18th Annual Biomedical Research Symposium and 6th Annual Phi Zeta Research Day

Theme: Discovering Innovative Pathways in Translational Research

September 21, 2017
Patterson Hall Auditorium
September 21, 2017

Dear Conference Attendees:

On behalf of the faculty and staff of Tuskegee University, it is my distinct pleasure to personally welcome you to the 18th Annual Biomedical Research Symposium, and the 6th Annual Phi-Zeta Research Day.

The conference theme: "Discovering Innovative Pathways in Translational Research," is most appropriate for this occasion, as it validates the importance of the biomedical sciences and underscores the university’s resolute commitment to foster internal and external partnerships to solve the longstanding diseases and health issues that plague our society, as well as the black belt counties of Alabama and the surrounding areas.

Just as important, this joint venture highlights the significance of collaborative human and animal research initiatives and their undeniable connection to our mutual health and well-being.

We hope your participation in these strategic dialogues will recalibrate your thinking, inform your research, and lead to the development of implementation strategies that translate biomedical studies into best practices that promote health and wellness.

As someone once said, "Knowledge is power. Information is liberating. Education is the premise of progress in every society and family."

Sincerely,

Charlotte P. Morris, Ph.D.
Interim President
Welcome to the 18th Annual Biomedical Research Symposium and the 6th Annual Phi Zeta Research Day. The Symposium’s theme, “Discovering Innovative Pathways in Translational Research,” is aligned with the synergistic work of biomedical leaders in academia, government, research communities, and the private sector in shaping the future direction in advancing healthcare in the biomedical research enterprise.

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 (education and income), environmental and social hazards, and other disparities across different racial, ethnic and socioeconomic groups. The continuation of intensive efforts involving the research community and the public are essential to developing critical interventions that target closing the gap by reducing and eventually eliminating health disparities. This topic continues to be a national goal for developing a healthier nation.

This one-day 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 afternoon session 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 beginning with our Keynote speaker, Dr. Timothy Moran, Director of Behavioral and Biological Research, Global Obesity Prevention at Johns Hopkins, and Dr. Clayton Yates, Professor of Biology at Tuskegee University who is the Keynote speaker for Phi Zeta Research Day.

I extend my appreciation to the Biomedical Research Symposium Committee and Dr. Ayman Sayegh who serves as the chairperson and Dr. Teshome Yehualaeshet who serves as the chairperson of the Phi Zeta Research Committee.

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 Biomedical Research Symposium serves as another forum to promote and foster this mission. Thank you for attending and participating in the 2017 Biomedical and Phi Zeta Research Symposium.

Sincerely,

R. L. Perry, DVM, MS, DACVR Dean
September 21, 2017

On behalf of the organizing committee, I would like to welcome you to the 18th Annual Biomedical Symposium. Our theme for this year is "Discovering Innovative Pathways in Translational Research." We recognize the need for, and actively participate in, understanding the basic mechanisms that cause many animal and human diseases. The annual symposium provides a platform to raise awareness of issues linked to health disparities.

More specifically, our speakers will provide expert and current knowledge on the pathophysiology and possible treatment options for diseases such as obesity, kidney cyst formation and cancer. We are honored to have the internationally recognized obesity expert, the vice chair of the psychiatry department at Johns Hopkins School of Medicine, Dr. Timothy Moran. We are also delighted to have Drs. Lynn Norian and Pawan Puri who will provide us with their expert knowledge on the relation between obesity and cancer and kidney cyst formation respectively. In addition, the symposium will present three outstanding speakers who will provide the audience, especially veterinary students, with excellent advice on how to choose a career in industry or private practice. The talks will be followed by a round table discussion, which will allow the audience to participate.

We are very excited about the program of the symposium this year and we would like to thank all of you for your participation. The 18th Annual Biomedical Research Symposium is designed for your benefit. Please take advantage of it. We hope that you will have fun and learn.

Sincerely,

Ayman I. Sayegh, DVM
Chair, Biomedical Research Symposium
September 21, 2017

Welcome to the Sixth Phi Zeta Symposium at Tuskegee University, College of Veterinary Medicine. Annually, this society provides students with an excellent opportunity to share their summer research experience with fellow students, faculty, and guests. This year, we have a rich and a very exciting program to share with you.

The summer veterinary research scholars, as well as our graduate students, will have approximately twenty oral and poster presentations on topics ranging from clinical medicine, microbiology, cancer biology and therapy, reproductive physiology, immunology, food safety and control of food intake. This research has been funded generously by multiple funding sources including TU-CVM Centers of Excellence grants, National Institutes of Health and Boehringer Ingelheim. These grants funded twenty summer research scholars, the majority of which came from underrepresented minority populations. In addition, our students not only conducted their research at Tuskegee University but also at partner institutions/companies such as Mississippi State University, Johns Hopkins University, Stanford University, University of Georgia, Auburn University and Elanco. Furthermore, we are very excited to present to you our own Dr. Clayton Yates, Professor of Biology as the Keynote Speaker for this year. Dr. Yates will present insights on the Successes and Challenges in Veterinary Research.

Finally, we are looking forward to the future of this symposium. In her vision for the college, Dr. Ruby Perry, Dean of the College of Veterinary Medicine, Tuskegee University, has indicated her interest in making this upcoming event a one complete day event.

Again, we would like to welcome you to this event and sincerely hope that all of you will have a positive and a successful experience.

Sincerely,

Teshome Yehualaasht, DVM, Ph.D.      Toufic Nashar, DVM, Ph.D.
Co-chair                  Co-chair
# 18th Annual Biomedical Research Symposium
## and 6th Annual Phi Zeta Research Day
### Thursday, September 21, 2017
#### College of Veterinary Medicine, Patterson Hall Auditorium

**Theme:** “Discovering Innovative Pathways in Translational Research”

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<td>7:30 - 8:30 a.m.</td>
<td>Registration</td>
<td>Continental Breakfast</td>
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<td>8:30 - 8:35 a.m.</td>
<td>Greetings</td>
<td>Charlotte P. Morris, Ph.D., Interim President, Tuskegee University</td>
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<td>8:40 - 8:45 a.m.</td>
<td>Welcoming Remarks</td>
<td>Ruby L. Perry, DVM, MS, Diplomate –ACVR, Dean, College of Veterinary Medicine</td>
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<td>8:50 - 9:50 a.m.</td>
<td>Keynote Speaker – Timothy H. Moran, Ph.D., Director of Behavioral and Biological Research, Global Obesity Prevention Center at Johns Hopkins</td>
<td>Gut Peptide Satiety Signaling</td>
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<td>9:55 - 10:05 a.m.</td>
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<td>10:10 - 10:25 a.m.</td>
<td>Pawan Puri, DVM, Ph.D., Assistant Professor, Department of Biomedical Sciences, College of Veterinary Medicine</td>
<td>Potential Role of Kidney Injury and Dedifferentiation In The Pathogenesis Of Renal Cyst Formation</td>
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<td>10:30 - 11:00 a.m.</td>
<td>Invited Speaker – Lyse A. Norian, Ph.D., Associate Professor, Department of Nutrition Sciences, The University of Alabama at Birmingham</td>
<td>Improving Pre-clinical Tumor Models: Studying Obesity-Induced Alterations in Anti-tumor Immunity</td>
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<td>11:05 - 11:15 a.m.</td>
<td>Kiara Cousin, Ph.D. Student, Interdisciplinary Pathobiology, College of Veterinary Medicine</td>
<td>Antibody Specific Magnetic Bio-conjugate for the Detection of Salmonella Enteritidis in Chicken Meat</td>
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<td>11:20 - 12:30 p.m.</td>
<td>Roundtable Discussions</td>
<td>Beverly Miller, DVM, Medical Director, South GA Market, Banfield Pet Hospital</td>
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<td>Beverly Miller, DVM, Medical Director, South GA Market, Banfield Pet Hospital</td>
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<td>Jane G. Owens, DVM, PhD, Diplomate-ACVCP, Director of Companion Animal Research, Elanco Animal Health Veterinary</td>
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<td><em>Careers in the Pharmaceutical Industry</em></td>
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<td>Bonnie Barclay, DVM, MBA, Professional Services Veterinarian, Pet; Boehringer-Ingelheim Animal Health</td>
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<td><em>A Peek inside Careers in the Animal Health Industry</em></td>
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<td>12:35 - 1:30 p.m.</td>
<td>Lunch (Posters Evaluation)</td>
<td>Moderators - Co-Chairs, Teshome Yehualaeshet, DVM, PhD; Toufic Nashar, DVM, PhD.</td>
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<td>1:35 - 2:35 p.m.</td>
<td>Keynote Speaker - Clayton T. Yates, Professor, Department of Biology and Center for Cancer Research, Tuskegee University</td>
<td>Epigenetic Drivers of Prostate and Breast Cancer in African Americans</td>
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<td>2:40 - 2:55 p.m.</td>
<td>Bianca Reyes, 3rd Year Veterinary Student, College of Veterinary Medicine</td>
<td>Seizure Inhibition and Onset Site Localization by Focal Tetrodotoxin (TTX) Infusion in a Rat Model of Temporal Lobe Epilepsy</td>
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<td>2:55 – 3:10 p.m.</td>
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<td>3:10 - 3:25 p.m.</td>
<td>Alexis Howard, 2nd Year Veterinary Student, College of Veterinary Medicine</td>
<td>A Syngeneic Rat Model Allows for the Study of Osteosarcoma Metastasis in Patients with Intact Cell Lines</td>
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<td>Immune Systems</td>
<td>Imani Smith, 2nd Year Veterinary Student, College of Veterinary Medicine</td>
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<td>NMR-Based Metabolomics Profiling of Viable and Dead Foodborne Pathogens</td>
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<td>3:45 - 4:00 p.m.</td>
<td>Targeting Specific Dopaminergic Pathways with Cre-Dependent Dreadd</td>
<td>Jasmine Nolan, 3rd Year Veterinary Student, College of Veterinary Medicine</td>
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<td>4:00 - 4:15 p.m.</td>
<td>Glucocorticoid Receptor Expression is Decreased with Nuclear Localization in Airways of Pasture Asthma Horses</td>
<td>Jose P. Zayas, 2nd Year Veterinary Student, College of Veterinary Medicine</td>
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<td>4:15 - 4:30 p.m.</td>
<td>Studies to Enhance Motility of Canine Epididymal Spermatozoa (CES): Effects of Alkalinization and Secondary Messengers</td>
<td>Laurie Mang’eli, 2nd Year Veterinary Student, College of Veterinary Medicine</td>
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<td>4:30 - 4:45 p.m.</td>
<td>Student Award Presentations by Phi Zeta Team</td>
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<td>4:45 - 5:00 p.m.</td>
<td>Closing Remarks</td>
<td>Ayman I. Sayegh, DVM, Chair, Biomedical Research Symposium</td>
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Biomedical Research Symposium Keynote Speaker

Timothy H. Moran, Ph.D., Director of Behavioral and Biological Research, Global Obesity Prevention Center at Johns Hopkins

Timothy Moran is the Paul R. McHugh Professor of Motivated Behaviors, Vice Chair and Director of Research for the Department of Psychiatry and Behavioral Sciences at the Johns Hopkins University School of Medicine. He is also Director of Behavioral and Biological Research of the Johns Hopkins Global Center for Obesity Prevention at the Bloomberg School of Public Health where he has a joint appointment as Professor of International Health. Moran's research interests are in brain/behavior relationships as they apply to the controls of food intake and body weight. The work has focused on brain/gut peptides as feedback controls of meal size and how these interact with neural systems involved in overall energy balance and reward processing with a focus on how these may go awry in eating disorders and obesity. Current projects extend this work to examine how gestational and early developmental factors can bias metabolic and neural programming to contribute to obesity and the effects of exercise on diet preference and overall energy balance. Moran is a fellow of the Obesity Society where he currently serves on Council and a past president of the Society for the Study of Ingestive Behavior (SSIB). He is currently chair of the NIH Integrative Physiology of Obesity and Diabetes Study Section.

Gut Peptide Satiety Signaling

Obesity has become a worldwide epidemic now affecting both developing countries as well as western nations. A better understanding of the overall controls on eating is necessary for the development of prevention and treatment options. The presence of food and digestive products in the gastrointestinal tract modulates vagal afferent activity and the release of peptides that together provide feedback to the brain on the nature and amount of consumed nutrients. Individual gut peptides can either directly access the brain through endocrine actions, released into the blood stream interacting with receptors at brain sites involved in feeding control or stimulate local vagal afferent terminals to modulate neural inputs into the brain. Long acting gut peptide agonists are now available and can be inhibit eating across multiple meals. Finally, combination of these gut peptide agonists can exert synergistic actions and may be especially effective in reducing food intake and body weight. The combination in part mimic some of the effects of bariatric surgery and may offer a less invasive treatment option.
Pawan Puri, DVM, Ph.D., Assistant Professor, Department of Biomedical Sciences, College of Veterinary Medicine

Pawan Puri is an Assistant Professor of Physiology in the Department of Biomedical Sciences at Tuskegee University College of Veterinary Medicine. He obtained his bachelor’s degree in veterinary science and animal husbandry (BVSc & AH) (~DVM) from Punjab Agricultural University, Ludhiana, India. He received his PhD in reproductive physiology and endocrinology from Kent State University, Ohio and conducted his postdoctoral work at the University of Pittsburgh. Dr. Puri’s research focuses on signaling mechanisms regulating kidney development and renal dysplasia. He is also interested in signaling mechanisms that regulate male fertility and to determine the genetic basis of infertility. Dr. Puri has been awarded fellowships from the Lalor Foundation and Magee-Women’s Research Foundation. Dr. Puri has also received Lalor Foundation Merit Award and Paul M. Rike Fellowship Award for his research studies.

Potential Role of Kidney Injury and Dedifferentiation in the Pathogenesis of Renal Cyst Formation

Polycystic kidney disease (PKD) is characterized by fluid-filled cysts and fibrosis that replace the renal parenchyma, leading to end-stage kidney disease for which there are no cures. Although a genetic mutation is considered to be the primary event initiating cystogenesis however, secondary non-genetic factors such as renal injury and its-associated maladaptive de-differentiation and repair program are known to influence the rate and severity of cystogenesis. The identity and precise role of signaling networks implicated in renal injury and repair that also aggravate cystogenesis are not well defined. A better understanding of these aberrant signaling mechanisms that exacerbate renal cyst progression may enable the design of rational therapeutic interventions to retard cyst growth. This presentation will focus on the identification and role of novel signaling pathways implicated in acute kidney injury and dedifferentiation in the pathogenesis of cystogenesis.
Biomedical Research Symposium Invited Speaker

Lyse A. Norian, Ph.D., Associate Professor, Department of Nutrition Sciences, The University of Alabama at Birmingham

Lyse A. Norian is an Associate Professor in the Department of Nutrition Sciences at the University of Alabama at Birmingham. Prior to joining UAB, Norian did her post-doctoral research at the Washington University School of Medicine, where she studied suppressive tumor-infiltrating dendritic cells, then worked at The University of Iowa, where she began to study immune responses to orthotopic renal tumors in the presence or absence of obesity. Norian’s research is focused on three main areas: 1) defining the mechanisms of tumor-induced immune dysfunction; 2) understanding how co-morbidities such as obesity alter the quality and magnitude of anti-tumor immune responses; and 3) translating this knowledge into the development of novel, more highly efficacious immunotherapies for solid tumors. Her work in the area of obesity and anti-tumor immunity has led to multiple key findings that are the basis for her current research focus: 1) obesity decreases the stimulatory capacity of splenic dendritic cells, even in the absence of tumor growth; 2) obesity is associated with a heightened accumulation of immunosuppressive myeloid-lineage cells in renal tumors; 3) obesity decreases CD8+ effector T cell anti-tumor responses; and 4) obesity decreases the overall efficacy of immunotherapy for renal tumors, leading to progressive and fatal tumor outgrowth.

Studying Obesity-Induced Alterations in Anti-Tumor Immunity

There is a long-standing disconnect between results obtained in pre-clinical tumor therapy studies and the efficacy of those same therapies once they are translated into the clinic. Numerous therapies that have worked well in mice have shown far less efficacy in the clinic. One contributing factor may be the lack of co-morbidities present in most pre-clinical murine tumor models. Currently in the U.S., nearly two-thirds of adults are overweight or obese, and obesity is known to increase the risk of developing 13 different types of cancer. Despite this, nearly all pre-clinical murine tumor therapy studies are performed in young, lean mice. The Norian lab has begun to evaluate the effects of obesity as a co-morbidity in pre-clinical murine tumor models and human cancer subjects. Specifically, we are studying the ways in which obesity impacts anti-tumor immunity and the efficacy of cancer immunotherapy, a treatment approach that is gaining widespread clinical use.
Biomedical Research Symposium Speaker

Kiara C. Cousin, MS, Interdisciplinary Pathobiology, Ph.D. Student, College of Veterinary Medicine, Tuskegee University

Kiara Cousin is a doctoral student in the Interdisciplinary Pathobiology (IDPB) program at Tuskegee University. She completed her B.S. in Biology from Dillard University in 2009 and her M.S. in Tropical Animal Health from Tuskegee University in 2013. Ms. Cousin has worked for the USDA Aquatic Animal Health Research Unit from 2013-2015 assisting with research involving bacterial fish diseases and vaccine development. Her current research focuses on pathogen identification in contaminated foods using nanomaterials.

Antibody Specific Magnetic Bio-conjugate for the Detection of Salmonella Enteritidis in Chicken Meat

An estimated one in six Americans become ill by consuming foods or beverages contaminated by disease causing pathogens each year. The World Health Organization (WHO) has shown statistics of tens of millions of new human cases and more than 100,000 deaths every year from individuals with symptoms ranging from fever, abdominal pain, diarrhea, nausea, and vomiting. Foodborne diseases have become a significant public health concern throughout the globe with an increase in incidence over the last two decades. Techniques for rapid detection of such contaminants are of significance in warranting food safety. While most identification techniques have been deemed laborious and time consuming, nanotechnology provides innovative ways designing biosensors for specific targeting and rapid detection of foodborne pathogens. In this study, we designed a Salmonella specific bio-conjugate to capture Salmonella enterica serovar Enteritidis in situ using magnetic nanoparticles (MNPs) conjugated with crosslinking agents and a universal anti-Salmonella antibody. This biosensor (Ab-CMNP) was tested in bacterial suspension and in uncooked chicken meat samples. The Ab-CMNP was characterized using hyperspectral imaging (HSI) microscopy and transmission electron microscopy (TEM). The effectiveness of Ab-CMNP was determined by magnetic separation of the Salmonella captured bio conjugate and subsequent inoculation on XLT4 agar plates. The preliminary results suggest successful conjugation of the MNPs and capturing of bacteria in non-food and food substrates in situ. Further work is ongoing to determine the effectiveness of Ab-CMNP's in other food substrates.
Biomedical Research Symposium Roundtable Speakers

Beverly Miller, DVM, Medical Director, South GA Market, Banfield Pet Hospital

Beverly Miller is a 2005 Tuskegee University Veterinary College graduate of 2005. She currently resides in Atlanta Georgia and serve as the Medical Director for South Georgia market of Banfield Pet Hospitals. In this role, she supports 18 veterinary hospital teams regarding maintaining and promoting high standards of Medical Quality and continual learning and growing of each of our doctors. Dr. Miller’s passion is to see every one of her doctors and para associates strive daily to be their best and understand they are a part of something large and exciting being a part of the veterinary medicine profession is what motivates her daily in her role. She loves seeing doctors grow, not only in medical knowledge, but in the fluency of client communication and engaging and growing their teams.

Presentation: Opportunities at Banfield and why we should be considered for their career home or starting place.

Jane G. Owens, DVM, Ph.D., Diplomate ACVCP, Director of Companion Animal Research, Elanco Animal Health Veterinary

Jane G. Owens received a B.S. in Animal Science from the University of Kentucky and her DVM from Tuskegee University, School of Veterinary Medicine. She completed her Doctoral training in Equine Pharmacology at the Department of Veterinary Physiology, Pharmacology and Toxicology at Louisiana State University. She completed a Post-Doctoral Fellowship at the Chemical Industry Institute of Toxicology, Research Triangle Park, North Carolina.

Dr. Owens has worked in the Animal Health Pharmaceutical industry for over 20 years to discover, develop and register new drugs for all veterinary species. While at Pfizer Animal Health, she was responsible for a team of scientists dedicated to understanding the pharmacokinetics, drug metabolism and food animal drug residues of new animal health products. At ELANCO Animal Health she has led teams to develop novel drugs for companion animals, equine and food animals. Dr. Owens is board certified by the American College of Veterinary Clinical Pharmacology and is the Past President of the American Academy of Veterinary Pharmacology and Therapeutics. She also serves as President and founding member of the Veterinary Pharmacology Research Foundation. Dr. Owens is an active participant on American Veterinary Medical Association committees and is the past chair of the Council on Biologic and Therapeutic Agents.

Presentation: Careers in the Pharmaceutical Industry

TVSM has a long history of training veterinarians for diverse career choices and has one of the highest percentage of graduates in non-practice careers. The pharmaceutical industry holds many career options for veterinarians both in companies devoted to human and animal health products. Career options span the phases of drug development and commercialization from scientists in Research and Development (R&D) divisions to technical service veterinarians who interact with practitioners after product launch. Positions in R&D include Research Scientists, Animal Welfare Officers, Toxicologists, Pathologists, Pharmacologists, Clinical Scientists and Regulatory Scientists. These positions often require advanced degrees or board certification. Commercial positions for veterinarians in Animal Health companies include positions in sales, marketing and technical service where practice experience is considered very important owing to the close interaction with practicing veterinarians. Veterinary students often ask how to gain more information about jobs in this industry. Among the various ways to gain further understanding, summer internships within the pharmaceutical industry are an ideal way for students to gain first-hand knowledge of working in the field. Most major companies have summer internships and the optimum time to participate are between the 1st and 2nd year or the 2nd and 3rd years. These internships are often advertised on company websites in the fall or spring. Companies often look at these internships as recruiting tools for full time eventual full time positions. Often, positions in industry are found by networking with colleagues holding positions in companies. Tools such as LinkedIn can be very useful in searching for jobs in this industry.
Bonnie Barclay joined Boehringer Ingelheim in 2009 and offers 25+ years of comprehensive experience in Animal Health which includes 13+ years of equine, canine, and feline clinical expertise. Over the past 15+ years, she has trained 1,000+ territory managers, veterinarians, and distributor representatives. Dr. Barclay’s notable career achievements include her involvement as the business development lead in the Pfizer/Wyeth merger; nomination as Chairperson for the Wyeth Diversity Council; and her role as a member of the Dean’s Advisory Board for Tuskegee University School (now College) of Veterinary Medicine. Due to the breadth of her industry and clinical experience, Dr. Barclay is recognized for her expertise in various topics including infectious diseases, vaccinology, parasitology, heartworm disease, pain management, cardiology and diabetes. She is a seasoned speaker and has lectured at numerous veterinary engagements and conferences with up to 500 attendees. Dr. Barclay’s area of responsibility is Northwest Florida from North Tampa south to Marco Island.

Dr. Bonnie Barclay has a BS in Zoology from Howard University in Washington, D.C., and a BS in Animal Science from Tuskegee University where she also completed her DVM. After completing her DVM, Dr. Barclay achieved her MBA and is additionally a Silver Certified Low Stress Free Handling Professional and a Fear Free Certified Speaker.

A Peek inside Careers in the Animal Health Industry

Get a look behind the curtain at what it’s like to work as a DVM in the Animal Health industry. The opportunities may be broader than you’ve imagined. Have you ever wondered what it takes to develop a new pharmaceutical or a vaccine for veterinary use or how the industry works with regulatory agencies worldwide to ensure the safety and efficacy of products? Are you curious about the cutting edge science that supports new projects going through an R&D pipeline? Did you know that partnerships between academia and industry are essential to bring new innovations into the market? And what about selling and supporting that product once it is launched? The panel will discuss the many “hats” that a DVM can wear when working in an Industry setting and provide an insider’s look at the Animal Health industry. Bring your questions; we’d like this to be a very interactive session.
Phi Zeta Keynote Speaker

Clayton T. Yates, Ph.D., Professor, Department of Biology and Center for Cancer Research, Tuskegee University

Research Interest: Epigenetic Alterations that Contribute to Aggressive Cancers in African American patients.

Clayton Yates is a Professor in the Department of Biology and holds a joint appoint in the Center for Cancer Research and Materials Science and Engineering at Tuskegee University. Before joining Tuskegee University, Yates completed his graduate training in the Department of Pathology at the University of Pittsburgh School of Medicine. He then completed his postdoctoral training in the Department of Urology, at Emory University School of Medicine.

Yates has an interest in prostate and breast cancer research, particularly in African Americans. He has established several cell line based models derived from African American patients that are used by many labs today to study molecular events leading to prostate cancer development and metastasis. Additionally, he has identified multiple biomarkers for the prediction of aggressive cancers in African Americans with prostate or breast cancer. This has led to development of a novel therapeutic agent that is posed to enter clinical trials in 2018.

Yates has spoken at over 35 universities and conferences including the 1st NCI Health Disparities Conference. Recently he has been invited to deliver the AACR Distinguished Lecture at Howard University. He has received numerous research honors and awards, authored over 50 peer-reviewed publications, participated in numerous Department of Defense and NIH study section panels, and received numerous DOD and R level NIH grants in the area of prostate and breast cancer health disparities. Yates is currently the PI of Research Centers at Minority Institutions (RCMI), site PI of CTSA (jointly with UAB), and co-PI of U54 Cancer Health Disparities with Morehouse School of Medical and University of Alabama at Birmingham.
Intact Immune Systems


Tuskegee University College of Veterinary Medicine, Tuskegee, Alabama (Howard), Department of Molecular and Comparative Pathobiology (Guo, Sysa-Shah, Kissel, Braxton, France, Gabrielson) and Department of Radiology (Raman, Vesuna), Johns Hopkins University School of Medicine, Baltimore, Maryland.

Osteosarcoma is the most common bone cancer in children and teens. In approximately 20% of these patients, metastasis has already occurred before tumor diagnosis. In order to better understand factors that determine metastasis, the development of an animal model that closely replicates the events that take place in these patients is critical. Many animal models use immunocompromised mice to grow human osteosarcoma. Here, we established an osteosarcoma Sprague Dawley (SD) rat model with an intact immune system. Juvenile Sprague Dawley (SD) rats were implanted with rat osteosarcoma cell line UMR-106, originally isolated from a SD rat. We transfected UMR-106 cells with Td Tomato red fluorescent protein, allowing metastases to be identified with in vivo imaging. Using aseptic technique, a needle was used to make a small hole in the tibial plateau of three-week old rat pups. The UMR-106 cells were injected into the diaphysis through this opening using a Hamilton syringe. Significant tumor formation in the injected tibias was observed within three weeks by CT scans and IVIS optical fluorescence imaging. When the pups reached six weeks of age, the hind limbs with the primary tumor were amputated and examined histologically for osteosarcoma. Metastasis was evaluated in a time course experiment. In parallel to the in vivo experiments, western blots from lysates of UMR-106 cells demonstrated the expression of ErbB2 and EGFR proteins, allowing for future therapies using tyrosine kinase inhibitors. This will allow us to also investigate immunotherapy treatment for osteosarcoma.

Research Grant: American Heart Association Grant and Charles River Laboratories

Seizure Inhibition and Onset Site Localization by Focal Tetrodotoxin (TTX) Infusion in a Rat Model of Temporal Lobe Epilepsy

Bianca Reyes1,2, Paul S. Buckmaster2,3

1College of Veterinary Medicine, Tuskegee University, Tuskegee, AL. Departments of 2Comparative Medicine and 3Neurology and Neurological Sciences, School of Medicine, Stanford University, Stanford, CA.

Temporal lobe epilepsy is common in humans. Seizures usually start in the hippocampus. To test mechanisms of ictogenesis and develop more precise treatments, it would help to localize seizure onset sites in animal models. We hypothesized that inhibiting a focal region of the hippocampus in epileptic pilocarpine-treated rats would prevent seizures. Rats were surgically implanted with cannulae directed to the ventral hippocampus attached to subcutaneous mini-osmotic pumps to continuously infuse TTX to block action potentials or saline. Local field potential (LFP) recording electrodes (32/rat) were implanted in brain regions where seizures might start: septum, amygdala, olfactory cortex, dorsal and ventral hippocampus, and entorhinal cortex. Rats (n=4) were monitored for spontaneous seizures at least 9 h/day for weeks. Results were analyzed while blinded to electrode locations and periods of TTX infusion. 288-515 spontaneous seizures were recorded/rat. In one rat, during saline infusion, seizure frequency was 0.96 ± 0.15 per hour, earliest electrographic seizure activity was recorded first in the left ventral hippocampus in 80% of seizures, and average peak LFP amplitude in the left ventral hippocampus during slow wave sleep was 5.2 ± 0.2 mV (mean ± sem). Focal infusion of TTX into the left ventral hippocampus reduced average peak LFP amplitude to 35% of baseline (p<0.001, t test) indicating focal inhibition. While LFP amplitude was focally suppressed, seizure frequency was reduced to 13% of baseline (p<0.001). LFP amplitude and seizure frequency returned to baseline levels after TTX infusion stopped. These findings reveal that onset sites can be identified and seizures can be blocked by focal inhibition.

R01 NS040276 NIH/NINDS - Ictogenesis in a model of temporal lobe epilepsy
T35 OD010989 NIH/Office of the Director - Research opportunities in comparative medicine.

NMR-Based Metabolomics Profiling of Viable and Dead Foodborne Pathogens

Imani Smith1, Brandon R. Gines1, Willard E. Collier2, Mohamed A. Abdalla2, Teshome Yehualaeshet1

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The incidence of foodborne diseases has increased over the years and become major global public health problem. To develop and promote a reliable prevention and control of foodborne diseases, the developments of reliable protocols for the detection of only viable bacteria are critical. The objective of this study was to explore the potential of global metabolomics profiling to differentiate viable and dead bacteria. In this experiment, viable and dead (by heat or alcohol) Escherichia coli and Staphylococcus aureus were subjected to 1H-NMR (nuclear magnetic resonance) -based global metabolic analysis. After extraction of the intracellular and extracellular metabolites, metabolic...
This lack of an understanding of the disease leads to a challenge in treating the extrapyramidal symptoms caused by the conventional antipsychotic drugs. There is a need to develop an antipsychotic treatment that can target the excess dopamine neurotransmission in the mesoaccumbens pathway, and enhance the mesocortical pathway without affecting the nigrostriatal pathway. In order to develop this type of beneficial treatment, we need to understand how gene expression is impacted in dopamine neurons from the use of antipsychotics. Therefore, our goal was to investigate the feasibility of using a combination of a Cre-dependent adeno-associated viral vectors expressing DREADDS (Designer Receptors Exclusively Activated by Designer Drugs) in combination with the retrogradely transported herpes simplex viral vector expressing Cre into either the prefrontal cortex, nucleus accumbens, or substantia nigra to target these distinct pathways to inhibit or stimulate them. Our data indicates that AAV can infect dopamine neurons and that HSV is retrogradely transported in neurons. Additionally, we found that DREADDs can be expressed in specific dopamine neurons, based on efferent innervation, can be achieved by using AAV and HSV. One caveat to this approach is that only a small subset of dopamine neurons were labeled by this method. Future studies will investigate molecular changes that result from altering activation of these dopamine neuron populations in ways that mimic what occurs in patients with schizophrenia.

Targeting Specific Dopaminergic Pathways with Cre-Dependent DREADds

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Schizophrenia remains to be a poorly understood and complicated disease that alters the CNS by affecting the mesocortical, mesolimbic and nigrostriatal dopaminergic pathways.
responsive to glucocorticoid administration without removal from inciting environmental factors. This project was supported by Agriculture and Food Research Initiative (AFRI) Animal Health Program competitive grant no. 2015-67016-23172 from the USDA - National Institute of Food and Agriculture.

Studies to Enhance Motility of Canine Epididymal Spermatozoa (CES): Effects of Alkalization and Secondary Messengers

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Testicular and proximal epididymal spermatozoa are immotile. Maturation of spermatozoa including progressive motility are acquired during sperm transit through the epididymis. The mechanisms that regulate these changes in motility are not fully characterized; however, some factors including low pH, low sperm membrane fluidity, and differential phosphorylation of certain sperm proteins have been described. Our objective was to evaluate the effects of an alkalinizing solution-Glutamate-Tris reactivation medium (GRM), and secondary messengers- (Ca\(^2+\), cAMP) and ATP on the motility of caput, corpus and cauda spermatozoa. Spermatozoa were extracted from the caput, corpus and cauda of the epididymis and suspended in HEPES-buffered Tyrode’s solution supplemented with lactated (TL-Hepes). After washing off seminal plasma, cells were sequentially exposed to GRM, Ca\(^2+\), ATP and cAMP. Corpus and cauda but not caput sperm motility was affected by the treatments. GRM, and Ca\(^2+\) in combination with GRM increased motility. ATP and cAMP did not affect motility. The treatments increased corpus sperm motility much more than that of cauda sperm. In conclusion, corpus and cauda sperm motility was differentially affected by the treatments. Additional methods or modifications are required to initiate caput sperm motility.

Research Grant: Tuskegee Veterinary Scholar Program, USDA/NIFA Grant#2015-38821-2437

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Phi Zeta Poster Abstracts

**Novel Approach for the Control of ZIKA Virus by E-Protein Binding Peptides**

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Control of ZIKA virus (ZIKAV) infection is currently one of the most pressing issues worldwide. ZIKA virus is a single-stranded RNA virus of the Flaviviridae family transmitted mainly by mosquitoes, but also from pregnant women to their newborn, and by sexual transmission. Current efforts focus on the development of a vaccine that can protect individuals against infection, particularly pregnant women, due to the associated risk of microcephaly in the newborn and occasionally severe neurological symptoms. However, there remains a number of challenges to produce a vaccine particularly in areas endemic of other viruses from the same family.

The use of an anti-viral strategy based on peptides to block ZIKAV entry into the cell may overcome such challenges. Here we explored a novel approach aiming at generation of phage clones that bind to ZIKA virus (ZIKAV) surface-exposed E protein, by using phage display combinatorial peptide library. We demonstrate generation of phage clones following three rounds of surface panning with titrated phages. Bound phages to ZIKAV E protein were eluted and amplified in *E. coli*. Although preliminary, isolation of these clones is a major step knowing the technical challenges associated with this procedure. Further work will select the phages that display peptides with the highest affinity to the E-protein, determine consensus peptides, and evaluate their efficacy against ZIKAV infection in human cell lines.

**CVM Start-up research funds**

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**Evaluating the Role of Transcriptional Factor Kaiso in HIV Infection**

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The highest percentage of (human immunodeficiency virus) HIV infections occur in African Americans as compared to other races. In addition, people infected with HIV are at high risk for several other types of cancers. For example, people infected with HIV are more likely to be diagnosed with Kaposi sarcoma, and among women, at least five times more likely to be diagnosed with cervical cancer with poor treatment outcome. Kaiso has been described as a methyl CpG-binding domain (MBD)
Environmental conditions have an individual’s health and productivity. While heat stress indices have been formulated for humans and a few species of animals, there is little to no research that explores a specific index for dogs. The purpose of this project was to determine what factors should be considered in a heat stress index for dogs and what additional behavioral and lifestyle factors predispose dogs to increased heat exposure. It was expected that certain factors such as urban vs. rural setting, body condition, activity level, and owner characteristics predispose dogs to increased heat exposure. 30 dog owners were recruited from urban Birmingham, AL and rural Wilcox County, Alabama. Participants were asked to complete questionnaires dealing with their personal demographics and additional questionnaires dealing with the signalment, behavior, and lifestyle of their dogs. The dog owners and their participating dogs wore iButton temperature monitors continuously for 6 days. The iButton monitors recorded the air temperature surrounding the participants every 5 minutes. The average daily and nightly temperatures experienced by the participants were compared using the factors contained in the questionnaires.

Research Grant: Ministry of Higher Education and Scientific Research, Baghdad, Iraq
Student Support: Ministry of Higher Education and Scientific Research, Iraq, and Tuskegee University, College of Veterinary Medicine

Cholecystokinin-58 Increases Fos-Like Immunoreactivity in The Enteric Nervous System and the Dorsal Vagal Complex

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Introduction: Cholecystokinin–58 (CCK-58) is a gastrointestinal peptide secreted by the endocrine cells, acting on the CCK1 and CCK2 receptors, to reduce food intake, inhibit gastric emptying and contract or relax smooth muscle cells.

Objective: To determine the activation of the gastrointestinal and dorsal vagal complex (DVC) neurons by intrarterial (aorta) infusion of CCK-58.

Material and Methods: Animals were divided into two groups (n=5 per group). Group 1 received an infusion of CCK-58 (5nmol/kg) and group 2 received an infusion of saline (0.5ml). Results: Neuronal activation was measured, in the small intestines (myenteric and submucosal plexus of the duodenum, jejunum, and ileum) and DVC, in response the infusion of CCK-58.

Research Grant: ISCIDK094972-01A1
Student Support: COE, Tuskegee University, College of Veterinary Medicine

Production and Characterization of Recombinant LipL32 and LipL21 Proteins from Leptospira for the Development of Vaccine against Leptospirosis

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Leptospirosis is one of the most important bacterial zoonotic diseases and public health problem in animals and humans throughout the world. It is caused by pathogenic bacteria belonging to the genus Leptospira. Chronically infected reservoir host animals shed Leptospires into the environment through their urine. Contact with contaminated soil or water results in large numbers of Leptospira infections both in animals and humans. Every year, more than 500,000 cases of severe leptospirosis are reported. It is also an economically important disease affecting most of domestic and non-domestic animals causing abortion, stillbirth, infertility, decreased milk production, and death.
Current killed vaccines lack long-term protection and are mostly serovar-specific. Hence, there is an urgent need for a vaccine that can afford long-term and broad protection against the many existing Leptospira serovars. LipL32 and LipL21 are the most important conserved lipoproteins among pathogenic Leptospira. We have successfully amplified and cloned LipL32 and LipL21 in E.coli by using the Gateway cloning system. Plasmids encoding for each of the proteins were sequenced to verify fidelity of the sequence and position of the inserts. The nucleotide sequences were tagged with histidine for ease of protein purification using metal-affinity columns. Expression of the proteins was verified by SDS-PAGE and Western Blot. Currently we are generating and producing recombinant proteins of LipL32 and LipL21 that could be used for subunit vaccines to protect animals and human against a wide array of Leptospriosis. These recombinant proteins could eventually be useful in the diagnostics of Leptospirosis in the early phases of infection using in-vitro assays such as Western Blot.

Research Grant: Ministry of Higher Education and Scientific Research, Baghdad, Iraq

Student Support: Ministry of Higher Education and Scientific Research, Iraq, and Tuskegee University, College of Veterinary Medicine

1H-Nuclear Magnetic Resonance-based Metabolomics Characterization of Curcumin Against E. coli
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Natural products have been rich source of compounds for drug discovery and have provided the starting points for most of the major classes of antibiotics. Curcumin, a constituent of the traditional medicine Tumeric, is known to possess multiple therapeutic properties, including antimicrobial activity. While multiple reports have been published to identify cellular targets of these compounds, the mechanism of how these natural products affect the metabolism is not well understood. Metabolomics is the simultaneous study of all the metabolites in biological fluids, cells, and tissues detected by high throughput technology. Therefore, this study sought to determine if 1H-NMR metabolomics analysis of cell extracts can be used to compare and quantify the changes of the intracellular metabolome of Escherichia coli in response to curcumin exposure. 16 intracellular metabolites were identified as having been impacted after curcumin treatment. Amino acid pathways including branched chain amino acids, glycine, serine, threonine, alanine, aspartate, glutamate, arginine, and glutamine were found to be impacted upon treatment. Additionally, glutathione metabolism – a target of curcumin in human bronchial epithelial cells - is impacted according to the pathway analysis. Additional work is necessary for a more comprehensive study of metabolic changes, which would allow us to compare a greater number of metabolites and thus metabolic pathways. However, from this preliminary study, the results provide valuable insight into the antimicrobial properties of curcumin.

Grant source: 1 Nmr: NSF MRI CHE 1427568 Core lab: RCMI G12MD00758523

LT-IIa Enterotoxin and Anti-Cancer Drug Significantly Reduce Number of Colon Cancer Cells in Vitro
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Colon cancer is the #2 killer in the United States among people over the age of 50. The disease emerges as benign polyps in the intestine, which may become malignant. There are various modes of treatments regarding colon cancer including surgery, chemotherapy, and radiation therapy. A common anti-cancer drug 5-fluorouracil (5-FU) is used to treat colon cancer, breast cancer, and rectal cancer. Due to their binding to ubiquitous receptors on mammalian cells, and signaling, heat-labile E. coli enterotoxins may have an important role in the treatment of this disease. In particular, LT-IIa is a derivative that has several biological properties, including its ability to activate or cause cell death in certain cells. We investigated effects of LT-IIa on SW620 colon cancer cells with or without LT-IIa. We demonstrate that LT-IIa either alone or in combination with 5-FU is able to significantly reduce the number of viable cells in culture. However, despite that the cells were propidium iodide positive (increased membrane permeability) there was no evidence of the cells undergoing early or late cell death as demonstrated by staining cells with Annexin V, and staining DNA with propidium iodide, respectively. This suggests that the reduced number of colon cancer cells was due to events independent of apoptosis. Preliminary data in our laboratory indicated that inhibition of cell proliferation might have caused the reduction in the number of cells in culture. It is also possible, that LT-IIa induced receptor-mediated signals that altered proliferation (arrest) of these cells. Further experiments will be performed to confirm effects of LT-IIa with or without 5-FU on these cells.

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Combined Gastrin Releasing Peptide-29 and Glucagon Like Peptide-1 Reduce Body Weight in Diet-Induced Obese Male Rats More than Each of the Peptides Given Individually
Glucagon-like peptide-1 (GLP-1) is a gut-brain peptide secreted by L-cells of the gastrointestinal tract and plays an important role in the regulation of food intake. The goal of this work was to explore possible neuronal pathways by which GLP-1 reduces food intake through quantifying Fos-like immunoreactivity (Fos-LI, a marker for neuronal activation) in the enteric nervous system (the myenteric and submucosal plexuses) of the gut and the areas of the dorsal vagal complex (DVC) of the hindbrain that regulates food intake. Ten male Sprague Dawley rats were food deprived overnight and given GLP-1 or saline through the aorta and Fos-LI was quantified in the myenteric and submucosal plexuses of the small intestines (duodenum, jejunum and ileum) and the DVC. Based on previous work with a synthetic analogue of GLP-1, exenatide, given intraperitoneally. In conclusion, GLP-1 may reduce food intake by activating myenteric and submucosal neurons, which in turn activate the DVC through a vagal or a sympathetic pathway.

Research Grant: NIH SC1 Grant

Identification of CPT Treated Colon Cancer Cells with Phage Display

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The purpose of phage display is to choose a specific peptide from phage particles that will bind to the desired target. Proteins, peptides, or a piece of DNA could be the target. Phage display offers great advantage as a high throughput profiling technology based on peptide libraries on the surface of bacteriophage. Selective binding of phage from library with billions of diversified peptides can make a clear distinction between two morphological same but functionally different targets and thus offers a complementary approach for comparative screening. Filamentous phage M13 is a common vector used to build the display. Phages are selected from a phage library to bind to their specific target using a selection protocol. In this study, we have aimed to select and identify phages that can recognize CPT-treated colon cancer cells in comparison to non-treated colon cancer cells. Camptothecin, CPT, is a plant extract that is being used as a hemotherapeutic agent against cancer. CPT works by inhibiting the enzyme topoisomerase that plays a part in the DNA synthesis. Specifically, the CPT will cause cytotoxicity by preventing re-ligation. Colon cancer has emerged as the second leading cause of death by cancer. The theory of phage display used amongst CPT treated cells is a biomarker that will show the difference in expression before and after treatment. It is beneficial to be able to see an expression after the treatment because it will show which cells respond to the chemotherapy. Phage binding assay is conducted to determine which phages have the strongest affinity to the colon cancer cells that have been treated with the CPT. This experiment is done by exposing CPT treated and non-treated cells to a combination of E. Coli bacteria and selected M13 phages then plating them on an agar plate. The amount of binding of the CPT treated cells to the phage is compared to the amount of binding of the non-treated cells to the same phages. Theoretically, results should show that CPT treated cells respond to the chemotherapy. With phage display technique, there have been many medical advances such as vaccine development, drug design, therapeutic targeting, and much more. Specifically, with therapeutic targeting, phage display allows for the diagnosis and identification of tumor antigens which furthers aids in cancer research.

Funding source: This study was funded by S5C2CA211028 - 02 PI Name: Bedi, Deepa
**Biomedical Research Symposium Poster Abstracts**

**Neuroligin 4X Overexpression in Human Breast Cancer is Associated with Poor Relapse-Free Survival**

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The molecular mechanisms involved in breast cancer progression and metastasis still remain unclear to date. It is a heterogeneous disease featuring several different phenotypes with consistently different biological characteristics. Neuroligins are neural cell adhesion molecules that have been implicated in heterotopic cell adhesion. In humans, alterations in neuroligin genes are implicated in autism and other cognitive diseases. Until recently neuroligins have been shown to be abundantly expressed in blood vessels and also play a role implicated in the growth of glioma cells. In this study we reported increased expression of neuroligin 4X (NLGN4X) in breast cancer. We found NLGN4X was abundantly expressed in breast cancer tissues. NLGN4X expression data for all breast cancer cell lines in the Cancer Cell Line Encyclopedia (CCLE) was analyzed. Correlation between NLGN4X levels and clinic pathologic parameters were analyzed within Oncomine datasets. Evaluation of these bioinformatic datasets results revealed that NLGN4X expression was higher in triple negative breast cancer cells, particularly the basal subtype, and tissues versus non-triple-negative sets. Its level was also observed to be higher in metastatic tissues. RT-PCR, flow cytometry and immunofluorescence study of MDA-MB-231 and MCF-7 breast cancer cells validated that NLGN4X was increased in MDA-MB-231. Knockdown of NLGN4X expression by siRNA decreased cell proliferation and migration significantly in MDA-MB-231 breast cancer cells. NLGN4X knockdown in MDA-MB-231 cells resulted in induction of apoptosis as determined by annexin staining, elevated caspase 3/7 and cleaved PARP by flow cytometry. High NLGN4X expression highly correlated with decrease in relapse free-survival in TNBC. NLGN4X might represent novel biomarkers and therapeutic targets for breast cancer. Inhibition of NLGN4X may be a new target for the prevention and treatment of breast cancer.

**Research Grant:** National Institutes of Health- 5 SC2 CA211028-02 (Deepa Bedi M.D., Ph.D.)

**Student Support:** Integrative Biosciences PhD Program

**Survveillance and Characterization of Equine Hepaciviridae in East Alabama Herds**


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Hepatitis C Virus (HCV) is estimated to have infected 170 million people worldwide. Certain genotypes of the virus have the propensity to cause...
liver cirrhosis which can lead to liver cancer. There is still difficulty associated with cultivating HCV in vitro and in vivo. In 2012, a new virus closely related to HCV was found in horses. Since there is no immunologically competent small animal model, the equine hepaciviridae (eHcV) is a candidate for a natural history and model of the virus. Cataloguing the similarities and differences between HCV and eHcV is important in establishing this large animal model.

Over 200 blood samples collected from horses of the East Alabama area were screened for eHcV using nested PCR. Viral RNA was extracted from the serum, before being reverse transcribed. The samples underwent nested PCR with primers that targeted a 300 base pair fragment in the highly conserved region of NS5B. After gel electrophoresis, positive screened samples were purified, and the cDNA was sequenced. Sequences were aligned using ClustalW in the MEGA7 program and phylogenetic trees were constructed. Of 283 samples, 5.3% screened positive and yielded eHcV sequences. When aligned with other samples worldwide, eHcV isolates from East Alabama showed a relation to those from other parts of the world. This indicates that eHcV has the potential of being widespread in healthy horses in East Alabama. Clustering of the isolates despite geographical location implies a novel epidemiological model of emergence and spread of a blood borne pathogen in a companion/livestock animal.

Research Grant: USDA/NIFA Capacity Building Grant # 2015-38820-24399

In vitro Antimicrobial Activity Neomycin Loaded PVP/Hydrogel Prepared by Gamma Radiation

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Hydrogels are three-dimensional polymeric structures which are insoluble, yet able to swell in water and fluid while maintaining their shapes. Polyvinylpyrrolidone (PVP) is a hydrophilic and biocompatible polymer used in hydrogel synthesis. PVP/hydrogels have been used in pharmaceutical applications for wound dressings and for controlled drug release, mostly of antibiotics for the treatment of multi-drug resistant infections. Such infections have become global public health problems, because they are difficult to treat, resulting in high management costs and suffering to patients. The use of wound dressing with drug delivery systems has been suggested as an alternative to address this threat. Neomycin is an aminoglycoside and is commonly used against topical infections caused by both gram positive and negative bacteria. In this study, Neomycin-loaded PVP hydrogels were synthesized by gamma radiation at a dose of 25 kGy. In vitro antimicrobial activity was tested against S. aureus and P. aeruginosa bacterial species. The synthesized hydrogel (Neomycin/hydrogel) displayed features of softness and elasticity suitable for use with wound dressing. In vitro experiments for antimicrobial activity were carried out using the neomycin/hydrogels against bacteria grown on solid media. Results showed that the antibiotic was released from polymeric matrix and exhibited the expected antimicrobial activity.

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