OBESITY

RESEARCH

INSTITUTE

6th Annual Meeting

Oral Competition

&

May 12, 2021
9-11A.M. & 1-3P.M. via Zoom

Obesity Research
Institute

This years topic:
Education, Environment, & Health Disparities: Opportunities as a Hispanic Serving Institution

6th Annual
Obesity Research Institute (ORI) Meeting & Competition

May 12, 2021, 9:00-11:00AM & 1:00-3:00PM

Morning Sessions

9:00-9:10AM	**Welcome & Introductions** Dr. Naima Moustaid-Moussa, ORI Director Dr. Jannette Dufour, ORI Associate Director Dr. Joseph A. Heppert, Vice President, OR&I Dr. Brandt Schneider, Dean, GSBS
9:10-9:20AM	**ORI & Program Overview** Dr. Naima Moustaid-Moussa & Dr. Jannette Dufour
9:20-9:50AM	**Food and Hunger in a Warming World**, Dr. Katharine Hayhoe, Political Science & Climate Center, TTU **Q&A** *Dr. Naima Moustaid-Moussa, Moderator*

9:50-10:20AM

Health Disparities, Rural Communities, Outreach & Engaged Scholarship
Dr. Glenn Cummins, Media & Communications, Moderator

- **Project FRONTIER and Caregiver Programs at the Garrison Institute on Aging – Insights into Health Disparities in Aging**
    - o Dr. Volker Neugebauer, Annette Boles, & Dr. Gabriela Ashworth, TTUHSC
- **Family & Community Health Programs**
    - o Andrew Crocker, Texas A&M AgriLife Extension
- **Rural-urban Disparities in Cardiovascular Disease Among Women With Cancer: The Importance of Neighborhood-level Factors**
    - o Dr. Duke Appiah, School of Public Health, GSBS, TTUHSC
- **Preventing Obesity through the Design of Outdoor Learning Environments**
    - o Dr. Kristi Gaines, Department of Design, College of Human Sciences, TTU

Panel Discussion and Q&A

10:20-10:55AM

Opportunities with HSI & Programs for URM, **Panel Discussion** *Cristal Sanchez - Office of Research Development & Communication (ORDC) & Office of Research & Innovation (OR&I) & Jessica Spott - STEM Center for Outreach, Research & Education (CORE), Moderators*

- **Dr. Ashley Gonzales - Division of Diversity, Equity & Inclusion (DDEI)**
    - o DDEI, Hispanic Serving Institute (HSI) & underrepresented minority (URM) initiatives
- **Dr. Stephanie Jones - Education**
    - o NSF ADVANCE
- **Dr. Jaclyn Cañas-Carrell - The Institute of Environmental and Human Health (TIEHH)**
    - o Bridges to the Baccalaureate Program
- **Dr. Amy Boren-Alpízar - College of Agricultural Sciences and Natural Resources (CASNR)**
    - o HSI awardee
- **Cristal Sanchez - Office of Research Development & Communication (ORDC) & Office of Research & Innovation (OR&I)**
    - o HSI Funding opportunities

11:00AM **Closing Remarks**

6th Annual

Obesity Research Institute (ORI) Meeting & Competition

May 12, 2021, 9:00-11:00AM & 1:00-3:00PM

Afternoon Sessions

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1:00-1:25PM	**New Faculty Presentations** *Dr. Lauren Gollahon, Moderator, Biological Sciences* • **Dr. Klementina Fon Tacer** - School of Veterinary Medicine, Texas Tech University • **Dr. Clarissa Strieder-Barboza** - Veterinary Sciences, CASNR, Texas Tech University • **Dr. Kristina Petersen** - Nutritional Sciences, College of Human Sciences, Texas Tech University • **Dr. Ion Alexandru Bobulescu** - Cell Biology and Biochemistry, Texas Tech University Health Sciences Center
1:25-1:45PM	**Student/Postdoc Competition & Judging,** *Dr. Conrad Lyford, CASNR, Moderator*
1:45-2:30PM	**Networking,** *Cristal Sanchez, ORDC, Moderator*
2:30-2:45PM	**Networking Reports**
2:45-3:00PM	**Closing Remarks- Announcing Winners,** *Dr. Naima Moustaid-Moussa & Dr. Jannette Dufour*

Welcoming Remarks

Joseph A. Heppert, Ph.D.
Vice President for Research & Innovation
Texas Tech University

Previously, he served as Associate Vice Chancellor for Research at the University of Kansas (KU). He chaired the KU Chemistry Department from 2005-2009 and was the founding director of the University's Center for Science Education from 2001-2009. He is a Fellow of the American Chemical Society, and currently serves as chair the American Chemical Society's Committee on Budget and Finance.
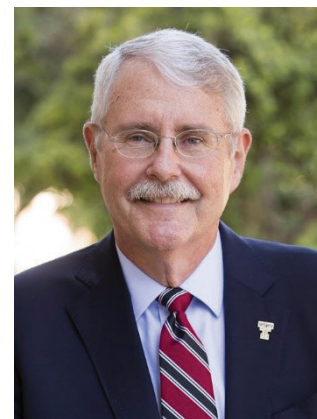
Dr. Heppert's initial research focused on organo transition metal chemistry. This research resulted in the isolation and characterization of the first class of air stable terminal transition metal carbide compounds. Dr. Heppert has also been active in projects to improve science teaching and science teacher preparation. He is past chair of the American Chemical Society's Committee on Education. In this role he testified before the U.S. House of Representatives' Committee on Science and the National Science Board on science education policy issues.

Dr. Heppert received a B.S. in Chemistry from San Jose State University in 1978, where he participated in heavy elements research at the Lawrence Livermore National Laboratory. He was awarded a Ph.D. in Inorganic Chemistry from the University of Wisconsin-Madison in 1982, studying under Donald Ganies. He completed postdoctoral training at Indiana University under the direction of Dr. Malcolm Chisholm. He joined the chemistry faculty KU in 1985 and moved to Texas Tech University in 2017.

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Brandt Schneider, Ph.D.
Dean of Graduate School of Biomedical Sciences
Texas Tech University Health Sciences Center

Dr. Schneider has served as the Dean of the Graduate School of Biomedical Sciences since 2013 and has been a faculty member since 1999. He is a tenured Professor in the Departments of Medical Education and Cell Biology and Biochemistry. He is currently the Co-Director with Dr. Kerry Gilbert of the Institute of Anatomical Sciences. His research interest focuses around cell cycle control and the genetics of aging. Dr. Schneider is an avid golfer and loves spending time with his family.

Naima Moustaid-Moussa, Ph.D.

Horn Distinguished Professor, Nutritional Sciences & Founding Director, ORI
Texas Tech University

Dr. Naima Moustaid-Moussa is a Paul W. Horn Distinguished Professor in Nutritional Sciences and Founding Director of the Obesity Research Institute at Texas Tech University. She completed her Ph.D. in Endocrinology at the University of Paris, and a postdoc training in molecular nutrition at Harvard School of Public Health. Before joining TTU in 2012 as a senior strategic hire and professor in nutritional sciences, she previously served as professor and co-director of the Obesity Research Center at the University of Tennessee (UT) Knoxville and the UT Institute of Agriculture.

Dr. Moustaid-Moussa leads a funded basic and integrated nutrition and obesity research program, focuses on nutrigenomics and the endocrine function of adipose tissue in metabolic diseases. Her current research includes mechanisms by which (1) the adipocyte renin angiotensin system increases inflammation and insulin resistance in metabolic diseases and breast cancer and (2) bioactive compounds (such as omega 3 fatty acids, tart cherry anthocyanins and other polyphenols) reduce obesity-associated white adipose tissue inflammation and breast cancer cell migration, activate brown fat, increase lifespan and alleviate metabolic dysfunctions in Alzheimer's disease. Her lab uses cell, animal models and model organisms (C. elegans) of obesity, aging and Alzheimer's disease. Her secondary areas of interest include beta cell function in diabetes, and obesity/childhood obesity prevention. Dr. Moustaid-Moussa's research has been funded by federal agencies (NIH and USDA), foundations (AHA) and international Foundations (Qatar National Research Funds) as well as industry (Empirical Foods, Inc). She has extensively published in top tier peer-reviewed journals (>160 papers) and served in leadership positions within the American Society for Nutrition (ASN), The Obesity Society (TOS), and the American Heart Association (AHA). She currently serves as a member (2016-2022) of the NIH Human Studies of Diabetes & Obesity (HSDO) study section, and as member of several scientific journal editorial boards including Scientific Reports (Nature Springer), J. Nutritional Biochemistry (Elsevier) and Frontiers Journals. She also serves as Region 1 representative on the statewide Live Smart Texas steering committee, dedicated to obesity prevention and resources.

Dr. Moustaid-Moussa's excellence in scholarship and mentoring was recognized though several awards including the 2012 Outstanding Investigator award and 2015 Pfizer Consumer Healthcare Nutritional Sciences award, both from ASN; the 2018 Nancy J Bell Outstanding Mentor Award from the TTU Graduate School; the 2019 Outstanding Faculty Mentor for Undergraduate Research from the TTU Center for Transformative Undergraduate Experiences; and was recognized as a 2020 Outstanding Researcher by the TTU Office of Research & Innovation. In 2020, she was awarded the Korean Nutrition Society Award, sponsored by ASN and was elected to the ASN Board of Director, as a Director-At-Large representing Nutrition Mechanisms; she was also appointed as Paul W. Horn Distinguished Professor and awarded the Barnie E Rushing Jr. Faculty Distinguished Research Award for STEM Disciplines.

Jannette Dufour, Ph.D.
University Distinguished Professor
Texas Tech University Health Sciences Center

Dr. Jannette M. Dufour is currently a professor in the Department of Cell Biology and Biochemistry in the School of Medicine at Texas Tech University Health Sciences Center and Associate Director of the Obesity Research Institute. She received her Ph.D. in Genetics and Cell Biology from Washington State University in 1999 and trained as a postdoctoral fellow with the Islet Transplantation Group in the Surgical Medical Research Institute, Department of Surgery at the University of Alberta, Edmonton, Canada from 1999-2005.

The focus of her research is exploring the therapeutic potential of immune privileged Sertoli cells as a means to improve outcomes of transplantation. Specifically, her lab is testing the feasibility of using immune privileged Sertoli cells for cell based gene therapy as well as examining the mechanism(s) of Sertoli cell immune protection in order to improve survival of insulin-expressing cells as a treatment for diabetes.

Her research has been funded by several national and local agencies including the NIH, American Diabetes Association, and Texas ARP. Dufour was selected for the cover photo for Cell Transplantation (2008), Spermatogenesis (2012), and DNA and Cell Biology (2018). She has also been highlighted in Biology of Reproduction (2014) and Nature Medicine (2018). Invitations to give seminars at several universities as well as national and international meetings include American Society of Andrology (ASA; 2007, 2016), Society for the Study of Reproduction; 2012, 2016), NIAID (2017), and NIEHS (2017). She has received the TTUHSC President's Young Investigator Award (2011), the Outstanding Women Leader (OWL) Award from the West Texas Association for Women in Science (2013), the Harry M. Weitlauf Anatomy Teaching Award (2013), the Dean's Basic Science Teaching Award (2017), and the President's Team Teaching Award (2019-2020).

Moderators

Glenn Cummins, Ph.D.
Texas Tech University

My research explores how the structural and content features interact with audience characteristics to shape processing and response to media messages. My research largely falls under the umbrella of media psychology. Although much of this research has examined sports media and communication, I have mainly used that genre as a vehicle to explore theories of audience processing and response.

In addition, my work has used novel measurement approaches or technologies to examine how individuals attend to, process, or respond to messages. This work has used a variety of tools, including eye tracking, continuous response measurement (or dial testing), psychophysiology, or reaction time.

Lastly, my research has increasingly explored the role of communication and media messages in partnership with scholars working in a variety of disciplines and topics, including agricultural sciences, climate and the environment, and health and obesity.

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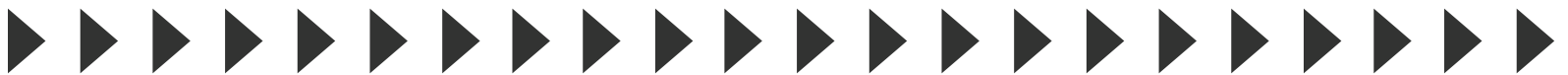
Cristal P. Sanchez
Texas Tech University

Cristal Ponciano currently serves as a Program Manager for the Office of Research Development & Communications in the Office of Research & Innovation. In her role she collaborates in planning and implementing research development events and projects while also managing the limited submission competition process. Her main focus is in identifying future and current funding opportunities that align with faculty research interests and institutional strengths, as well as coordinating and supporting grantsmanship workshops.

Cristal received her Bachelor of Science in Human Development and Family Studies in 2007 from Texas Tech, as a First-Gen. Cristal is currently working on her master's degree at TTU alongside obtaining the following certificates: Grants and Proposals; Higher Education Administration; and Cross-Cultural Studies. She is on course to graduate in December 2021.

She is a first-year Staff Senator who also volunteers her time on the Diversity Committee. She is on the Executive Committee for the Obesity Research Institute and assists in hosting their annual meeting as well as coordinating other collaborative and informative, networking events.

Jessica Spott
Texas Tech University

Jessica Spott completed her first degree from Texas Tech in 2008, in Communication Studies and Spanish. She also completed a Master's Degree in Communication Studies. Jessica joined the STEM Center for Outreach, Research & Education formally in 2015, but has worked with outreach coordination and funded program management, specifically with undergraduate researchers since 2011.

She is responsible for the day to day operations of STEM CORE, and she focuses on outreach initiatives and program development. She is pursuing her PhD in Educational Psychology, and is specifically researching MotherScholars in STEM fields for her dissertation. She is working to continue to publish and get grants for STEM CORE. She is particularly passionate about increasing equity and diversity in STEM fields.

When she is not working in the office, Jessica is working on her dissertation, playing with her 2 boys, or adventuring around the globe with her husband! She is particularly a fan of podcasts, a long game of dominoes or cards, and never-ending cups of hot chocolate.

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Lauren Gollahon
Texas Tech University

The main focus of my lab involves investigating differences in cell specific regulation controlling senescence and immortalization between breast epithelial and stromal cells. We are particularly interested in discerning the differences in the molecular mechanisms that allow epithelial cells to become cancerous 100 times more often than stromal (fibroblast) cells. Current projects include quantitating calcium changes based on cell type and chemotherapies, the role of calcium in determining the mechanism of programmed cell death, estrogen receptor isoform involvement with metastasis and testing candidate anticancer agents. A second focus is determining cell type specific differences in organelle function. More specifically, we are interested in membrane potential changes between the endoplasmic reticulum and mitochondrion. Furthermore, we are beginning to investigate the involvement of obesity and breast cancer development and progression.

Conrad Lyford

Texas Tech University

Dr. Lyford focuses on developing solutions in the often interrelated fields of agribusiness, health care and development.   He has worked on a number of topics including strategic management, quality, health economics, development and marketing. In the US, he led multidisciplinary teams to develop solutions to the obesity epidemic and prevent cancer including using social media and community approaches. During his recent Fulbright to Ethiopia, he has been focused more on agribusiness, value chain and nutrition access issues.

Keynote Speaker

Climate Change, Food, & Hunger in a Warming World

Katharine Hayhoe, Ph.D.
Texas Tech University

Katharine Hayhoe is an atmospheric scientist whose research focuses on understanding what climate change means for people and the places where we live. She is the Chief Scientist for The Nature Conservancy and a Horn Distinguished Professor and Endowed Professor of Public Policy and Public Law in the Dept. of Political Science at Texas Tech University. Her book, "Saving Us: A Climate Scientist's Case for Hope and Healing in a Divided World," will be released in Sept 2021 and she also hosts the PBS digital series Global Weirding, currently in its fifth season. Katharine has been named one of TIME's 100 Most Influential People, the United Nations Champion of the Environment, and the World Evangelical Alliance's Climate Ambassador.

Health Disparities, Rural Communities, Outreach, & Engaged Scholarship

Project FRONTIER and Caregiver Programs at the Garrison Institute on Aging – Insights into Health Disparities in Aging

Volker Neugebauer, Ph.D.

Texas Tech University Health Sciences Center

Dr. Neugebauer is Professor and Chair of the Department of Pharmacology and Founding Director of the Center of Excellence for Translational Neuroscience and Therapeutics at TTUHSC. He was recently appointed as the Executive Director and Chief Scientific Officer of the Garrison Institute on Aging at TTUHSC. A neuroscientist with background in neurology Dr. Neugebauer has been neuroplasticity in higher brain functions and dysfunctions over the past 25 years. He directs a translational research program on chronic pain, comorbid conditions, neuropsychiatric disorders, and neurodegenerative diseases. The analysis of emotional-affective and cognitive brain mechanisms of pain centered on the amygdala, a brain center for emotions, and interactions with cortical regions is a key contribution of Dr. Neugebauer's work to the field of pain research and neuroscience. Collaborative research projects explore brain mechanisms of neurodegenerative disorders including Alzheimer's disease, alcohol use and addiction disorders, comorbidities with depression and anxiety disorders, epileptogenesis, and aging-related health issues through innovative research, education, and community outreach programs. The Garrison Institute on Aging and the Center for Translational Neuroscience and Therapeutics have established collaborations between basic scientists and clinicians across TTUHSC and TTU. Dr. Neugebauer's work has been continuously funded by NIH for more than 20 years. He is currently supported by 5 NIH R01 grants and a USDA grant (4 of these as Principal Investigator), and by Foundation and Endowment grants. He has a track record of productivity with an h-index of 50, more than 110 peer-reviewed articles including in "Science" and "Science Translational Medicine", and nearly 30 review articles and book chapters. He has given more than 140 lectures as invited speaker. He is the recipient of the TTUHSC President's Excellence in Research Award, the Douglas M. Stocco Scholarship/ Research Award, and the Chancellor's Council Distinguished Research Award. The overall goal of Dr. Neugebauer's work is the generation and dissemination of knowledge about disease mechanisms and development of novel therapeutic strategies to improve quality of life and healthy aging, which is an important benefit to medical school education, graduate training, and to society.

Annette Boles, MS
Texas Tech University Health Sciences Center

Annette Boles serves as Director of the GIA Community Outreach and Education Division. During her 15-year long tenure at the GIA, she has established long standing collaborative partnerships both locally and statewide, has assisted in securing over $2 million in funding and developed multiple initiatives, including Healthy Lubbock, Healthy Aging Lecture Series, DSMP and CDSMP workshops, Care Partner Program, and RSVP. In 2009, she led the health and fitness intervention, GET FiT, which later resulted in grant funding that enabled the GIA to establish a farm-to-work program, a worksite wellness program, community gardens, a new walking trail, and other environmental policy changes. Under her leadership, the GIA team sought training in evidence-based programming in 2018, which led to the implementation of CDSMP and DSMP in Lubbock and the surrounding communities.

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Gabriela Ashworth, Ph.D.
Texas Tech University Health Sciences Center

Dr. Gabriela Ashworth is a faculty member in the Department of Pharmacology and Neuroscience and the Garrison Institute on Aging at the Texas Tech University Health Sciences Center. She holds a PhD in Public Health from the Gillings School of Global Public Health at the University of North Carolina at Chapel Hill. She has been actively involved in healthy aging research and community outreach programs, and serves as Co-Principal Investigator of Project FRONTIER, a longitudinal cohort study collecting aging-related health data from rural West Texas communities to identify risk and protective factors of Alzheimer's disease and cognitive decline.

Family & Community Health Programs

Andrew Crocker, MS

Texas A&M AgriLife Extension Service

Andy Crocker's role is to support County Extension Agents for Family and Community Health in their efforts to educate older adults, caregivers, and the professionals who serve them.

Older adults improve their health literacy through communication with their health provider and better medication management; navigate the Internet and access reliable health information; and provide information and referral to grandparents rearing their grandchildren. Mr. Crocker also oversees the Master Wellness Volunteer Program, leveraging Extension's outreach and education related to health, nutrition and physical activity through trained volunteers.

A popular conference speaker, Mr. Crocker is frequently sought to provide training to professionals and/or information to the public at conferences within Texas and throughout the nation. To-date, he has sought and received over $5.3M in competitive grant funding from local, state, and federal sources, including more than $4.9M as Principal Investigator.

Mr. Crocker serves on a number of boards throughout the State of Texas. He is a past recipient of Texas A&M AgriLife Extension Service's Award for Superior Service, as an individual and as part of a team, and a two-time recipient of the Texas Extension Association of Family and Consumer Sciences' Specialist Award for Distinguished Achievement.

Mr. Crocker earned a B.A. in Biology (2001) and an M.S. in Gerontology (2002) from Baylor University in Waco, Texas.
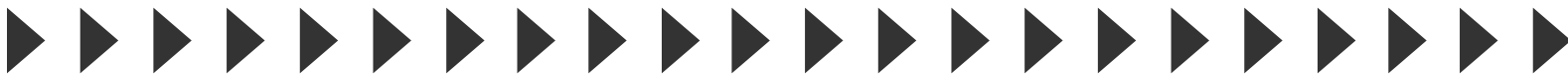
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Rural-urban Disparities in Cardiovascular Disease Among Women With Cancer: The Importance of Neighborhood-level Factors

Duke Appiah, Ph.D., MPH

Texas Tech University Health Sciences Center

Duke Appiah is an epidemiologist with expertise in advanced epidemiologic methods focusing on statistical theory and analysis. His primary research goals are broad and directed at understanding the etiology and prevention of chronic diseases, specifically cardiovascular disease, diabetes and obesity with emphasis on women, reproductive health, and, minority as well as underserved populations. Other research interests of his includes the intersection of infectious and chronic diseases on long-term health.

Preventing Obesity through the Design of Outdoor Learning Environments

Kristi Gaines, Ph.D.
Texas Tech University

Kristi Gaines is an Associate Dean of the Graduate School and Professor in the Department of Design. Through research that investigates ways built environments can accommodate diverse populations through design, Gaines has achieved national recognition as a leader in designing learning environments and other spaces for individuals with sensory sensitivities and developmental disorders. She is also co-founder of the Texas Tech University Coalition for Natural Learning and is a member of a state-wide leadership team, created by the Texas Department of State Health Services – Obesity Prevention Program, to implement an outdoor learning environment health intervention in Texas. Gaines' book, Designing for Autism Spectrum Disorders, was recognized with awards from the four leading organizations for interior and environmental design. With more than two decades of professional interior design and teaching experience, Gaines has served in leadership roles in industry organizations including the Interior Design Educators Council and the International Interior Design Association. She is a member of the Teaching Academy and is an inaugural graduate of the President's Leadership Institute at Texas Tech University.

Published in numerous academic journals, Gaines' research investigates the impact of learning environments for people of all abilities. A current project combines neuroscience and augmented reality visualization using fMRI technology to compare the behavioral and neural responses for individuals with Autism Spectrum Disorders. She has also teamed up with researchers in apparel design and manufacturing to develop functional clothing for children with sensory integrative differences. Most recently, she was awarded the Chancellor's Council Distinguished Research Award and the President's Emerging Engaged Scholarship Award.

Opportunities with HSI, Programs for URM, & Panel Discussion

Ashley Gonzales, Ph.D.
Texas Tech University

Senior Director, Office of Institutional Diversity. Dr. Gonzales has worked in higher education since 2010, serving in various roles at Texas Tech including institutional diversity, undergraduate education, and student affairs. She serves as the senior leader within the Office of Institutional Diversity (OID), which provides strategic oversight and implementation of faculty and staff efforts across the institution including equitable hiring practices, faculty chair hiring trainings, faculty search committee workshops, and developmental diversity and inclusion programs for staff members across the institution. She also leads the OID efforts in working with representatives of local and state governments, area schools districts, and businesses to foster initiatives that promote DEI. She serves as the institutional representative leading Title III and Title V annual federal submissions, while also coordinating the university's Hispanic Serving Institution (HSI) initiatives. Prior to this role, Dr. Gonzales led a student portfolio managing and directing day to day operations of First-Generation Transition and Mentoring Programs (FGTMP), the creation and implementation of the DREAM Resource Center, and the Office of Academic Enrichment/AVID. Dr. Gonzales holds a Bachelor of Arts Degree in Communication Studies, a Master of Public Administration, and a Ph.D. in Higher Education Research.

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Jaclyn Cañas-Carrell, Ph.D.
Texas Tech University

Jaclyn Cañas-Carrell serves as Interim Vice Provost for Curriculum with responsibilities to coordinate curriculum approval and review processes across the university. She joined the Provost's staff after serving as Director of the TTU STEM Center for Outreach, Research, and Education (STEM CORE).

Dr. Cañas-Carrell is a Professor in the Department of Environmental Toxicology. She previously served as the chair of the department's Curriculum Committee from 2012-2014 and as the Graduate Advisor from 2014-2017. She also served as Chair of the President's Gender Equity Council from 2018-2020. She received her bachelors and doctorate from Texas Tech University.

Dr. Cañas-Carrell's area of expertise is in nanotoxicology with research critical for assessing environmental risks posed by nanomaterials. She is an internationally recognized scientist with one patent, over 40 peer-reviewed journal articles and 3 book chapters. She has secured over $8.3 million in competitive federal funding as PI or Co-PI since 2008. In addition to her scientific research contributions, she has made significant contributions to training students in STEM and to ensuring the future of the U.S. STEM workforce. She received the Chancellor's Council Distinguished Research Award in 2013 and a President's Excellence in Research Professorship in 2019.

Stephanie Jones, Ed.D.
Texas Tech University

Stephanie J. Jones is a professor and program coordinator of the higher education program at Texas Tech University. She serves as the PI of TTU's NSF ADVANCE-ADAPTATION grant, Advancing Equity through Systemic Strategies to Improve Leadership, Departmental Collegiality, and Data Transparency at Texas Tech University. Dr. Jones' research focuses on access and equity within organizational structures, with specific interest in gender equity, as well as the roles of department chairs in faculty success. Her work has recently evolved to a more focused view of the systemic issues that occur within organizational structures that prevent all genders from thriving in the working environment.

Dr. Jones currently serves on the editorial boards of various higher education journals. Before joining the faculty at Texas Tech University, Dr. Jones served in leadership roles in distance learning, dual enrollment, instructional technology, and faculty support. Prior to her career in higher education, Dr. Jones had a professional career in information technology in software development and project management.

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Amy Boren-Alpízar, Ph.D.
Texas Tech University

Amy Boren-Alpízar is an Associate Professor in the Department of Agricultural Education & Communications at Texas Tech University. Her work has focused on empowering youth and women in international rural community development. Amy currently leads a Hispanic Serving Institution grant that focuses on enhancing degree-completion rates among underrepresented students in the College of Agricultural Sciences and Natural Resources.

New Faculty Presentations

Crossroads of Reproduction, Cancer, and Obesity: The role of Cancer-testis Antigens in Tumor Metabolic Plasticity

Klementina Fon Tacer DVM, Ph.D.
Texas Tech University

Klementina Fon Tacer is an Assistant Professor at the TTU School of Veterinary Medicine and a Cancer Prevention and Research Institute of Texas (CPRIT) Scholar. She originally comes from Slovenia, Europe. After obtaining her DVM and PhD degrees from the University of Ljubljana, Slovenia she came to the U.S. for her post-doctoral training at the UTSW Medical Center in Dallas, TX, and St. Jude Children's Research Hospital in Memphis, TN. The overarching aim of Dr. Fon Tacer's research is to uncover mechanisms that evolved to protect mammalian cells against stress and help them adapt to an ever-changing environment, including nutrient availability. The FonTacerLab wants to discover how these protective pathways are regulated in normal physiology and why they get hijacked in cancer. Ultimately, they would like to apply the insights learned for the advancement of cancer treatment and fertility preservation in humans and animals.

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Adipose Tissue Biology in the Context of Metabolic Diseases

Clarissa Strieder-Barboza
Texas Tech University

Clarissa Strieder-Barboza joined the department of Veterinary Sciences at Texas Tech in January 2021. She earned her degree in veterinary medicine at the Universidade Federal de Santa Maria in Santa Maria, Brazil, and her master's degree in veterinary science-animal health from the Institute of Veterinary Clinical Sciences at the Universidad Austral de Chile in Valdivia, Chile. Her doctorate in comparative medicine and integrative biology from Michigan State University College of Veterinary Medicine's focused in the roles of the adipokine Fetuin-A on the balance between lipolysis and lipogenesis in adipose tissue of periparturient dairy cows. Prior to joining the Tech faculty, Strieder-Barboza served as a postdoctoral research fellow in University of Michigan Medical School's Department of Surgery in Ann Arbor, Michigan, where her translational biomedical research focused on adipocyte progenitor cells dysfunction in obesity-associated type 2 diabetes in humans. She also worked as a veterinary instructor with the College of Veterinary Medicine and Animal Science at the Universidad Cooperativa de Colombia in Colombia. Strieder-Barboza's primary goals is to uncover mechanisms by which dysfunctional adipose tissue remodeling negatively impacts health of periparturient dairy cattle and humans with obesity. She aims at developing collaborative research to identify novel targets and therapeutic and nutritional strategies for preventing metabolic disease, relevant to both animal and human health.

Diet and Cardiometabolic Health Lab

Kristina Petersen Ph.D., APD, FAHA
Texas Tech University

Dr. Kristina Petersen has a Bachelor of Nutrition and Dietetics (Honors) from Flinders University (Australia) and a PhD in Nutrition from the University of South Australia (Australia). She completed postdoctoral training in public health and epidemiology at The George Institute for Global Health (Australia), and in clinical nutrition at The Pennsylvania State University. Dr. Petersen was an Assistant Research Professor at The Pennsylvania State University from 2018 to 2020. She joined the Department of Nutritional Sciences at TTU as an Assistant Professor in Fall 2020.

Dr. Petersen's research focuses on nutritional strategies to delay and prevent the onset of cardiometabolic diseases. She studies the efficacy and effectiveness of dietary interventions to reduce metabolic dysfunction and the risk of cardiometabolic diseases in at-risk populations. Dr. Petersen conducts human clinical trials to examine the effect of individual foods, bioactives and dietary patterns on risk factors for cardiometabolic diseases. In addition, she aims to translate research findings gained under highly controlled conditions to strategies, underpinned by behavior change theory, that improve the overall diet of free-living individuals.

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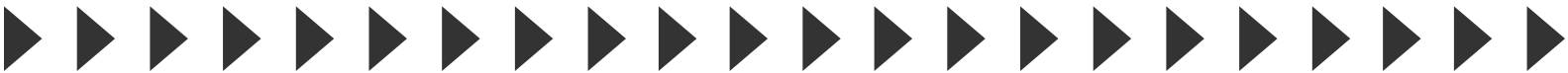
Obesity and the Kidney: From Stones to Cancer

Ion Alexandru Bobulescu, Ph.D.
Texas Tech University

Dr. Bobulescu received his medical degree from Romania and completed postdoctoral training in renal physiology at the University of Texas Southwestern Medical Center (UTSW). He was Assistant Professor of Internal Medicine at UTSW for six years before joining TTUHSC in 2018 as Associate Professor in the Departments of Cell Biology and Biochemistry and Internal Medicine.

Abstracts

Kazi Farhana Afroz

Autism Spectrum Disorder (ASD) is one of the most common forms of neurodevelopmental disorders, affecting approximately 1% of the population worldwide. Despite being highly prevalent, the exact mechanisms underlying the abnormal nervous system development in ASD are not fully known. Several recent studies have shown a potential effect of maternal gut microbiome alteration on offspring neurodevelopment in animal models as well as in humans. While the offspring's brain and immune system development depend on the initial microbial population obtained from the mother, depletion of beneficial microbes such as Lactobacillus can hamper it. As the gut microbial population is heavily modulated by dietary habits, offspring ASD has also been associated with maternal diet. For instance, consumption of a high-fat diet in female mice has been associated with ASD in the offspring and the underlying mechanisms involved maternal gut microbiota alteration. Similarly, salt, another very common dietary component, has been associated with altered gut microbiota. Furthermore, overconsumption of salt is a matter of concern as the majority of people worldwide consume more salt than what the World Health Organization (WHO) recommends. This excessive salt comes primarily from processed foods. Studies suggest that besides causing a heart attack, stroke, and hypertension, elevated dietary salt can significantly alter the gut microbial composition especially by depleting Lactobacillus spp. Our preliminary data show that offspring from high salt-fed female mice elicits ASD-like behavior. Therefore, I am hypothesizing that offspring from high salt diet (HSD) mother shows ASD-like behavioral phenotypes due to gut microbiome alteration.

Link to presentation: https://www.youtube.com/watch?v=JO5OS0bJAlM

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Bailee Alonzo

Alzheimer's disease (AD) is a progressive neurodegenerative disorder with aging as a risk factor. Several longitudinal studies identified Type 2 diabetes (T2D) as a major risk factor for developing dementia attributable to AD. Similar to T2D, clinical studies report that AD patients often exhibit altered peripheral and brain glucose regulation, characterized by hyperinsulinemia or insulin resistance. In animal studies, thermogenic brown adipose tissue (BAT) is reported to have a high rate of insulin-independent glucose uptake. Studies also described improved BAT activity in long-lived animals compared with short-lived animals. BAT not only is integral to metabolism, but the aging process as well as animal studies demonstrate thermoregulatory deficits may contribute to AD pathogenesis. Therefore, the objective of this study is to determine the role of BAT in pathogenesis of AD. E4orf1 is an adenovirus-derived protein that improves glucose uptake in adipose tissue and skeletal muscle and reduces glucose output by hepatocytes. E4orf1 bypasses the proximal insulin signaling, but upregulates distal insulin signaling, without causing hyperinsulinemia which is linked to AD pathogenesis. In APP/PS1 mice model of AD, E4orf1 expression improves peripheral glycemic control independent of endogenous insulin secretion and ameliorates cognitive decline by preventing brain mitochondrial dysfunction. In this study we wanted to examine changes in BAT from 14-20 month-old APP/PS1/E4orf1 and APP/PS1 control mice exposed to a 60% high fat diet (HFD) supplemented with 600mg/Kg doxycycline to induce E4orf1 expression. Gene expression data shows that E4orf1 expression in APP/PS1 mice protects BAT against age associated inflammation and thermogenic dysfunction.

Link to presentation: https://www.youtube.com/watch?v=8SbIM924tls

Kirk Balderas

Nonalcoholic fatty liver disease (NAFLD) is a common comorbidity of obesity that is characterized by an accumulation of triglycerides (TG) in the liver. Previous studies in our lab have shown that fish oil (FO) attenuates adiposity and fatty liver in mice fed a high fat diet (HF; 45% kcal fat). These improvements may have been mediated through uncoupling protein 1 (UCP1), which was upregulated by FO in brown adipose tissue (BAT). Therefore, we sought to determine the metabolic effects of FO in livers of UCP1 knockout mice fed a HF diet without fish oil (KO-HF) or with fish oil (KO-FO) for 14 weeks at in a thermoneutral environment (28áµ-30áµC). We measured body weight (BW), TG content and conducted gene expression analyses in liver tissues from these mice. FO significantly reduced hepatic TG despite no significant differences in BW. Hepatic RNA sequencing was conducted to determine differentially expressed genes (DEG) between KO-HF and KO-FO. Ingenuity Pathway Analysis® (IPA) was used for functional analyses, integration and interpretation of significantly altered pathways relevant to NAFLD and obesity. We identified 16 pathways that may be related to the reduced TG with FO. For example, fatty acid β-oxidation, a metabolic pathway that breaks down fatty acids to create energy, was significantly upregulated in the KO-FO group. Using real time PCR, we further validated significant upregulation of mRNA levels for Ehhadh, Acox1, Pex5, Pparα, and Cpt1 and Cpt2, all of which are involved in mitochondrial and peroxisomal fatty acid oxidation.

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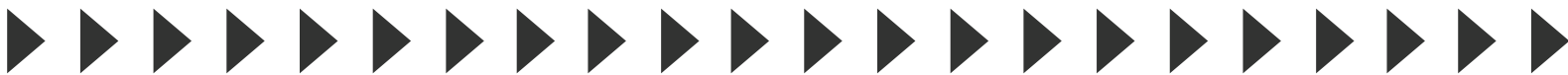
Lauren Boleng

Metabolic dysfunction resulting from obesity and diabetes induced inflammation is a significant risk factor in Alzheimer's disease. The systemic inflammatory effect on the glia and neurons trigger imbalance in cellular homeostasis. The long-term effect of defective energy homeostasis results in loss of synaptic transmission, hypometabolism, and neuronal loss. Brain metabolic syndrome (Bmets) is closely linked to obesity and is characterized by increased diabetes and depression. Bmets is correlated explicitly with abnormalities in the brain and dysfunction of cognitive abilities. The objective of our research is to investigate metabolic dysfunction in neurons that originated in distinct brain areas of obesity (hypothalamus), depression (raphe), and dementia (hippocampus). We hypothesize that neurons treated with sodium palmitate and challenged with high glucose will show metabolic dysfunction phenotype. We investigated obesity-related in vitro metabolic changes in neuronal cell models - 1. HT22 (hippocampal neurons), 2. mHypo (hypothalamic neurons), 3. RN46A-B14 (serotonergic neurons) treated with 5 mM sodium palmitate for 24 hours. The control and treated cells were harvested and analyzed for mRNA levels of genes representing the preadipocyte to adipocyte transitions. We used qRTPCR based low-density array, immunohistochemistry, and Mito stress XF bioanalyzer assay to evaluate metabolic dysfunction. Genes related to metabolic dysfunction are differentially altered in hypothalamuns, hippocampal and serotonin positive neurons. We discuss the effects of metabolic dysfunction in multiple neuronal cells with altered gene expression levels.

Link to presentation: https://www.youtube.com/watch?v=pcPWbSGTVNQ

Emily Garrison

The goal of this study is to investigate the effect of pH enhanced proteins on gut microbiome composition in vivo. Gut microbiota will be analyzed from mice fed high fat diets with lean beef protein or casein protein and control mouse chow high and low fat diets, under normal pH conditions or pH enhanced. We hypothesize that lean beef with ammonium enhanced pH reduces the microbial diversity as well as the microbial abundance than the non-pH enhanced beef modeled after western style diets. Semi-annual fecal collection, intestinal scrape, DNA sequencing and comparative analysis, physical examination and gut tissue histology examinations using immune competent C3H/HeJ mice. More info on mouse model. Normal pH high fat diets may cause small intestine inflammation, an increase in Lactobacillus reuteri and Bifidobacterium animalis as predominant species, associated with animal obesity. We also expect to see an increased gut microbial species abundance and diversity in mice fed the unenhanced pH diets. This study will address the impact of pH enhancement on one dietary component, namely protein, on gut microbiomes, and its relationship to obesity and metabolic syndromes. It will also help to determine if an altered diet pH can help mitigate these problems.

Link to presentation: https://www.youtube.com/watch?v=349lPEoYR7s

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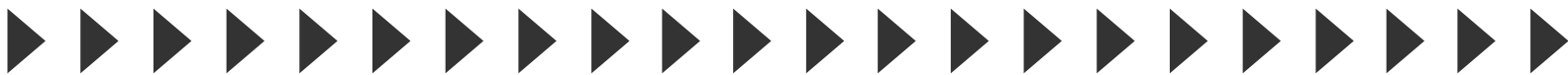
Joao Pedro Torres Guimaraes

Overactivation of the renin angiotensin system (RAS), such as the precursor angiotensinogen (Agt) has been associated with inflammation and dysfunction in cellular processes like autophagy, both linked to obesity and type 2 diabetes (T2D). However, limited studies have investigated the role of RAS in T1D. Thus, our aim is to compare effects of manipulating RAS in both T1D and obesity, with emphasis on the role of autophagy and insulin receptor signaling. Streptozotocin (STZ) induced - T1D mice or high fat (HF) fed mice that overexpressed angiotensinogen (Agt-Tg) in adipose tissue and their respective Wild type (Wt) controls were treated with captopril. Body weight, glycemia and plasma adipokines were measured. Muscle and hepatic mRNA levels of RAS, autophagy and insulin signaling markers were measured. Regardless of captopril (C) treatment, T1D mice had lower plasma leptin and resistin, and higher non-esterified fatty acids, compared to Wt. Moreover, Agt, At1, Insr, Irs1 and Beclin1 mRNA levels in muscle and liver of T1D+C were increased compared to Wt. Muscles from HF+C mice had increased Irs1 compared to HF Wt. However, liver of HF+C showed decreased Agt, At1, Insr, Irs1, Ampk, Beclin1, Agt12 and Lc3, compared to HF Wt. We only observed reduced Beclin1 in HF Agt-Tg+C mice compared to HF Agt-Tg mice. Captopril regulates RAS, insulin and autophagy pathways in both muscle and liver, indicating a possible role of RAS in regulating insulin sensitivity and autophagy in T1D and obesity.

Link to presentation: https://www.youtube.com/watch?v=FzYNX4rOpmU

Shyanne Hefley

Both obesity and depression are very prevalent and associated with numerous health complications, including hypertension, coronary heart disease, and increased mortality. The CDC estimates that nearly 13.7 million adolescents are overweight or obese in the United States. Although numerous studies confirmed strong association between obesity and mental health, there are no studies that have focused on gender difference in adolescents. The goal of the study was to evaluate the mental health and emotional functioning among adolescents that are overweight or obese. Six overweight (BMI 26-29), nine obese (BMI >30), and normal weight (BMI <25) adolescents were screened for psychological status using PSC-Y self-assessment standardized questionnaire. IRB approval was obtained before screening and informed consent and assent were signed by the parents and adolescents. The study was performed at the Department of Pediatrics at TTUHSC, Amarillo campus. Upon completion of the questionnaire, patients were scored on internalization problems (depression/anxiety), externalizing problems (conduct disorders), attention problems (ADHD), suicidal tendencies, and other non-categorized behaviors. Overall, a general higher score indicates more mental health related problems. Non-parametric statistics was used to compare the groups.Overweight adolescents exhibited higher PSC-Y scores compared to obese and normal weight peers. Interestingly, overweight adolescents also showed increased internalization and non-categorized problems compared to obese and healthy adolescents, suggesting that overweight mentally affects adolescents more than obesity. As a result, a mental health questionnaire should be routinely used in pediatric clinics to assess mental status in patients with overweight and obesity.

Link to presentation: https://www.youtube.com/watch?v=JUf_LHchXts

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Jaden Hendrix

Dietary intakes can either raise or lower risk factors in cancer. Studies demonstrate a relationship between obesity and cancer. Â Western-style diets contain a high source of fats and proteins, which increases inflammation and decreases metabolic acidity, both of which are implicated in cancer progression. In this project, we will investigate how diets with different protein sources, fat content and pH affect cancer development in a mouse model for cancer. C3H/HeJ mice will be fed diets with either neutral or alkaline pH casein or beef protein components. Mice will be evaluated weekly for weight gain and food consumption. Monthly measurements of lean mass and fat composition will be preformed by MRI, and tissues will be collected at 6 month time points. Tissues will be analyzed by histology for structural changes. Tissue will be fixed in formalin for histological processing and staining for specific cancer associated markers. Tissue samples will also be flash frozen for DNA, RNA and protein analysis, investigating markers for metabolism. We predict that the changes in pH will attenuate diseases such as cancer development. This research was supported by Empirical Foods Inc and the NIH Plains Bridges to the Baccalaureate Program.

Link to presentation: https://www.youtube.com/watch?v=lLaFc1NDfdl

Arun Maharaj

To determine if one dose of L-citrulline (CIT) attenuates brachial and aortic blood pressure (BP) responses to plantarflexion exercise alone (Ex) and with cold pressor test (Ex+CPT) in obese hypertensive postmenopausal women (HPMW). Eleven obese HPMW (BMI: 30.7 Â± 1.3 kg/m2; age: 61 Â± 2 years) were assigned to ingest 6g of CIT or placebo on different visits. Forty-five minutes after ingestion, participants performed a 6-minute low-intensity (20% strength) plantarflexion exercise. During the last 3 minutes of exercise, the participant's right hand was introduced into cold water (~4ÂºC). Brachial and aortic BP responses were measured at baseline and the 2nd minute of Ex and Ex+CPT. No differences (p > .05) were found between CIT and placebo in baseline brachial systolic BP (126 Â± 4 vs 124 Â± 3 mmHg) and the increases in brachial systolic BP (Î14 Â± 3 vs Î14 Â± 3 mmHg), brachial mean arterial pressure (MAP) (Î12 Â± 3 vs Î10 Â± 2 mmHg), and aortic systolic BP (Î13 Â± 3 vs Î12 Â± 2 mmHg) from baseline to Ex. CIT attenuated increases in brachial systolic BP (Î27 Â± 3 vs Î38 Â± 3 mmHg, p < .05), brachial MAP (Î20 Â± 3 vs Î30 Â± 3 mmHg, p < .05), and aortic systolic BP (Î26 Â± 3 vs Î36 Â± 3 mmHg, p < .05) from rest to Ex+CPT vs placebo. Acute ingestion of CIT attenuates the exaggerated BP responses to exercise and cold stress in obese HPMW.

Link to presentation: https://www.youtube.com/watch?v=pD962IGGeL8

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Kalhara Menikdiwela

Western diets, characterized by higher amounts of saturated fats and fatty proteins, has been suggested to contribute to metabolic diseases, through low-grade metabolic acidosis (low pH). Our objective was to test the effects of diets rich in beef prepared at various pH levels, in diet induced obese mice. We hypothesized that metabolic health will be improved by consuming a diet containing pH-enhanced beef, compared to a non-pH-enhanced beef diet. B6 male/female mice were randomized into 6 groups; low fat (LF), pH-enhanced LF (LFN), high fat (HF), pH-enhanced HF (HFN), HF beef (HFB), pH-enhanced HFB (HFBN). Weight gain/ food intake were measured. Tissues (white adipose tissue (WAT), liver) were collected and used for histology, gene and protein analyses. Results: Final body weight was significantly higher in HF group compared to LF, LFN groups in males, but not in females. Moreover, glucose clearance was significantly better in LF groups compared to HF group for both male and females. Male WAT had smaller fat cell size, and greater fat cell number (p< 0.05) in HFN and HFBN compared to HF and HFB respectively. HFBN showed less hepatic fat accumulation in male mice compared to HFB group. Conclusions: Findings suggest that there are potential metabolic benefits of increased dietary pH, through improved glucose clearance and fat metabolism. However, additional research is required to determine the underlying mechanisms. These results can be further translated to human subjects to understand interactions between beef, pH and fat content on metabolic diseases.

Link to presentation: https://www.youtube.com/watch?v=rS_6KXaEQms

Tariful Islam

Obesity is a complex metabolic disease, that is often associated with non-alcoholic fatty liver disease (NAFLD). Inflammation is a common feature of both diseases. Curcumin, a traditionally used spice in Asia, exerts anti-inflammatory effects in liver and white adipose tissue (WAT) of diet-induced obese (DIO) mice. However, mechanisms involved in these beneficial effects remain obscure. Zinc is an important micronutrient involved in inflammatory responses. Zinc homeostasis is maintained mainly by zinc transporters known as Znt and Zip family. The objective of this research was to determine curcumin's effects on inflammatory markers and zinc transporters in the liver and WAT from DIO mice. Male B6 mice were fed a HFD (45% kcal fat) or HFD supplemented with 0.4% (w/w) curcumin (HFC) for fourteen weeks. Serum triglycerides (TG) and free fatty acid (FFA) levels were measured. mRNA levels for inflammatory markers and zinc transporters were determined in WAT and liver by qRT-PCR. No significant changes were observed in body weight, serum TG and FFA levels with curcumin supplementation. However, inflammatory gene markers was significantly reduced in liver and WAT from the HFC group compared to HF ($p < 0.05$). Furthermore, curcumin reduced hepatic zinc transporters Zip10, Zip14, and Znt10. In WAT, curcumin significantly reduced mRNA levels for Zip1, Zip14, Znt1, and Znt7 ($p < 0.05$). Our results indicate that zinc transporters may in part mediate the anti-inflammatory properties of curcumin, particularly Zip14, in WAT and liver of DIO mice. Future mechanistic studies are necessary to establish our findings.

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Flavia Sardela de Miranda

Obesity, a recognized risk factor for breast cancer (BC), is associated with expansion of white adipose tissue (WAT) and reduced brown adipose tissue (BAT). Markers of WAT include inflammatory markers such as CD68 while BAT markers include the uncoupling protein 1 (UCP-1). Obesity has been associated with overexpression of renin-angiotensin system (RAS) components in adipose tissue such as angiotensinogen (AGT). Therefore, RAS inhibitors (RASi) have been proposed as potential therapeutic options for BC patients, which benefit those with obesity. Thus, we aimed to evaluate the associations between body mass index (BMI), cancer aggressiveness (i.e. Ki67) and RASi among BC patients in a retrospective analysis. Sixty-seven patients were recruited at TTUHSC. Data collected included BMI, Ki67, BC type, percentage of tumor infiltrating lymphocytes (%TILs) and RASi use. Linear cross-correlations between continuous measures were examined. Continuous variables were compared via Welch t-tests and Kruskal-Wallis test. Histological examinations of breast tissue biopsies were performed after immunostainining for UCP-1, CD68 and AGT. Ki67 correlated with %TILs ($r = 0.2614$, $p = 0.0255$). The basal subtype of BC was more aggressive than Luminal A or B subtypes (ps = 0.0001 and 0.0170 respectively, FWER adjusted). Ki67 was significantly lower among RASi users vs. controls ($p = 0.0131$). Immunostaining revealed heterogeneous expression of all markers tested. Increased aggressiveness of basal BC and the association between BC aggressiveness and %TILs substantiated prior findings. The reduction in BC aggressiveness with RASi use warrants further exploration, especially to outline the possible mechanisms driving these findings.

Link to presentation: https://www.youtube.com/watch?v=R1VJBKrlA4s

Fahad Bin Mostafa

Due to an excessive amount of body fat (BMI>30), the human body turns obese and causes many complex diseases with high blood pressure, high risk of heart disease, diabetes, and certain cancers. So, diagnosis of obesity level from medical reports becomes a major concern. Methods: In this study, some Statistical Machine Learning (SML) methods such as Artificial Neural Network (ANN) and Random Forest (RF) had been proposed to classify the different level of Obesity and no-obesity based on age, height, weight, family history, lifestyle, etc. and few other related attributes. The data set included 7 different obesity levels; insufficient weight, normal weight, overweight-1 or 2, obesity type-1, 2, or 3. Data visualization had been done to explore and identify missing data and trends. SML model was compared with Multinomial Logistic Regression (MLR) with confusion matrix with train sets and verified through ROC curves with test sets. A 10-fold cross-validation technique was applied to verify with found results. Results: A 51.08% accuracy had been found in MLR which was relatively less than RF; accuracy 64.93%. On the other hand, the deep learning technique-ANN showed less performance (57.60%) than RF, but more than the accuracy of MLR. According to the confusion matrix, some misclassification of obesity levels was found. Conclusions: Proposed SML tools can replace the traditional statistical method to classify the level of Obesity more accurately. RF led the result compared to ANN and MLR. So, health professionals can diagnose medical conditions, and predict diseases such as Obesity by using SML.

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Shadi Nejat

The prevalence of obesity and Type 2 Diabetes (T2D) continues to rise worldwide, leading to many other chronic diseases and imposing a large economic burden. Obesity is associated with chronic inflammation and excess body fat. Heat Shock Protein-40 (HSP40 or DNAJ) subfamily B, member 3 (DNAJB3), is a chaperone protein that can be induced under various stressors. DNAJB3 is downregulated in some patients with obesity/T2D, suggesting a potential role of this protein in protecting against these diseases. However, precise underlying mechanisms remained unclear. We hypothesized that lack of DNAJB3 will increase body weight and body fat, inflammation, glucose intolerance and insulin resistance in diet-induced obese mice, compared to B6 wild type (WT) littermates fed the same diets. We generated DNAJB3 knockout (KO) lines using CRISP-CAS 9 technology. These mutants exhibited different phenotypes, one of which was consistent with downregulation of DNAJB3 in humans with obesity. KO 47 had higher body weight and fat mass, compared to WT mice. Additionally, a slower glucose clearance rate was observed in KO 47 fed high fat diets compared to WT littermates on the same diets. Additionally, mRNA levels of pro-inflammatory cytokines (TNF-a and MCP-1) were higher in adipose tissues of KO 44 and 47 males compared to WT mice. Overall, this research will identify mechanisms by which DNAJB3 deficiency leads to metabolic dysfunctions. Our preliminary findings suggest that DNAJB3 plays important metabolic roles, which warrants further research as a potential therapeutic target for obesity and T2D.

Link to presentation: https://www.youtube.com/watch?v=sawYl0VcZpA

Afrina Hossain Rimu

We examined the association of weight status (i.e., overweight/obese, OWOB; vs. normal weight, NW) with measures of pain/discomfort/enjoyment (PDE) at baseline and during an exercise protocol (Physical Activity Discomfort Test Battery, PADT). This cross-sectional study included 127 adults (NW/OWOB; BMI â¥18.5 vs. â¥25 kg/m2). Before PADT subjective pain was measured using Short Form McGill Pain Questionnaire (SFMPQ), West Haven-Yale Multidimensional Pain Inventory (WHYMPI), Subjective Pain Rating Scale (SPRS), and Short Form Brief Pain Inventory (SFBPI). PDE was evaluated using Rate of Perceived Exertion (RPE), Feeling Scale (FS), Subjective Discomfort Scale (SDS), Physical Activity Enjoyment Scale (PAES), and SPRS at baseline and during PADT. Dolorimetry measured pre- and post- exercise objective pain. Exercise discontinuation time (DisT) was noted. Outcomes with missing data were handled via multiple imputation with predictive mean matching. t-tests were used for NW/OWOB differences in baseline SFMPQ, WHYMPI, SFBPI, SPRS; DisT; and baseline and change scores of DO and PDE measures. Results: No significant differences were found between OWOB vs. NW for baseline SFMPQ, WHYMPI, SFBPI, SPRS, PADT, and DO (ps > 0.11), except, OWOB had higher pain score on Outdoor Work (OW) in WHYMPI (p = 0.03). Change scores of PDE scales and DO were not significantly different between OWOB and NW (ps > 0.10). No association was found between DisT and weight status. Adequately powered comparison of OWOB vs. NW on multidimensional measures of pain/discomfort/enjoyment during exercise challenge suggests that people with/without obesity do not have significantly different experiences on these dimensions.

Link to presentation: https://www.youtube.com/watch?v=oQCP63i8kgs

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Samuel Uche

Obesity has been growing in prevalence throughout the world with associated high costs, increased chronic health conditions, and reduced quality of life. It appears to be a complex problem with multiple causes. Researchers from different disciplines often pursue numerous, divergent approaches. To seek to disentangle this complexity, we use the socio-ecological model (SEM) to organize factors in the literature that are associated with obesity at multiple levels. We carry out a systematic review of systematic reviews to summarize existing knowledge and uncover missed areas of research. This study conducted a systematic review and narrative synthesis to show the influence of factors on obesity and also an interaction between levels of determinants. The literature search was conducted for all systematic review articles published between 2000 to 2020. The narrative synthesis was conducted for 84 papers grouped based on the four levels of the SEM. In this scoping review, 66.32% addressed the individual level, 35.05% the interpersonal level, 28.87% the community level, 18.56% the policy level. This paper synthesized the effect size of different factors and interventions on obesity and found factors that may be associated with obesity. The individual level of determinant, of all levels of the SEM, is the most studied. Studies that incorporate interactions between the genetic and environmental level showed that this interaction is a viable pointer to address the difference in the development of obesity among individuals living in the same environment.

Link to presentation: https://www.youtube.com/watch?v=C9cTeyz1NAY

Rachel Washburn

Pancreatic islet transplants are performed to treat diabetes mellitus (DM) and normalize blood glucose levels without exogenous insulin. This can improve and save lives; however, there is a severe shortage of transplantable organs. Xenotransplantation offers an endless supply of tissue, but hyperacute rejection of xenografts is a concern. Thus, immunosuppressive drugs are prescribed to prolong transplant survival, yet long-term administration causes harsh side effects. Hyperacute rejection occurs through antibody activation of the complement system, an enzymatic cascade culminating with cell lysis through insertion of the membrane attack complex (MAC) pore. Sertoli cells (SCs), an immunoregulatory cell in the testis, survive hyperacute rejection without pharmaceutical immunosuppressants by creating an immune privileged environment. Human serum/complement cytotoxicity assays confirmed that neonatal porcine SCs (NPSCs) survive complement. Immunohistochemistry of NPSCs exposed to complement showed no MAC deposition. Quantification of complement inhibitory protein (CIP) mRNA and protein expression through qPCR and western blot revealed that NPSCs express the CIPs CD46 and CD55. shRNA was used to knockdown expression of CD46 and CD55 in NPSCs, and survival of these cells was diminished to under 10% after exposure to activated complement. These results suggest that CD46 and CD55 are critical to NPSC survival of complement in vitro. We intend to further investigate other CIPs expressed by NPSCs and confirm their role in SC survival of complement. Data gained from these experiments will be critical in determining the mechanism(s) of SC immune privilege and could increase islet xenograft viability to treat DM in patients.

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Adam Wynn

While the often-purported claim that coconut fat is beneficial for cardiovascular health was disputed in a recent comprehensive meta-analysis, evidence on the effects of coconut fat consumption on glycemic control remains equivocal. We conducted a systematic review and meta-analysis to determine the effects of dietary coconut fats on markers of glycemic control. Predefined keywords were used to search for relevant studies and records were screened using pre-determined eligibility criteria. Data was extracted and DerSimonian Liard random effects meta-analyses were conducted using meta package in R (4.0.2). Meals containing coconut fat significantly increased incremental area under the curve (AUC) of glucose ($\square$ = 162.48 mg x min/dL, p = 0.046) and significantly decreased incremental AUC of insulin vs. control meals ($\square$ = -459.13 mIU x min/L, p = 0.037). Furthermore, coconut fat-containing meals significant increased fasting blood glucose vs. control meals ($\square$ = 2.73 mg/dL, p = 0.0162). There were no significant differences in fasting insulin or homeostasis model assessments for insulin resistance (HOMA-IR) or $\square¢\square¢\hat{I}^2$-cell function (HOMA-$\square¢\hat{I}^2$) between coconut fat vs. control groups. Dietary coconut fat seems to be associated with a decreased post-prandial insulin response, possibly causing a minimal, yet increased post-prandial glycemic response. Coconut oil does not seem to have long-term benefits for glycemic control. These results disprove the popular claims that coconut fat improves glycemic control.

Link to presentation: https://www.youtube.com/watch?v=CWjXc79Gm78

Mahsa Yavari

Alzheimer's disease (AD) is a degenerative brain disease characterized by development of amyloid-beta ($A\beta$) plaques. We previously showed that Eicosapentaenoic acid (EPA), exerted anti-obesity and anti-inflammatory effects in diet-induced obese (DIO) mice. Here we hypothesize that EPA will reduce adiposity and neuroinflammation in DIO, AD mouse model. Two-month-old male and female APPswePS1E9 transgenic (TG) and non-TG littermates were randomly assigned to low fat (LF), high fat (HF), or HF supplemented with EPA diets for eight months. Body weights were recorded weekly, blood and tissues were harvested at termination. Serum amyloid $A\beta$-40, leptin, adiponectin, and resistin levels were quantified by Multiplex assays. On average, TG mice had higher $A\beta$-40 in serum ($p < 0.05$) compared to non-TG mice in both males and females; $A\beta$-40 concentration did not differ by sex. However, serum leptin and resistin were higher in males vs females ($p < 0.001$). Adiponectin did not differ by sex ($p = 0.1897$) and no adipokine differed by genotype. Interestingly, in TG males, compared to HF, EPA decreased serum $A\beta$-40, leptin, and resistin ($p = 0.0182$, $p = 0.0086$, $p=0.0051$ respectively). Moreover, in non-TG male mice, EPA increased serum adiponectin compared to HF ($p = 0.0342$) and no other interactions were significant. EPA reduced adiposity, resistin, and serum $A\beta$-40 in HF-fed TG male mice. Additional analyses are ongoing. These findings warrant future studies in humans to determine whether consumption of high doses of fish oil may benefit patients with AD.

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Mohammad Yosofvand

Detecting breast cancer cells in the early stages can be a significant step in medical treatments. Immune cells, particularly Stromal Tumor-infiltrating Lymphocytes (sTILs), can recognize and kill cancer cells. sTILs are reported as a percentage, which refers to the percentage of stromal area occupied by mononuclear inflammatory cells over the total stromal area within the tumor. The increasing importance of sTILs as a measure of an importance biomarker in breast cancer research, prognostication, and management with potential utilization as a proxy outcome measure necessitates an accurate and reproducible reporting by pathologists. Therefore, by accurately measuring the sTILs within the tumor, doctors can predict whether patients live longer and respond to cancer treatments.

Currently proposed manual scoring of sTILs is cumbersome and may vary between pathologists. Advances in machine learning, Feedforward Artificial Neural Network (FFANN) and Convolutional Neural Network (CNN) provide an ideal platform for demonstration of reproducibility of sTILs scoring. We propose to develop these machine learning systems to overcome the discrepancy in sTILs scoring, solve the problems associated with visual reporting and other technical factors, and to score these immune cells automatically and precisely. This proposed machine learning systems will greatly enhance our ability to promptly design, diagnose, target, and predict patent response to treatment.

Link to presentation: https://www.youtube.com/watch?v=ZEZcgnmUEfg

Thank you for participating in the ORI 2021 Annual Meeting & Competition!

Program & Abstracts

The TTU ORI Annual Meeting Team

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Acknowledgments

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TEXAS TECH UNIVERSITY
Obesity Research Institute

Values

- Integrity & trust
- Respect for interdisciplinary teamwork & diversity
- Mentoring & Training
- Compassion & dedication
- Multidisciplinary & dynamic knoledge development & dissemination

History

The Obesity Research Institute at Texas Tech University was originally initiated by Dr. Moustaid-Moussa in 2013 as the Obesity Research Cluster. The Board of Regents approved establishing the Obesity Research Institute in 2019 with Moustaid-Moussa as the founding director and Jannette Dufour as the associate director.

Naima Moustaid-Moussa

Jannette Dufour

The Obesity Research Institute reports to the Vice President of Research & Innovation. Research collaborators include Texas Tech Health Sciences Center Schools of Nursing, Medicine, Biomedical Sciences, & Health Professions.

Vision

Achieve national leadership & recognition in interdisciplinary obesity research & education.

Objective

- Boost productive collaborations within the Texas Tech University System
- Foster strong mentoring to carrer scientists, post docs, and students on all levels in basic, clinical, and community research broadly related to obesity and chronic diseases

Mission

Develop interdisciplinary basic, clinical, and community translational research to prevent and treat obesity along with its related complications using innovative collaborations and strategic partnerships.

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