (IRI) are chemotherapeutic drugs that inhibit Topoisomerase, an enzyme which unwinds the double helix of DNA during replication. Topoisomerase inhibitors are not specific to tumor cells, causing side effects. Identifying molecular targets that synergize with Topoisomerase inhibitors may reduce the therapeutic dose needed and therefore reduce the side effects. Previous studies have shown that topoisomerase inhibitors induce NF-kB pathway and upregulate the checkpoint protein Programmed Death-Ligand 1 (PD-L1) in colorectal cancer cells. The aims of this study were to measure the expression of OPN, TRL-9, and PD-L1 in cell lysate by Western Blotting (WB) and to detect the expression of PD-L1 by flow cytometry. SW620 cells were cultured in medium containing regular fetal bovine serum (FBS) or in charcoal-stripped FBS, and then treated with either CPT or IRI. Our results indicate that PD-L1 expression was upregulated in SW620 cells treated with CPT and IRI. OPN expression was upregulated in medium with regular FBS and CPT treatments, while the charcoal-stripped FBS treatment did not reveal a difference in expression. TLR-9 expression did not vary among CPT treatments under both culture conditions. IRI treatment increased the expression of PD-L1 in cells treated with the drug. Topo-1 expression was downregulated by the treatment, indicating drug-target engagement. Our results suggest that PD-L1 and OPN are potential molecular targets for combination therapy of colon cancer with topoisomerase inhibitors.

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Role of Neuroligin 1x in Breast Cancer
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Summer Research Program 2019, Tuskegee, AL

Neuroligin 1x (NLGN1) comes from a family of neuronal transmembrane synaptic proteins. Their functions haveeen associated with heterotypic cell adhesion. The objective of this experiment was to see the role NLGN1 had
on the epithelial-mesenchymal transition (EMT) in breast tissue. If NLGN1 is absent, or, exhibits low expression,
it hypothesized that there will be increase aggression of breast cancer cells and induction of cancer in normal breast
cells. In this experiment, four breast cell lines were used: MB-MDA 231, MCF-7, MCF-10A. All but the MCF-10A
are cancer cell lines. The cell cultures were grown in 10\% Fetal Bovine Serum (FBS) media, in a 25cm\textsuperscript{2},
high-adherence flask. Four techniques were performed for this experiment- Western Blotting, siRNASE, Flow cytometry, and
Wound-healing assay. The Western Blot and Wound- healing assay yielded satisfying results. Without the presence
of NLGN1x, cells did show an increase in migratory capabilities following an increase of ZEB1 and SNAIL1 gene
expression. The Flow cytometry did not yield expected results. NLGN1x did not seem to influence the proliferation
in the cells with NLGN1x knocked out. In conclusion, the absence of NLGN1 had an expected effect of the migratory
capabilities of the MB-MDA 231 cell line, but not in terms of proliferation. Further experiments will need to be
conducted before it is concluded that NLGN1 aids in the suppression or enhancement of cancer cells.

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Effect of Adipocyte Conditioned Culture Medium (ACCM)
on the In-Vitro Maturation (IVM) of Canine Oocytes
Chardonay Elliott, Deepa Bedi and Gemechu Wirtu
Tuskegee University, College of Veterinary Medicine Summer Research Program 2019, Tuskegee, AL

In most mammals, oocyte meiotic competence is attained prior to ovulation. However, canine oocytes are ovulated
at the germinal vesicle (GV) stage and complete maturation in the oviduct. The requirements for in vitro matura
tion (IVM) of canine oocytes are less optimized as compared to those of other domestic animals. Our objective was
to determine the effect of ACCM on the IVM rate. Canine ovaries (n = 40) were collected from a spay and neuter
clinic. Oocytes (n = 200) were recovered by slicing ovaries in HEPES-buffered Medium 199 and subjected to IVM
at 38.5o C for 72h in high humidity with 5\% CO2. Two treatments were compared #1 (Standard IVM medium)
containing TCM199 supplemented with 10\% fetal bovine serum, hCG and eCG and Penistrep/Antimycotic, #2
(AACM) supplemented with Penistrep/Antimycotic. At 72h, cumulus layers fixed in 4\% formalin and stained with
Hoechst 33342, rinsed in PBS and mounted on slides. Chromatin configuration was assigned into seven categories
according to Lee et al. 2008: GV I through V, unidentifiable and degenerated (GVI-V and UID, D). Statistical anal
ysis was done using SigmaPlot Version 11.0. There was no difference in the proportion of oocytes with different chro
matin status within or between treatments. In treatment 1, the respective chromatin structure and their percentages
were GV-I 17\%, GV-II 17\%, GV-III 14\%, GV-IV 9\%, GV-V 12\%, UID 23\%, D 8\%. In treatment 2, the respective
chromatin structure and their percentages were GV-I 20\%, GV-II 13\%, GV-III 18\%, GV-IV 7\%, GV-V 11\%, UID
20\%, D 11\%. In conclusion, the distribution of chromatin status was not affected by the treatments. Further studies
are recommended to identify factors that affect canine oocyte maturation.

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Effects of Bacterial Toxins on Release of Extracellular vesicles
Gabrielle Gonzales, Nadia Al-Atoom, Toufic Nashar
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Extracellular vesicles (EVs) which include exosomes and microvesicles, are nanometer to micrometer size membrane vesicles known to act as protein, lipid, and nucleic acid cargo for cell-to-cell communication. We previously found that a class of bacterial toxins (E. coli heat-labile enterotoxins, LT-1) caused a delay in antigen uptake and presentation by B cells, by an unclear mechanism. Here, we hypothesize that LT-1 toxin and its non-toxic B subunit (LT-1B) act on release and content of extracellular vesicles (EVs) from B cells. Effects of the toxins were also compared to those from colon cancer cells, known to actively release EVs. A20 mouse B cells and SW620 colon cancer cells were cultured with optimized ratio of cell number to biologically active doses of LT-1, LT-1B, and lipopolysaccharides (LPS control), or left untreated. Examination of the cells after incubation under light microscopy showed presence of numerous cell clusters in treated cells. Analysis of EVs from precipitated B cell culture supernatants revealed 50% and 25% reduction in EVs protein concentration, for LT-1B and LT-1, respectively, compared to LPS and untreated cells. Purified EVs (exosomes) did not contain proteins in treated cultures compared to untreated control. On the other hand, in SW620 cancer cells, LT-1B reduced proteins content in EVs by 31%, and those in exosomes by 67%, compared to those in untreated control. These results indicate significant inhibitory effects of LT-1 and LT-1B on cell clustering and protein contents of EVs, thus limiting cell-to-cell communication, perhaps giving advantage to bacterial spread.

Research Support: DHHS HRSA COE Grant # D34HP00001; NIH/SRE 5T35OD010432; RCMI core facility grant # U54MD007585

Expression and Localization of Microvillar-Enriched Proteins in Proximal Tubules of Renal Cystogenesis Models
Angela Irizarry-Alfonzo, Bradley K. Yoder and Pawan Puri

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In polycystic kidney disease (PKD) fluid-filled cysts and fibrosis replace renal parenchyma and that can lead to renal failure. Epithelial dedifferentiation, characterized by loss of microvilli, contributes to cystogenesis. However, molecular features and mechanisms regulating dedifferentiation are unclear. We previously showed in cystic kidney disease (CKD) mouse models that dedifferentiated proximal tubule (PT) cysts show ectopic cAMP/p-Creb signaling. cAMP signaling regulates microvillar proteins in enterocytes. We hypothesized that microvillar proteins will be mis-regulated in cystic dedifferentiated PTs. We examined PTs in embryonic renal explants in which cysts are induced by 8-Br-cAMP; and the Ift88 conditional mutant mice (Ift88cKO) in which Ift88, a gene involved in ciliogenesis is deleted postnatally. Induction of unilateral renal ischemia reperfusion (IR) injury in Ift88cKO mice leads to rapid cystogenesis. Co-immunofluorescence was performed to analyze microvillar-enriched proteins ezrin, Cdhr2 and clathrin. In control explants, ezrin and clathrin were highly expressed at the brush-border (BB) of PT with LTL-lektin, a BB marker. In contrast, in cystic tubules of 8-Br-cAMP-treated explants, ezrin and clathrin were reduced and mislocalized in LTL"""" PTs. In sham-operated control and Ift88cKO and control mice subjected to IR, strong ezrin, Cdhr2 and clathrin expression was observed at the BB. However, in the Ift88cKO kidney subjected to IR, expression of all three proteins was reduced and mis-localized in dedifferentiated PTs. Our data suggest aberrant expression of ezrin, Cdhr2 and clathrin as molecular features of dedifferentiated PTs that could be putative targets of mis-regulated cAMP/pCreb signaling in CKD.

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Investigating the Molecular Epidemiology of Drug Resistance in Ancylostoma Caninum, the Canine Hookworm
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The canine hookworm, *A. caninum*, is the most prevalent nematode parasite of dogs in the United States. In the past few years, many veterinarians have noted cases of recurrent hookworm infections that are unresponsive to anthelmintic treatments. A majority of these infections have been diagnosed in retired racing greyhounds, though non-greyhounds are also represented. Our lab has confirmed that the hookworms infecting many of these dogs are multiple-drug resistant (MDR) to all available anthelmintic classes in the United States. The Kaplan laboratory is testing large numbers of hookworm samples for resistance using both in vitro bioassays and deep amplicon sequencing of the isotype 1 beta-tubulin gene to measure benzimidazole (BZ) resistance-associated SNPs. We hypothesize that the greyhound samples will have high resistance-associated SNP frequencies in the beta-tubulin gene, and that this SNP will serve as a general marker for the MDR worms. The objective of this project is to measure levels of resistance-associated SNPs in the beta-tubulin gene of a large panel of hookworm samples. Hookworm eggs were isolated from samples of dog feces, and DNA extractions were then performed on the eggs. DNA samples are being sent to the University of Calgary for deep amplicon sequencing to measure the allele frequencies of SNPs in the beta-Tubulin gene. Initial results demonstrate very high SNP frequencies in the resistant hookworms; with many samples have greater than 90%. This data confirms that greyhounds are commonly infected with hookworms that are highly resistant to BZ drugs. Future research is aimed at determining the prevalence and geographic distribution of drug-resistant hookworms in the general pet dog population.

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Leukocyte Trends in Canine Patients with Pyometra
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Pyometra, a lethal bacterial infection of the uterus, is classified as open or closed depending on the cervix. Pyometra is often seen in intact bitches, usually over 4 years of age. It is partially due to a hormonal imbalance with elevated progesterone secretion. *E. coli* and *Streptococcus sp.* are bacteria commonly found in the uterus of affected bitches. The patient presents with clinical signs such as anorexia, polydipsia, vomiting, and the respiratory rate may be increased. The temperature varies from subnormal, normal to elevated, depending on the duration of illness. The abdomen is distended, the vulva enlarged with (open pyometra) or without (closed pyometra) discharge, and diarrhea is often seen. The changes seen in bloodwork of bitches with pyometra vary and may even be normal; however, leukocytosis characterized by a neutrophilia with a left-shift is common. Ironically, leukopenia may be found in animals with sepsis. A mild, normocytic, normochromic, nonregenerative anemia can also develop. The aim of this study was to investigate whether leukocyte trends occurred in dogs with pyometra.

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Bioinformatics is increasing in importance in the field of science and medicine. Sequencing the genome of various species can provide insights into various genes. *Drosophila eugracilis* is a species of fruit fly that has a genome size of 152 Mb and 7,568 contigs. The sequenced genome of *Drosophila melanogaster* was used as an ortholog for the process because it's genome has already been sequenced. Using a series of databases, the annotation of the PA isoform of gene S1P was performed. This gene has six exons and each one was annotated to determine the frame, phase, GT donor site, and the start and stop codons. Human manual annotation is important because computer annotation is not always correct and sequencing technology is always changing.

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