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May 11th, 9 a.m.-2 p.m.  
Via Zoom

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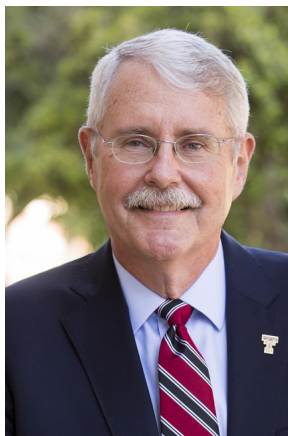
**Obesity Research  
Institute**

# Agenda

<b>9:00-9:05 A.M.</b>	<b>Welcome</b> Joseph A. Heppert, Ph.D., Vice President of Research & Innovation, TTU Lance McMahon, Ph.D., Senior Vice President of Research & Innovation, TTUHSC
<b>9:05-9:15 A.M.</b>	<b>ORI and Program Overview</b> Naima Moustaid-Moussa, Ph.D., FTOS, FAHA, Director of Obesity Research Institute Jannette Dufour, Ph.D., Associate Director of Obesity Research Institute
<b>9:15-9:45 A.M.</b>	<b>Panel #1: Integrated Bariatric Care</b> Vinay Goyal, MD                      Bariatric Surgery: What is it and Why I do it? Patrick Randolph, Ph.D.            Integrated Bariatric Care: The Whole Enchilada
<b>9:45-9:55 A.M.</b>	<b>Panel #1 Q&amp;A</b> Moderated by Gurvinder Kaur, Ph.D.
<b>9:55-10:55 A.M.</b>	<b>Panel #2: Mental Health &amp; Wellness Across the Lifespan</b> Nancy Trevino, Ph.D.              Collaborative Effort to Address Mental Health and Wellness Miquela Smith, MPH              Impact of Adverse Childhood Experiences on Health Outcomes in Adulthood Amber Wersonske, LPC            Settling the Score: Healing the Body Through Mindfulness and Self-Care Thomas Kimball, Ph.D., LMFT    The Essentials of Mental Health Recovery
<b>10:55-11:10 A.M.</b>	<b>Panel #2 Q&amp;A</b> Moderated by Conrad Lyford, Ph.D.
<b>11:10-11:55 A.M.</b>	<b>Student Poster Competition</b> <b>Mindful Meditation led by Brian Quinn, MA, MS</b>
<b>11:55 A.M.- 12:40 P.M.</b>	<b>Panel #3: Evidence Based Mind-Body Connection</b> Sarah Wakefield, MD              The Whole Body Response to Toxic Stress Kendra Rumbaugh, Ph.D.        How Nutrition Influences the Gut-Brain Axis Caroline Cummings, Ph.D.       Pediatric Overweight and Obesity: Treating the Whole Body
<b>12:40- 12:50 P.M.</b>	<b>Panel #3 Q&amp;A</b> Moderated by Temitope Ibiyemi and Shadi Nejat, DC
<b>12:50-1:00 P.M.</b>	<b>Closing Remarks</b>
<b>1:00-2:00 P.M.</b>	<b>Student Development Session: Valuable Insights from Industry (Sponsored by GNO)</b> Phil Sizer, PT, Ph.D., FAAOMPT Dylan Bailey, MS, RD, FAND Nalin Siriwardhana, Ph.D., FACN <b>Poster Award Presentations</b>

**Awards for the Student Poster Competition were sponsored by:**





## Joseph A. Heppert, Ph.D.

### Vice President for Research & Innovation, Texas Tech University

Dr. Heppert is currently Vice President for Research and Innovation at Texas Tech University (TTU). His office is responsible for fostering research, scholarship, and creative activity at TTU; for promoting innovation, entrepreneurship, and technology transfer programs; and for regulatory oversight of research compliance and scholarly integrity. 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 on the American Chemical Society's Committee on Budget and Finance, and is on the institutional advisory board for the Cancer Prevention and Research Institute of Texas. 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 Garies. He completed postdoctoral training at Indiana University under the direction of Dr. Malcolm Chisholm. He joined the chemistry faculty at KU in 1985 and moved to Texas Tech University in 2017

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## Lance R. McMahon, Ph.D.

### Senior Vice President for Research and Innovation, Texas Tech University Health Science Center

Lance R. McMahon, Ph.D., is the Senior Vice President for Research and Innovation at Texas Tech University Health Sciences Center. He has a faculty appointment as Professor of Pharmaceutical Sciences in the Jerry H. Hodge School of Pharmacy. Dr. McMahon also serves as Chair of the TTUHSC Research Council, Member of the Texas Tech Research Park Board, and Steering Committee of the Center for Translational Neuroscience and Therapeutics. Dr. McMahon brings experiences from his former position as professor and chair of the Department of Pharmacodynamics at the University of Florida College of Pharmacy. For two decades he has been continuously funded by the National Institutes of Health for a total of \$22M to conduct research in behavioral pharmacology and CNS drug discovery and development. He is firmly committed to building strategic research partnerships and achieving excellence at TTUHSC through fostering collegial spirit, a shared vision, and strategic investment of university funds.



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## Dr. Naima Moustaid-Moussa, Ph.D., FTOS, FAHA

### **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 TTU Obesity Research Institute. She leads the Nutrigenomics, Inflammation and Obesity Research (NIOR) conducting basic and integrated nutrition and obesity research, with emphasis on the endocrine function of adipose tissue (renin angiotensin system) and nutrient-gene interactions in metabolic diseases, breast cancer, aging and Alzheimer's disease.

Current research focuses on bioactive compounds (such as fish oil, tart cherry anthocyanins, curcumin, and other polyphenols) reduce obesity-associated white fat inflammation and activate brown fat, using cells, rodents, and model organisms. Her secondary area of interest is in obesity prevention. She published over 170 peer reviewed papers from work funded by federal agencies (NIH and USDA), foundations (AHA, ADA) and international Foundations (Qatar) as well as industry. She served in several leadership positions within the American Society for Nutrition (ASN, currently as member of the ASN Board of Directors), The Obesity Society (TOS Council), and the American Heart Association (AHA, Lipids Basic Science peer review committee chair). She currently serves as a member (2016-2022) of the NIH Human Studies of Diabetes & Obesity, and as member of several scientific journal editorial boards including Scientific Reports (Nature Springer), J. Nutritional Biochemistry (Elsevier) & JAHA (Wiley)) and is Associate Editor for Nutrition Reviews. Dr. Moustaid-Moussa is Fellow of AHA (FAHA) and Fellow of TOS (FTOS). She received several awards sponsored by ASN (2012 Outstanding Investigator award, 2015 Pfizer Consumer Healthcare Nutritional Sciences award, 2020 Korean Nutrition Society Award). She was also awarded mentoring and scholarship awards by TTU (2018 Nancy J Bell Outstanding Mentor Award, 2019 Outstanding Faculty Mentor for Undergraduate Research, 2020 Outstanding Researcher Award). In 2021, she received the Bernie E. Rushing J. Distinguished Faculty Research Award and appointed as Paul W. Horn Distinguished Professor. She serves the state of TX as Region 1 representative on the statewide Live Smart Texas, a statewide committee dedicated to obesity prevention and resources. Nationally, she was appointed in 2022 to the National Academies of Sciences, Engineering & Medicine's Board of Agriculture & Natural Resources.





## 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 PhD 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 to explore 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 and 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 and has been selected for the cover photo for Cell Transplantation (2008). Spermatogenesis (2012) and DNA and Cell Biology (2018) and highlighted in Biology of Reproduction (2014) and Nature Medicine (2018). She has been invited to give seminars at several universities as well as at national and international meetings, including 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).



# ORI Organizing Committee Members

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**Conrad Lyford, Ph.D.**

**Professor, Dept of Agriculture and Applied Economics, 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.

**Theresa Byrd, Ph.D., MPH, RN**

**Chair & Associate Dean of the Department of Public Health  
Texas Tech University Health Science Center**

Theresa Byrd, DrPH, MPH, RN, is Chair and Associate Dean of the Department of Public Health. She previously held the position of Professor of Medical Education and Professor in the Department of Family and Community Medicine at TTUHSC-PLFSOM. She has spent most of her career working with US-Mexico border and migrant populations. She has been involved in several projects aimed at understanding the attitudes and beliefs of Hispanic women, and has participated in the development of interventions to change health behavior. In a CDC funded project she and her colleagues developed a theory-based intervention to increase cervical cancer screening in Hispanic women, which was found to be highly effective in a clinical trial. She has also been involved in the development of an intervention to increase colorectal cancer screening, an intervention to help men make decisions about prostate cancer treatment, and the development and testing of a CD-ROM on cancer genetics for Hispanic women.



**Yujiao Zu, Ph.D.**

**Research Assistant Professor Texas Tech University**

Dr. Yujiao Zu is a Research Assistant Professor in the Department of Nutritional Sciences at Texas Tech University (TTU). Yujiao received her B.S. in Biological Engineering and M.S. in Food Sciences at Tianjin University of Science and Technology in China, and Ph.D. followed by a post-doctoral fellowship in Nutritional Sciences at TTU. Her research focused on investigating interactions and underlying mechanisms between dietary components (such as omega-3 fatty acids, tart cherry extract and other polyphenols) and obesity-associated disorders, especially in-

flammation and diabetes. She also involved in projects to improve metabolic health through thermogenic fats activation and lifespan prolongation by phytochemicals. She has research expertise in molecular and cellular biology, technique in analytical chemistry, and experiences with cell and animal models.

# Speakers

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## Vinay Goyal, MD

### **Assistant Professor of Surgery, Minimally Invasive and Bariatric Surgery, Texas Tech Health Science Center**

Dr Goyal is a fellowship trained minimally invasive general and bariatric surgeon. He completed his fellowship in Advanced MIS GI and Bariatric Surgery at Penn State University in 2014. Apart from advanced laparoscopy, he is also proficient in robotic and endoscopic procedures. His clinical interests include bariatric surgery, acid reflux disease (GERD), gastroparesis, achalasia, tumors of stomach/intestine/colon and hernias.



## Pat Randolph, Ph.D.

### **Therapractic Management Systems**

Pat Randolph is a Health Psychologist with numerous scholarly articles and publications, many addressing treatment outcomes that integrate medical and behavioral health care. He has directed behavioral health clinics over 30 years including the Pain Center of TTUHSC. Dr. Randolph is the CEO of Therapractic Management Systems, a software development and service company interfacing behavioral health in medical, correctional and university settings.

## Nancy Trevino, Ph.D.

### **Director, Texas Tech Mental Health Initiative**

Nancy Trevino currently serves as the Director of the Texas Tech Mental Health Initiative at Texas Tech University Health Science Center where she works to coordinate and build collaborations for research, training, and clinical services across the community in an effort to improve health and wellness. Prior to accepting this new role in the Department of Psychiatry at TTUHSC, she worked in positive youth development programming, prevention education, program evaluation and grant writing. She is a certified instructor for Mental Health First Aid and Youth Mental Health First Aid with designations in emergency medical services, higher education, and rural communities. Dr. Trevino is a West Texas native and a TTU alumna who has earned her bachelor's, master's and doctoral degrees in Human Development and Family Studies with a minor in Cross-Cultural Studies. She also serves on numerous Lubbock-area and state-wide boards and committees. In her time away from the office, she can be found spending time with her family playing games, watching movies, and traveling.



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## Miquela G. Smith, MPH

### Healthy Texas Specialist, Texas A&M Agrilife Extension Service

Miquela Smith has served as a health specialist for Texas A&M AgriLife Extension Service since 2018. Miquela's work focuses on chronic disease prevention, health promotion, and disaster resiliency and recovery. She supports Family & Community Health Extension Agents throughout the state and is certified to instruct youth and adult Mental Health First Aid courses. Miquela currently serves as a Co-Principal Investigator for a grant awarded by the Texas Department of State Health Services to address the needs of communities who have been disproportionately affected by COVID-19 and chronic diseases. Prior to joining Texas A&M AgriLife Extension Service as an Extension Agent in 2016, Miquela worked as an Associate Scientist at the University of New Mexico Comprehensive Cancer Center. She currently serves on the Panhandle Area Health Education Center board and also teaches Epidemiology at West Texas A&M University. Miquela earned a B.A. in Psychology and Spanish from Trinity University (2009) and an M.P.H. with a concentration in Epidemiology from the University of New Mexico (2014).



## Amber Wersonske, LPC

### Licensed Professional Counselor Mindful Journey Counseling and Wellness

Amber Wersonske is a Licensed Professional Counselor. She received her bachelor's degree in psychology from Baylor University and went on to earn her master's degree in counseling from the University of Texas at San Antonio. After graduation, Amber was privileged to begin her work as a detention counselor at Bill Logue Juvenile Detention Center, working with at-risk youth and their families. Amber went on to work as a psychotherapist at Moody Neuro (formerly the Transitional Learning Center), a non-profit neuro rehabilitation facility in Lubbock, TX. For the past three years, Amber has been working in Dallas with juvenile victims of human trafficking. Currently, Amber is working with a variety of clients at the group practice Mindful Journey Counseling and Wellness in Plano, TX. Amber has experience working with adolescent and adult populations that have experienced trauma such as abuse, complex trauma, sexual exploitation, and traumatic brain injury.

## Thomas Kimball, Ph.D., LMFT

### George C. Miller Family Regents Professor, Director- Center of Collegiate Recovery Communities, Texas Tech University

Thomas G. Kimball, Ph.D., LMFT, is the George C. Miller Family Regents Professor at Texas Tech University and the Director of the Center for Collegiate Recovery Communities. He is the author of several peer reviewed articles on addiction, recovery, and mental health and presented on recovery related topics internationally. He is the co-author of the book, Six Essentials to Achieve Lasting Recovery. Dr. Kimball has been married to Melissa for 31 years, has five children, and two grandchildren (Freddie and Ben).







## Sarah Wakefield, MD

### **Associate Professor and Chair, Texas Tech University Health Science Center**

Dr. Wakefield is a board certified adult, child/adolescent, and forensic psychiatrist. She attended medical school at the University of Texas Medical Branch in Galveston, Texas and a general psychiatry residency at Louisiana State University School of Medicine in Shreveport. Dr. Wakefield completed a fellowship in child and adolescent psychiatry and an additional fellowship in forensic psychiatry also at LSU Health before joining the faculty at Texas Tech University School of Medicine

in 2014. She has served as the Director of Child and Adolescent Psychiatry Services and since 2016 and the Medical Director of Medical Ethics until 2020. She is currently a chair of the Department of Psychiatry at Texas Tech University School of Medicine and is active in providing psychiatric diagnostic and treatment evaluations for families, for adolescents in the juvenile justice system, and for pregnant or post-partum mothers. Dr. Wakefield is most interested in helping families find their way to understanding, acceptance, and wellness and in ending the school to prison pipeline by intervening at the community level as early as possible.

## Kendra Rumbaugh, Ph.D.

### **Associate Professor, Texas Tech University Health Science Center**

Kendra Rumbaugh received her PhD in Medical Microbiology from the Texas Tech University Health Sciences Center (TTUHSC) and performed postdoctoral training at the University of California at San Francisco, both in the area of bacterial pathogenesis. She is a tenured Professor in the Department of Surgery at TTUHSC, in Lubbock, Texas with joint appointments in the Depts. of Cell Biology and Biochemistry and Immunology and Molecular Microbiology. She is co-Director of the Burn Center of Research Excellence at TTUHSC and teaches a graduate course in Microbiome in Health and Disease. Dr. Rumbaugh's research focuses on understanding and treating wound infections, and she is especially interested in how biofilms, polymicrobial interactions and cell-to-cell signaling contribute to infection.



## Caroline Cummings, Ph.D.

### **Assistant Professor, Texas Tech University**

Dr. Caroline Cummings is an Assistant Professor of Psychology at Texas Tech University. Dr. Cummings devotes her clinical and research efforts towards assessing and treating adolescents and emerging adults with complex and chronic illnesses. Using a biopsychosocial framework, her work emphasizes the role of physiological, behavioral, and subjective indices of affect and self-regulation, and their interdependencies within social relationships, in understanding daily and momentary engagement in obesity-related health behaviors. She has extended her work to examine and address health disparities,

with the goal of developing culturally informed digital health technologies to increase access to care for historically underserved populations. She has multiple peer-reviewed scientific publications and has presented at national scientific conferences. Most recently, she co-authored a publication regarding the impact of COVID-19 related fears and their relationship to daily physical activity and dysregulated eating in adolescents.

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# Moderators

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## Gurvinder Kaur, Ph.D.

### **Assistant Professor, Texas Tech University Health Science Center**

Dr. Gurvinder Kaur is currently an Assistant Professor in the Department of Medical Education, School of Medicine, Texas Tech University Health Sciences Center, Lubbock, TX. Dr. Kaur serves as a Co-Block Director or an Associate Block Director for several School of Medicine Phase 1 curriculum blocks. She also serves as the Co-Director for several Graduate Medical Education Sciences courses. She has received the President's Excellence in Teaching award, Student Government Association-Outstanding Faculty of the year (2020-21 and 2021-22), President's Team-Teaching award for the Clinically Oriented

Anatomy block, Dean's Basic Science Teaching award for Year 1, and President's Team-Teaching Award for FMAT course. Her research is focused on transplantation and diabetes and has been funded by several agencies including The CH Foundation, Ted Nash Long Life Foundation and Jasper & Jack Wilson Foundation. Her research has been highlighted in Nature Medicine, Biology of Reproduction and selected for the cover photo for Spermatogenesis and DNA and Cell Biology journals.

## Conrad Lyford, Ph.D.

### **Professor, Dept of Agriculture and Applied Economics, 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.



## Temitope Ibiyemi

### **Graduate Student President, Graduate Nutrition Organization**

Temitope Ibiyemi is a Third-year Doctoral student in Nutritional Sciences under the mentorship of Dr. Wilna Oldewage-Theron. Before joining Dr. Oldewage-Theron's Community Nutrition and Health Interventions (CNHI) Lab, Temitope completed his Master's degree in Human Services from Texas Southern University in Houston and a Bachelor's degree in Food Technology from Nigeria. Temitope's current endeavors as a Public Health Nutritionist include developing nutrient-dense food products for malnourished communities and conducting evidence-based nutrition education programs for limited-resource and vulnerable population groups.

## Shadi Nejat, DC

### **Graduate Student, Vice President, (President Elect) of the Graduate Nutrition Organization**

Shadi Nejat is pursuing a Ph.D. in Nutritional Sciences under the mentorship of Dr. Naima Moustaid-Moussa. She earned her B.S. in Biology from the University of Texas at Arlington. Shadi has a Doctorate of Chiropractic degree from Parker University and worked as Chiropractor for 12 years prior to joining the Nutrigenomics, Inflammation and Obesity Research Laboratory.



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## Mindful Meditation in Practice

### **Brian Quinn, M.A., M.S.**

Librarian: Research, Instruction & Outreach

Brian is a registered yoga teacher and certified meditation teacher. He publishes and presents scholarly research on yoga and meditation. Brian teaches a yoga and meditation class Sunday evenings at the TTU Recreation Center.

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# Student Development Session (SDS): Valuable Insights from Industry Professionals

Presented by Graduate Nutrition Organization

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## Phil Sizer, PT, PhD, FAAOMPT

**Fellow, American Academy of Orthopaedic Manual Physical Therapists, TTUHSC President's University Distinguished Professor, and Endowed Professor in Pain Science, TTUHSC Associate VP for Research Innovation**

Phil Sizer PT, Ph.D., is an Endowed Professor in Pain Science, TTUHSC President's University Distinguished Professor, Associate Vice President of Research Innovation, and the Associate Dean for Research for the School of Health Professions. Phil is a senior faculty in the ScD Physical Therapy, Ph.D. in Rehabilitation Sciences, and Medical Pain Fellowship Programs at TTUHSC. Phil earned his BS in PT from UTMB-Galveston (1985), as well as his MEd in Exercise Science (1993) and Ph.D. with a Motor Control emphasis (2002) at TTU. Phil also earned a Post-Professional Fellow in Orthopaedic Manual Physical Therapy (2002). Phil is an acclaimed researcher/scholar/lecturer/innovator/clinician serving the West Texas community for over 35 years. His research collaborates with six different universities worldwide. His recent work has been in research commercialization. He is a co-inventor of the patent-pending Tis-Kin™ technology and a co-founding partner and CEO of TKQuant, LLC. Phil serves as an Ex-Officio board member to the Texas Tech Research Park. Phil is strongly committed to TTUHSC'S mission to transform healthcare through innovation and collaboration. He is leading TTUHSC research commercialization and entrepreneurship efforts by facilitating programs, mentoring teams, and developing partnerships to provide opportunities that grow the next generation of healthcare innovators and leaders.



## Dylan Bailey, MS, RD, FAND

**Senior Nutrition Specialist, Ketchum**

Dylan is a Senior Nutrition Specialist with Ketchum and Fellow of the Academy of Nutrition and Dietetics who works across nutrition, food, beverage, ingredient, agriculture and wellness accounts to ensure accuracy in reporting science and research communications, as well as providing strategic reputation management counsel. He is a Registered Dietitian and received his Masters from Texas Tech University. Dylan has presented research at conferences including The Obesity Society's Obesity Week, the American Society for Nutrition's annual nutrition meeting, Experimental Biology, the Association for Healthcare Social Media's annual meeting and the Food and Nutrition Conference and Expo. Dylan has also published several scientific manuscripts in peer-reviewed journals. His research interests include appetite hormones, obesity, weight bias, feeding behaviors, diversity in the dietetic profession and the impostor phenomenon among nutrition and dietetics professionals. He has been featured in publications including Food and Nutrition Magazine and Practice Applications of the Journal of the Academy of Nutrition and Dietetics. Dylan also spends time mentoring students about the growing field of nutrition communications and precepting dietetic interns from internships around the country. Dylan serves as Past-Chair for the Cultures of Gender and Age Member Interest Group of the Academy of Nutrition and Dietetics and is also the Social Media Chair for the Early Career Nutrition Interest Group of the American Society for Nutrition.





## Nalin Siriwardhana, Ph.D., FACN

### Senior R&D Innovation and Medical Affairs, Bayer

Nalin Siriwardhana, PhD, FACN is a senior R&D innovation and medical affairs professional with proven track records in both academia and industry. He has expertise in applications of nutraceuticals and active pharmaceutical ingredients for a wide array of health conditions including heart, digestive, bone, joint, immune, diabetes, cancer, cognition, eye and sleep complications. Followed by the academic career as a Research Assistant Professor at the University of Tennessee and Texas Tech University, he has joined Reckitt as a Senior Associate-Global Medical & Innovation. Thereafter, he joined Church and Dwight as a R&D Innovation and Scientific Affairs Program Manager where he launched several successful nutritional supplements. In his current role at Bayer as a Senior Associate Director for Allergy, Cough Cold and Immunity, he contributes his medical, R&D innovation and nutrition science expertise for product innovations globally. He has published more than 20 scientific articles. He has been a frequent invited speaker for R&D innovation, nutritional supplements, and microbiome applications conferences.

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## GNO Officers



### Temitope Ibiyemi, President



### Shadi Nejat, DC, Vice President (President Elect)



### Harsh Shah, Student Organization Representative Chair

# Student Poster Presentation Abstracts

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## Jacob Nicasio

### Breakout Room #1

Serum Water T2 and Its Association with Cardiometabolic Health: The PREMIER Study

Jacob L. Nicasio, Diana F. Sandoval, Erin B. Campbell, Joshua Garza, Juan Aldana,

Alok K. Dwivedi, and David P. Cistola

Graduate School of Biomedical Sciences and Center of Emphasis in Diabetes & Metabolism, Department of Molecular and Translational Medicine, Paul L. Foster School of Medicine, Texas Tech University Health Sciences Center of El Paso.

Previously, we reported that plasma and serum water T2 are global markers of cardiometabolic health in asymptomatic disease-free individuals. Water T2 detects the hidden components of metabolic syndrome in one measurement. To validate this discovery, we analyzed 4,578 bio-banked plasma and serum samples from the PREMIER study, a randomized controlled trial of lifestyle interventions for lowering blood pressure. Hypothesis: Among PREMIER participants at baseline, serum water T2 is associated with multiple measures of cardiometabolic health. Materials and Methods: This ancillary study of PREMIER has an observational, cross-sectional design. A total of 810 generally healthy, non-diabetic subjects were enrolled in the parent study, with a subset (n=417) analyzed here. Using benchtop magnetic resonance relaxometry, T2 decay curves were recorded at 37°C for unmodified human serum. The association of serum water T2 with potential predictor variables was explored using multivariable regression modeling in JMP Pro v16.2. Results: Serum water T2 values were independently associated with markers of dyslipidemia, inflammation, insulin resistance, kidney function, family history of CVD, household income, and the interaction between BMI and race. Compared with non-obese/non-Black individuals (reference group), obese/Black individuals showed negative beta coefficients ( $p < 0.0001$ ) reflecting relatively poor cardiometabolic health. By contrast, the beta coefficients for the non-obese/Black ( $p = 0.636$ ) and obese/non-Black ( $p = 0.616$ ) groups were not statistically different from the reference group. Conclusion: Serum water T2 is a promising screening test for detecting hidden abnormalities in apparently healthy individuals.

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## Nikhil Gogineni & Kanishk Goel

### Breakout Room #2

Surveying Student Attitudes and Behaviors Regarding Diet and Exercise

Nikhil Gogineni & Kanishk Goel

TTUHSC Lubbock Medical Students

With a growing number of restaurants surrounding universities across the nation, our goal was to understand how often undergraduate students at Texas Tech exercised and ate commercially prepared meals in comparison to the average American. We aimed to use demographic factors to understand how their nutritional knowledge and access to resources affects their ability to prepare home-cooked meals. Undergraduate students from Texas Tech's Honors College were surveyed using the TTUHSC School of Medicine P3-1 TTU Honors College/WNR Survey, and 45 responses were recorded. The project was approved by the TTUHSC IRB. Results showed that students living in on-campus dorms ate commercially prepared meals more often per week than those living in apartments or houses. However, regardless of their living situation, all students expressed a significant interest in becoming more proficient in cooking. Additionally, students surveyed held a belief that the average American ate commercially prepared meals more often and exercised less often than the average American truly does. These results may indicate that most students surveyed did not feel they had enough nutritional knowledge or access to resources to prepare their own meals, pointing to a greater need for universities to emphasize nutrition throughout the undergraduate years. We believe that the current trends of eating and lifestyle choices in young adults could serve as a continuing trigger for chronic disease onset, especially obesity and heart disease. Our future plans are to implement nutritional workshops for the undergraduate population to improve their awareness of dietary guidelines and develop essential culinary skills.

## Joao Pedro Torres Guimaraes

### Breakout Room #3

Regulation of Energy Metabolism by Dietary pH and Protein Source in Diet-Induced Obese Male and Female Mice

Guimaraes, J.P.T; Menikdiwela, K.R; Scoggin, S; Gollahon, L, Moustaid-Moussa, N

Department of Nutritional Sciences and Obesity Research Institute, Texas Tech University

Consumption of foods with acidic pH has been proposed as a potential contributor to negative metabolic health outcomes. We hypothesized that metabolic health will be improved by consuming a diet containing pH-enhanced ground beef or casein diets, compared to a non-pH-enhanced diets. Low-fat diet + casein protein (LFC), LF + casein with pH enhanced/ammonia (LFCN), LF + beef protein (LFB), LFB with pH enhanced (LFBN), High-fat diet + casein protein (HFC), HF + casein with pH enhanced (HFCN), HF + beef protein (HFB) and HFB with pH enhanced (HFBN) groups were used. Mice were fed these diets for 12 weeks and weighed weekly. Mice were individually housed in metabolic cages (TSE System) at week 11 to assess respiratory exchange ratio (RER), VCO<sub>2</sub> and VO<sub>2</sub>, and tissues collected at termination. In males, body and fat pad weights increased in all HF groups, regardless of the protein source when compared to LF groups. In females, only HFC group had higher fat pad weights compared to LFC. During the day, only HF females had decreased VCO<sub>2</sub>, and at night both males and females exhibited the same pattern. The reduced RER, from both HF males and females indicated that fat was used as the main energy source. Our data suggest that metabolic changes and substrate utilization are primarily affected by dietary fat content, especially in female mice. Further analyses in metabolically active tissues will help to clarify the mechanisms mediating sex-dependent differences in metabolic effects of dietary pH enhancement, fat content and protein source.

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## Dominic Ancona & Leticia Cortes

### Breakout Room #4

Surveying Student Attitudes and Behaviors Regarding Diet and Exercise

Dominic Ancona<sup>1†\*</sup>, Leticia Cortes<sup>1†\*</sup>, Amy Hu<sup>1†</sup>, Chathurika S. Dhanasekara<sup>2</sup>, Afrina H. Rimu<sup>3</sup>, Christina Robohm-Leavitt<sup>1</sup>, Ann Mastergeorge<sup>4</sup>, Chanaka Kahathuduwa<sup>1,5</sup>

<sup>1</sup>Department of Laboratory Sciences and Primary Care, TTUHSC, TX <sup>2</sup>Department of Surgery, TTUHSC, <sup>3</sup>Department of Internal Medicine, TTUHSC, <sup>4</sup>Department of Human Development and Family Sciences, TTU, <sup>5</sup>Department of Psychiatry, School of Medicine, TTUHSC

Evidence suggests that autism spectrum disorders (ASD) increase the risk of obesity, which increases the risk of multiple cardio-metabolic diseases. While several studies have explored the association between ASD and some of the cardio-metabolic risk factors, the evidence remains ambiguous. Objectives: To conduct a systematic review and meta-analysis of observational and experimental studies to examine the risk of development of cardio-metabolic diseases among individuals with ASD. Methods: PubMed, Scopus, and Web of Science databases were searched using specific keyword combinations to identify studies. Duplicate records were removed using an in-house software pipeline. Titles and abstracts of each record were screened by at least two screeners based on pre-defined eligibility criteria. The full-text articles meeting inclusion criteria in the first round of screening will be fully examined using the same eligibility criteria. Numerators and denominators of test (i.e., ASD) and neurotypical control groups that could be used to compute relative risk of each cardio-metabolic condition in ASD will be extracted into a spreadsheet with pre-defined data fields. DerSimonian-Liard random effects meta-analyses will be performed using the meta package in R (PROSPERO registry-CRD42021268892). Results: On the initial database search, 4,816 records were identified. After removal of duplicates, 1,064 unique records remained. Titles and abstracts of the records were screened. Forty-eight full-text articles are currently being screened for eligibility and data extraction for meta-analysis. Conclusions: We expect that this systematic review and meta-analysis will synthesize the available data to confirm or dispute the potential association between ASD and considered cardio-metabolic risk factors.

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## Chineme Chima-Nlewem

### Breakout Room #5

Effects of Dietary Interventions on Polycystic Ovarian Syndrome: A Systematic Review and Meta-Analysis of Interventional Trials

Chineme Chima-Nlewem<sup>1†\*</sup>, Madison Hayes<sup>2†</sup>, Erin Roye<sup>1†</sup>, Chathurika S. Dhanasekara<sup>3</sup>, Christina Robohm-Leavitt<sup>1</sup>, Chwan-Li Shen<sup>4,5,6‡</sup>, Chanaka Kahathuduwa

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Polycystic ovary syndrome (PCOS) is an endocrine disorder that influences the metabolism in reproductive-aged women. Dietary modification is recommended as the first-line therapy; however, a favorable dietary regimen remains unclear besides energy restriction. Objective: To conduct a systematic review and meta-analysis of randomized controlled trials (RCTs) to summarize evidence on the impacts of diets with low-carbohydrate (LC) or low glycemic index (LGI) on metabolic parameters. Methods: PubMed, Scopus, ProQuest, and Web-of-Science databases were searched using specific keyword combinations to identify studies. Duplicate records were removed using an in-house software pipeline. Titles and abstracts of each record were screened by at least two screeners based on pre-defined eligibility criteria. The full-text articles meeting inclusion criteria in the first round of screening were fully examined using the same eligibility criteria. Data from eligible RCTs will be extracted. DerSimonian-Liard random-effects meta-analyses will be performed using the meta package in R (PROSPERO registry-CRD42021258399). Results: On the initial database search, 887 records were identified. After removal of duplicates, 572 unique records remained. Titles and abstracts of the records were screened. One hundred and forty full-text articles were currently screened by two independent screeners for eligibility, leaving 16 studies for quantitative analysis. Nine RCSs were on LGI, and seven were on LC. Data extraction and meta-analyses for predefined metabolic parameters are currently being conducted. Conclusions: We expect that this systematic review and meta-analysis will synthesize the available data to quantify the potential effect of these specific dietary modifications on metabolic parameters in patients with PCOS.

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## Rama Supraja Balaga

### Breakout Room #6

Effects of Tart Cherry on Lifespan of a *Caenorhabditis elegans*, Amyloid-beta Strains for Alzheimer's Disease

Rama Supraja Balaga, Hannah Petry, Caitlyn Tayag, Tasnim Galalla, Mahsa Yavari, Shasika Jayarathne, Mizanur Rahman, Siva Vanapali, Yujiao Zu, Naima Moustaid-Moussa

Departments of Nutritional Sciences, College of Human Sciences and Obesity Research Institute, Texas Tech University, Lubbock, TX, US

Alzheimer's disease (AD) is a neurodegenerative age-related disorder, characterized by amyloid plaques (A $\beta$ ) and Tau tangles in the brain. Nematode organism *Caenorhabditis elegans* (*C. elegans*) has emerged as a premier model system for aging and AD research, due to their simple body plan and short lifespan of 3 weeks. We previously reported the beneficial effect on longevity of tart cherry extract (TCE), rich in anthocyanins, in wildtype *C. elegans*. The objective of this study is to investigate the effect by which TCE extends lifespan in transgenic *C. elegans* expressing human A $\beta$ . Methods: Age synchronized *C. elegans* GRU102, and GMC101, which express human A $\beta$  were loaded into the microfluidic chips and used the NemaLife infinity machine to perform lifespan experiments for 18-26 days at room temperature. Worms received 20 mg/ml of *E. coli* OP50 and one of the following treatments: control (no supplementation), 6 or 12  $\mu$ g anthocyanin/ml, of TCE. Results: We found that TCE supplementation at 6  $\mu$ g/mL, increased ( $p < 0.05$ ) the medium lifespan of GRU102 strain (23 days), when compared to control worms (16-17 days). For GMC101 strain, TCE at 6, and 12  $\mu$ g/mL, increased the medium lifespan of worms by 15 and 15.5 days, respectively, compared to control worms (13 days). Conclusion: Anthocyanin-rich TCE exhibit beneficial effects in *C. elegans* AD models, by increasing their lifespan. Thus tart cherry may provide an efficient approach for combating AD and other aging-related diseases in human. Future studies are warranted to determine mechanisms by which TCE extends lifespan and benefits AD.



## Kimberly Brown

### Breakout Room #7

Depression and Obesity: Changes in Depression Levels throughout the Medical Journey

Kimberly Brown<sup>1</sup>, Jiyeon Kim<sup>1</sup>, Radha Patel<sup>1</sup>, Hannah Jackson

MS1- Texas Tech University Health Sciences Center School of Medicine, Lubbock, Texas

Sleep, mental health, and obesity are interdependent. A common mental health problem that many individuals face is depression. A systematic review published by JAMA showed that adults with depression are 58% more likely to develop obesity. Furthermore, a recent study found a strong bidirectional association between obesity and depression in young and middle-aged students. However, little to no research has been conducted to examine this relationship in medical students. Considering that medical students and residents are often in high-stress environments that can negatively impact mental health, the focus of our study was to analyze depression, sleep, and self-harm thoughts among male and female medical students throughout their medical school journey. This project used the TTUHSC School of Medicine P3-1 Honors Project Omnibus Survey to survey first through fourth year medical students and residents. Survey questions included Likert-type questions involving mental health and personal priorities. We received a total of 265 responses for our questions. We found that students who received around 4-6 hours daily were more likely to have thoughts of self-harm and depression than those who slept 7-9 hours. We also observed that men experienced higher and more stable rates of depression during all four years of medical school, while these rates in women greatly increased in residency. With mental health problems being a risk factor for obesity, future research on the link between depression and obesity in medical students and residents will be conducted.

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## Mallorie Coltharp

### Breakout Room #8

Prevalence of PCOS and Related Morbidities in Obese Hispanic Adolescents

Mallorie Coltharp, Ted Shi, Pallavi Dubey, Vishwajeet Singh, Alok Dwivedi, Sireesha Reddy

Paul L Foster School of Medicine MS1

PCOS is associated with hyperandrogenism, anovulation, and is a risk factor for metabolic abnormalities. Till now, no studies are available for obesity in Hispanic adolescents having PCOS or having symptoms of PCOS. We assessed the incidence of obesity in Hispanic adolescents having one or more markers of PCOS. Methods: We did a chart review of 820 charts of adolescents aged 11-18 years who visited the Texas Tech specialty clinics from 2016 to 2021. We reviewed the demographic, diagnostic, and clinical information of the subjects. Primary diagnoses of PCOS, Hirsutism, acne, and irregular menstruation (IM) were recorded along with race/ethnicity, age, BMI, presence of acne, and weight. Results: The mean age of the adolescents was 16 years. 49.6% of subjects were overweight or obese. The overall prevalence of PCOS in included subjects was 25%. Higher BMI was associated with Hirsutism and irregular menstruation but not acne. These analyses were adjusted for age, PCOS, HR. Adolescents having BMI higher than 30 had a higher risk of being diagnosed with PCOS (OR 5.21(3.67, 7.41),  $p < 0.0001$ , had higher rates of irregular menstruation (3.26 (2.38, 4.46)  $p < 0.0001$ ) but were inversely associated with acne (0.46 (0.33, 0.63),  $p < 0.0001$ ). Subjects having BMI  $\geq 30$  had higher odds of having more markers of PCOS including hirsutism, irregular menstruation, and acne (2.75 (1.25, 6.04)  $p = 0.012$ ). Conclusion: Obesity is a risk factor in Hispanic adolescents for diagnosis of PCOS and related morbidities. Adolescents with BMI  $\geq 30$  should be screened for PCOS.

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## Sara Phy

### Breakout Room #9

Impact of Polyphenol and Carotenoid Intakes on Mental Health and Diet Quality in a Food Insecure Undergraduate Student Sample

Sara Phy<sup>1,4</sup> & Oak-Hee Park, Ph.D

Department of Nutritional Sciences, Texas Tech University; <sup>2</sup> College of Human Sciences, Texas Tech University; <sup>3</sup> Obesity Research Institute, Texas Tech University; <sup>4</sup> Honors College, Texas Tech University

The experience of food insecurity in undergraduate students is linked to poor mental health and low diet quality, including reduced fruit and vegetable intakes. Research suggests that increased intakes of polyphenols and carotenoids, phytochemicals in fruits and vegetables, are associated with increased positive affect and reduced depressive symptoms, but studies of these effects in college students are limited. This study aims to examine the impact of polyphenol and carotenoid intakes on mental health and diet quality among a food insecure undergraduate student sample. Over 100 food insecure students will be recruited and randomly assigned into either control or intervention groups. Pre-post nutrition intervention (10 weeks) will emphasize increasing fruit and vegetable intakes to reduce psychological distress and improve diet quality. Control group will receive general nutrition education while intervention group will receive equal education with hands-on fruit and vegetable preparation classes at the university. Diet quality, skin carotenoid levels, polyphenol intake, psychological distress, nutrition knowledge, and Body Mass Index (BMI) will be assessed using the ASA24® Dietary Assessment Tool, Veggie Meter®, Phenol-Explorer, Kessler-6, 20-item validated nutrition knowledge questionnaire, and height (ft.) and weight (lb.) to obtain BMI, respectively. Descriptive statistics and ANCOVA will be used for data analysis ( $p < .05$ ). We expect polyphenol and carotenoid intakes to have an inverse relationship with psychological distress and a direct relationship with diet quality among food insecure participants. Further research is needed to understand the role of nutrition in the prevention and treatment of mental health issues in the pivotal stage of young adulthood.

## Mahsa Yavari

### Breakout Room #10

Sex Differences in the Anti-inflammatory and Anti-Amyloidogenic Effects of Eicosapentaenoic Acid in obese APPswePS1dE9 Alzheimer's Mouse Model

Mahsa Yavari<sup>1 2</sup>, Latha Ramalingam<sup>1 2</sup>, Breanna Harris<sup>2 3</sup>,

Chanaka Nadeeshan Kahathuduwa<sup>2</sup>, Yujiao Zu<sup>1 2</sup>, Naima Moustaid-Moussa<sup>1 2\*</sup>

Departments of Nutritional Sciences, <sup>2</sup> Obesity Research Institute, <sup>3</sup> Biological Sciences, Texas Tech University; & School of Health Professions, Texas Tech Health Sciences Center.

Alzheimer's disease (AD) is a neurodegenerative disorder characterized by amyloid-beta (A $\beta$ ) plaques, which may be exacerbated by obesity. As eicosapentaenoic acid (EPA) exerts anti-obesity and anti-inflammatory effects in obesity; our objective was to investigate whether EPA also has anti-inflammatory and anti-amyloidogenic effects in an AD obese mouse model. Male and female APPswePS1E9 transgenic (TG) and non-TG wild type littermates (WT) were fed with low fat (LF), high fat (HF), or HF supplemented with 36g/kg EPA (EPA) for 8 months. Cortex was used for gene expression analyses and serum for A $\beta$  and cytokine analyses. HF weighed more than LF groups ( $p < 0.001$ ) and males weighed more than females. Compared to WT, TG mice had higher serum A $\beta$ -40 levels ( $p = 0.004$ ) and higher amyloid precursor protein (APP) mRNA levels in cortex ( $p = 0.0204$ ). Compared to HF, EPA decreased serum A $\beta$ -40 in WT males ( $p = 0.0182$ ) and APP mRNA levels in the cortex of male and female TG mice ( $p = 0.0168$  and  $0.0030$ ). TG expressed higher MCP1 and IL1 ( $p = 0.0158$  and  $0.0142$ , respectively) compared to WT. Females expressed significantly higher cortex MCP1 and IL1 than males. Moreover, EPA exhibited anti-inflammatory effects in both TG sexes for MCP1 ( $p = 0.0226$  and  $0.0108$ ) and in TG females only, for IL1 ( $p = 0.0344$ ). In summary, EPA protects against A $\beta$  deposition and inflammation in AD obese mice, via systemic and central anti-inflammatory mechanisms. These findings merit further investigation of fish oil effectiveness in humans with AD and obesity.

## Fitia Razafimanjato

### Breakout Room #11

Effects of Eicosapentanoic Acid Supplementation in a Diet-Induced Obese Transgenic Mouse Model of Alzheimer's Disease

Fitia Razafimanjato<sup>1,3</sup>, Mahsa Yavari<sup>1,3</sup>, Angela Chavira<sup>1</sup>, McKenna Davis<sup>1</sup>, Latha Ramalingam<sup>1,3</sup>, Breanna Harris<sup>2,3</sup>, Yujiao Zu<sup>1,3</sup>, Naima Moustaid-Moussa<sup>1,3</sup> Department of Nutritional Sciences<sup>1</sup>, Department of Biological Sciences<sup>2</sup>, Obesity Research Institute<sup>3</sup>, Texas Tech University

Alzheimer's disease (AD) is a progressive neurodegenerative disease characterized by cerebral aggregation of amyloid beta (A $\beta$ ). Obesity is a chronic disease associated with excessive white adipose tissue (WAT) accumulation, low-grade inflammation, and may contribute to AD. We previously reported the anti-amyloidogenic effect of eicosapentaenoic acid (EPA) in AD mouse model. The objective of this study is to determine whether EPA decreases high-fat (HF) diet-induced metabolic changes and inflammation in WAT of AD mice. Male and female APPswePS1dE9 transgenic (TG) and wild-type (WT) littermates were fed a low-fat (LF), HF, or HF diet supplemented with 36g/kg EPA for 8 months. Body weight was measured weekly and blood and WAT were collected after intervention. Three-way ANOVA analyses were conducted using GraphPad Prism. In both genotypes, females in HF and EPA groups have lower body weight and fat mass than males ( $P < 0.05$ ). Consistently, females have lower visceral WAT weight than males in HF and EPA groups in both genotypes ( $P < 0.05$ ). In WT males, compared to HF, EPA decreased mRNA levels of tumor necrosis factor  $\alpha$  ( $P=0.08$ ). As expected, we found that fatty acid composition in red blood cells of both sexes have lower arachidonic acid and higher EPA levels in EPA fed group than HF and LF groups ( $P < 0.001$ ). In conclusion, our findings showed that EPA possibly counteracted HF-induced inflammation. Further analyses are ongoing to determine mechanisms underlying potential benefits of EPA in obesity-associated AD.

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## Kristin Huseman

### Breakout Room #12

COVID-19's Impact on TTUHSC Graduate & Medical Students' Exercise Routines

Kristin Huseman, Adilene Chapina-Guizar, & Mimi Zumwalt, MD  
TTUHSC School of Medicine

COVID-19 has had an impact on everyone's life and daily routines, but how has it impacted medical students and their exercise routines? TTUHSC graduate and medical students were surveyed on their exercise routines before and after the beginning of the COVID-19 pandemic. Questions were designed to evaluate changes in types of exercise, changes in intensity, duration, and frequency before and after, as well as weight changes. The results demonstrated that students engaged less in exercises that involved lifting weights, cardio machines, group fitness classes, and group sports after the beginning of COVID-19. However, there was an increase in exercises consisting of home-based workouts and running outdoors. Intensity, duration, and frequency decreased among medical students. Additionally, 34% reported that they gained weight, 13% lost weight, and 53% stated that their weight stayed the same. Despite the increase in at home workouts, 34% of students still indicated that they had gained weight. This change could potentially be accounted for by the decrease in intensity, duration, and frequency of workouts noted by respondents. We also suspect that these decreases are related to a lack of social accountability as students moved from group settings to exercising at home. Research suggests that medical students who engage in aerobic and strength training exhibit better mental health and lower rates of burnout. As part of our project continuation in the 22-23 school year, we are going to focus on providing education for students on how to create effective home-based workouts.

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## Abigail Kortenhoeven

### Breakout Room #13

Global Stress and Engagement with Health Behaviors in the Context of the COVID-19 Pandemic  
Abbs Kortenhoeven; Caroline Cummings, PhD, Amy Hughes Lansing, PhD, University of Vermont.  
Texas Tech University

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Prior research supports the links between global stress and increased engagement in negative health behaviors and reduced engagement in positive health behaviors. In the context of the COVID-19 pandemic, adolescents have been noted to experience even further emotional stress, as well as increased engagement in negative health behaviors and a decline in positive health behaviors. There is limited investigation into the impact of stress at the start of COVID-19 and how it relates to adolescent-reported engagement in both positive and negative obesity-related health behaviors. This study examined the associations between daily stress levels and daily obesity-related behaviors, including physical activity level and dysregulated eating behaviors, in adolescents. Methods Adolescents aged 11 to 17 (N = 47) completed a 7-day diary, with items assessing daily stress, physical activity, and dysregulated eating behaviors (loss of control eating and consuming excessive quantities). Multilevel modeling was used to analyze data. Results On days in which adolescents reported greater than average stress, they also reported engaging in less physical activity. Greater average stress was associated with lower average physical activity. There were no significant associations between either daily or average stress levels and dysregulated eating. Significance Stress during unprecedented times confers risk for decreased engagement in positive health behaviors. The relationship between stress and negative health behaviors is more complex. Conclusions Adolescents need more support from caregivers and clinicians during times of stress in order to engage in positive health behaviors. Future studies should further explore these associations and how these trends may change over the course of the pandemic.

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## Maryam Seifishahpar

### Breakout Room #14

Effects of Tart Cherry and Fish Oil on Diet-induced and Genetic Obesity  
Maryam Seifishahpar, Kalhara Menikdiwela, Jung Han Kim, Naima Moustaid-Moussa  
Department of Nutritional Sciences, College of Human Sciences and Obesity Research Institute, Texas Tech University & Department of Biomedical Sciences, Joan C. Edwards School of Medicine, Marshall University

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Obesity is a major public health concern that increases the risk of many other chronic diseases and is associated with low grade inflammation and adipose tissue dysfunctions. Excess fat storage disrupts adipose functions including inflammation, autophagy and endoplasmic reticulum (ER) functions (causing ER stress). Fish oil's omega-3 polyunsaturated fatty acids (FO) and tart cherry anthocyanins (TC), individually possess anti-inflammatory properties. We hypothesized that when combined, TC and FO will exert greater synergistic or additive effects on inflammation and other adipose tissue functions than individual compounds. Male and female genetically obese TALLYHO/Jng (TH) and wild type B6 mice were fed five different diets including low fat (LF), high fat (HF), and HF supplemented with TC, FO, or TC+FO for 10 weeks. Both B6 and TH mice gained significantly more weight on HF diets compared to LF with greater changes in TH mice. Supplementation with TC and TC+FO significantly decreased mRNA levels of inflammatory MCP1 in B6 male mice, compared to non-supplemented HF group. Furthermore, TC+FO supplementation significantly reduced the expression of ER stress markers CHOP and sXBP1, compared to the HF group in TH male mice. The mRNA level of ATG12 was significantly reduced by TC, FO, and TC+FO, compared with HF group in TH male mice. Collectively, FO and TC effects are partly mediated by reduced ER stress, autophagy, and inflammatory pathways in adipose tissue. These data indicate potential metabolic benefits of TC and FO; however, further validation of these changes at protein levels for these pathways is warranted.



## Fatemah Jafari

### Breakout Room #15

Associations between FTO rs9939609 polymorphism, serum vitamin D, mental health, and eating behaviors in overweight adults

Fatemeh Jafari a,b, Mahsa Mehrdad a, Mohammad Hassan Eftekhari a, Hossein-Ali Nikbakht c, Maryam Gholamalizadeh

a Department of Clinical Nutrition, School of Nutrition & Food Sciences, Shiraz University of Medical Sciences, Shiraz, Iran; b Department of Clinical Nutrition, School of Nutrition & Food Sciences, Isfahan University of Medical Sciences, Isfahan, Iran; c Social Determinants of Health Research Center, Health Research Institute, Babol University of Medical Sciences, Babol, Iran; d Student Research Committee, Cancer Research Center, Shahid Beheshti University of Medical Sciences, Tehran, Iran

Despite the significant role of Fat Mass and Obesity-Associated (FTO) gene in obesity, the underlying mechanisms are not fully elucidated. vitamin D deficiency and obesity are mostly seen together; it can be hypothesized that this nutrient may have an impact in the role of FTO genotype in adiposity. Thus, we aimed to investigate the association of FTO rs9939609 gene polymorphism with eating behaviors, eating disorders, and general mental health in overweight adults, considering their vitamin D intake as a mediate confounding factor. This crosssectional study was carried out on 197 overweight adults in Shiraz, Iran. Genotyping was performed through amplification refractory mutation system polymerase chain reaction (ARMS PCR). Mental health, vitamin D intake, eating behaviors and disorders were assessed by the validated questionnaires. The risk allele of the FTO rs9939609 polymorphism (A) was significantly associated with a higher risk of eating behavior and mental health disorders ( $P < 0.05$ ). After considering vitamin D intake, the AA genotype carriers had significantly higher risks for poorer eating behavior ( $P = 0.002$ ), mental health ( $P = 0.007$ ), and general mental health ( $P = 0.039$ ) compared with the TT carriers if they had insufficient vitamin D intake. In conclusion, these results indicated that the A allele of the FTO rs9939609 polymorphism may be associated with poorer eating behaviors, mental health, and higher risk of eating disorders. It was also identified that the effect of FTO rs9939609 A risk allele on eating behavior and mental health may be limited to people with insufficient vitamin D intake.

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## Mohammad Yosofvand

### Breakout Room #16

TIL Cells Detection in Breast Cancer Microscopic Image

Mohammad Yosofvand, Dr. Hanna Moussa

Mechanical Engineering Department, TTU

Breast cancer is a major issue threatening women's health. Probably 1 out of 8 women in the US will develop breast cancer during their lifetime. Detecting breast cancer cells in the early stages of the disease can be a significant step in medical treatments. Recently, oncologists and cancer researchers have recommended Tumor-infiltrating lymphocytes (TILs) as a biomarker to evaluate the breast cancer stage and development in the patient's body. TILs are also used to evaluate the patient body response to cancer treatments such as chemotherapy. Oncologists count the number of TILs on H&E cancer slides and calculate the TILs percentage to evaluate the breast cancer stage. This process is very time-consuming and it is not very accurate as it varies from one researcher to another based on their experience. Therefore, to address this problem, we developed a computer program that can process the breast cancer slides and detect the TIL and cancer cells automatically. Therefore, we can calculate the TILs percentage very accurately as well we can measure the area of the cells by using image processing methods and divide it to the whole area of breast cancer residual and obtain the TILs percentage. This method will improve the accuracy of assessing TILs immensely. Also by using the developed method to detect cancer and TIL cells we can analyze a large number of slides in a short period of time. Thus, assessing the TILs using AI methods can help improve women's health significantly.

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## Douglas Bettarelli

### Breakout Room #17

Addressing Gaps in Preventative Care for People in Lubbock Through a Teaching Food Pantry  
Douglas Bettarelli, BS; Sana Erabti, BS; Blake Harp, BS; Irina Kim Cavdar, BS; Khaja Siddiqui, MS, MPH, Jessica Sikora, BS, M.Ed, Ebtesam Attaya Islam, MD, Ph.D  
TTUHSC School of Medicine, MS1

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Unhealthy dietary patterns aggravate chronic health conditions in different communities throughout the country. People from various backgrounds, including medical students, can experience food misconceptions and insecurity. Physicians are a driving force in nutrition and health education for their patients, highlighting the need for future physicians to become nutrition experts. A teaching food pantry aims to train medical students and provide nutrition education to our community. Our goals were to evaluate student demographic responses and determine a teaching food pantry's value for future healthcare providers. Methods: We obtained demographic information on personal eating habits, limitations, and food insecurity in an omnibus survey emailed to medical students. We asked about confidence and willingness to volunteer at a teaching food pantry and their perceived importance of physicians addressing diet and lifestyle in their community. We determined volunteer willingness with two questions before and after mentioning training materials. We recorded responses on a scale from 1-5. Results: Students who reported poor eating habits demonstrated low confidence and willingness to volunteer in an education food pantry. The addition of training materials increased the average willingness in the poor eating habit group from 2.40 to 4.00. Other groups had similar, less drastic results. Conclusions: Although student doctors agree they should play an integral role in the dietary health of their patients, they have varying levels of confidence and willingness that align with personal eating habits. A teaching food pantry can improve medical students' eating habits and training while improving their confidence as nutrition educators.

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## Shadi Nejat

### Breakout Room #18

DNAJB3 Deficiency Exacerbates Metabolic Dysfunctions in Diet-induced Obese Female Mice  
Shadi Nejat, Kalhara Menikdiwela, Shane Scoggin, Mohammed Hehbi, Paul Thornalley, & Naima Moustaid-Moussa  
Department of Nutritional Sciences

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Obesity and its related metabolic dysfunctions are partly mediated by chronic low-grade inflammation and altered expression of numerous proteins including stress responsive heat shock proteins (HSPs). We are specifically interested in HSP40 (Heat Shock Protein-40), subfamily B, member 3 (DNAJB3), a chaperone protein that aids in restoring protein homeostasis. Patients with obesity and type 2 diabetes (T2D) expressed low levels of DNAJB3, which was partly restored by physical activity. Accordingly, we hypothesized that lack of DNAJB3 will increase body weight, inflammation, glucose intolerance and insulin resistance in diet-induced obese mice, compared to B6 wild type (WT) littermates. DNAJB3 knockout (KO) mice were generated using the CRISPR/Cas 9 approach. Male and female KO and WT mice were fed high fat (HF: 45 kcal% fat) or low fat (LF: 10 kcal% fat) diets for 12 weeks. Body weight and food intake were measured weekly; and body composition and glucose tolerance tests were conducted during the intervention. Following euthanasia, blood, and tissues were harvested. Compared to WT males and females, KO mice fed HF diets demonstrated higher body weight and fat mass and lower glucose clearance rate. Interestingly, these genotype differences were more pronounced in the HF KO females which had a significantly higher body weight and fat mass compared to the other groups. Thus, lack of DNAJB3 increased adiposity and glucose intolerance, especially in obese female mice, warranting further research on sex differences in DNAJB3 metabolic functions and its potential use as a therapeutic target for obesity and T2D.

## Nicholas Householder

### Breakout Room #19

A comparison of perceptions and behavior regarding sexual dysfunction and medical-help seeking amongst health-educated males and females at TTUHSC

Nicholas A. Householder, Akshay Raghuram, Cameron Tuazon, Kofi Agyare, Skylar Thipaphay.  
TTUHSC School of Medicine

The objective was to analyze gender differences in perceptions of sexual dysfunction and medical-help seeking behavior among medically-educated individuals (TTUHSC graduate students and faculty).

Methods: Data was collected via an Omnibus survey administered online amongst Texas Tech Health Sciences Center staff, faculty, and third and fourth year medical students in Lubbock, Permian Basin, Midland, and Odessa. Results: More women among our cohort report experiencing sexual dysfunction. We also found that women surveyed were most likely to ignore/wait and see in the first 1-2 weeks of experiencing sexual dysfunction, as well as at the 1 month and 2 month mark. Comparatively, men were more likely to make doctor's appointment after 1-2 weeks, 1 month, and 2+ months of experiencing sexual dysfunction. Significance: Women surveyed in this cohort report experiencing much higher rates of sexual dysfunction, which may prove contrary to popular opinion. In addition, the majority of those women surveyed stated that they would not seek medical attention from a physician for sexual dysfunction within the first two months. Conclusion: Despite sexual dysfunction being more present amongst health-educated women at TTUHSC, our results found that they were less likely to seek direct medical aid at the 2 week mark, 1 month mark, and 2 month mark. This may be a result of underlying societal norms, taboos, and expectations for men to be more sexual beings than women. There could also be underlying hormonal mechanisms at play, potentially influenced by widespread use of hormone-modulating birth control medication amongst women.

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## Daniel Wood

### Breakout Room #20

Effects of Test Weeks on Medical Student Wellness

D. Wood, H. Abila, A. Broadhead, B. Gunter, R. Reich, N. Steele, E. Conser M.D  
Texas Tech University Health Science Center

We sought to research the effects of test weeks on medical student self-care routines. Medical school is a high-pressure experience, and since most tests at the Texas Tech University Health Science Center School of Medicine every two weeks, that pressure comes to a clear peak regularly. We utilized the TTUHSC School of Medicine Omnibus Survey, an online survey instrument sent to students and faculty at the Health Science Center. The questions that our group submitted received 165 responses from first- and second-year medical students. This survey was approved for exempt review by the TTUHSC Institutional Review Board. 73% of respondents agreed or strongly agreed that test weeks increased their stress levels, while 62% agreed or strongly agreed that test weeks increased their stress levels. In regard to healthy behavior, 42% stated that their quality of diet was worse or much worse during exam weeks, 44% reported their quality of sleep was worse or much worse, and 53% responded that their amount of exercise was worse or much worse. Results appear largely as anticipated, with strong percentages of respondents indicating some level of adverse impact on various aspects of wellness during test weeks. A strong majority indicated an increase in stress and anxiety. One limitation is the reliability of self-reported, retrospective data. An interesting next step would be to determine what qualities sets apart the minority that reports not being as heavily impacted by test week. We plan to present these results and wellness strategies to incoming first-year medical students.

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## Anudeeksha Satheeshkumar

### Breakout Room #21

Underdiagnoses of Obesity/Overweight in Academic Outpatient Setting

Barath Rangaswamy, MD, Priya Darshini Velumani MD, Goutami Mangu MD, Hina Tariq MD, Anudeeksha Satheeshkumar, BS, Kushal Gandhi, PhD, John Garza, PhD

TTUHSC , Internal Medicine, Permian Basin

B

Body mass index is a reliable predictor of obesity and overweight, but is under acknowledged by physicians. Our Objective is to determine the extent to which the diagnosis of obesity and overweight is made in our clinic. Materials and Methods: A cross sectional analysis of involving 299 patients with BMI > 25 who visited TTUHSC Permian Basin Internal Medicine Clinic from October 1st 2020 to October 31st 2021 We collected body mass index, diagnosis of obesity and the diagnosis of overweight in the problem list of the office visit note documented by physicians. We evaluated if patients with BMI > 30 had a documented diagnosis of obesity and if patients with BMI from 25 to 30 had a documented diagnosis of overweight. Results: Among 299 patients, 204 patients were qualified for the diagnosis of Obesity due to their BMI> 30. However only 48.52 % ( 99 patients ) had a diagnosis of Obesity in the problem list. 95 patients were qualified for the diagnosis of Overweight due to their BMI > 25 but less than 30. However, only 3.15 % ( 3 patients ) of the patients had a diagnosis of overweight in their problem list . Majority of patients with obesity and overweight are not diagnosed in our outpatient clinic setting Conclusion: There is a great need to educate the physicians for early screening and identification of obesity and overweight . If we are not making the diagnosis in the problem list, then we are not acknowledging the disease process and are not subsequently treating this epidemic.

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## Anudeeksha Satheeshkumar

### Breakout Room #21

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## Peighton Andrews

### Breakout Room #22

Perceived Stress Level and Eating Habits of College Students at Texas Tech University  
Peighton Andrews, Temitope Ibiyemi, Dr. Wilna Oldewage-Theron  
Texas Tech University

College presents many lifestyle changes. These changes predispose college students to high-stress levels and unhealthy eating behaviors. The objective of this study is to assess stress levels of college students and examine the relationship between perceived stress and eating behaviors. Methods: An online survey was administered using Qualtrics to 331 students at Texas Tech University from September-November 2021. Perceived Stress Scale (PSS) assessed the stress levels, while eating behaviors were assessed by adapted questions from previously validated questionnaires. Data analysis was conducted using the Statistical Package for the Social Sciences (SPSS, version 28). Independent t-tests and Kruskal Wallis H tests were done to observe the statistical difference in demographic factors, and Pearson's correlation to examine bivariate relationships. Results: Overall, 16%, 65%, and 19% of students experienced low, moderate, and high stress levels within a 30-day period. Females ( $21.29 \pm 6.016$ ) reported a statistically significant higher PSS score than males ( $18.88 \pm 6.800$ ), ( $p=0.001$ ). Sophomores and seniors reported the highest stress levels with PSS scores, 22.35 and 22.66, respectively. Overall, stress did not vary significantly with living conditions, work hours, race/ethnicity. Higher perceived stress was negatively correlated with fruit and vegetable intake ( $r = -0.205$ ,  $p<0.001$ ; and  $r = -0.157$ ,  $p<0.001$  respectively). Conclusion: Findings suggest an association between high stress levels and unhealthy eating behaviors, emphasizing students face moderate to high stress levels. Stress management strategies are important future interventions that should be focused on.

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## Kalhara Menikdiwela

### Breakout Room #23

Metabolic Effects of Dietary pH, Protein and Fat Content in Diet-induced Obese Male and Female Mice  
Kalhara Menikdiwela<sup>1,2</sup>, Benjamin Madura<sup>1,2</sup>, Mohammad Yosofvand<sup>2,3</sup>, Joao Pedro Torres Guimaraes<sup>1,2</sup>, Shane Scoggin<sup>1</sup>, Moussa, Hanna<sup>2,3</sup>, Naima Moustaid-Moussa  
Department of Nutritional Sciences, Texas Tech University, Lubbock, TX; <sup>2</sup>Obesity Research Institute, Texas Tech University, Lubbock, TX; <sup>3</sup>Department of Mechanical Engineering, Texas Tech University, Lubbock, TX;

Higher intake of saturated fats, salts, and fatty proteins has been linked to metabolic diseases (e.g., obesity), in part through low-grade metabolic acidosis and inflammation. We hypothesized that metabolic health will be improved by consuming a diet containing pH-enhanced beef or casein diets, compared to a non-pH-enhanced diets. Methods: B6 male and female mice were randomized ( $n=10$ ) into 8 groups; low fat casein (LFC), pH-enhanced (with ammonia) LFC (LFCN), LF lean beef (LFB), LFCN, high fat casein (HFC), HFCN, HF beef (HFB), HFCN. Body weight and food intake were measured weekly for 12 weeks. White adipose tissue (WAT) was collected at study termination and used for analysis. Results: A main effect of diet (LF/HF) on fat pad weights was observed in males ( $F(1,71) = 91.94$ ,  $p < 0.0001$ ) and females ( $F(1,72) = 5.111$ ,  $p = 0.0268$ ). WAT histology indicated reduced adipocyte area ( $p<0.05$ ) in HFCN, HFB, HFCN groups compared to HFC in males. LF groups had lower adipocyte area ( $p<0.05$ ), compared to HFC and HFB groups. Additionally, in both males and females, protein levels of pAkt and pAMPK were upregulated in adipose tissue of HF with pH enhancement (HFCN, HFCN), compared to non-pH enhanced HF diets. Conclusions: In summary, metabolic benefits of increasing dietary pH include improved adipose tissue cellularity and improved insulin signaling. These findings merit further mechanistic studies in animals, and future clinical research to translate our results into humans by dissecting interactions between protein, pH and fat content in metabolic diseases.

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## Hsiao- Chun Wang

### **Breakout Room #24**

Social Cognitive Theory-based Nutrition Intervention to Improve Healthy Eating and Active Lifestyle among Rural Texas High School Students

Hsiao-Chun Wang, Naima Moustaid-Moussa, Wilna Oldewage-Theron, Leslie Thompson, Kembra Albracht, Jaehoon Lee & Oak-Hee Park

Nutritional Sciences, Texas Tech University

Our proposed Healthy Eating and Active Lifestyle among Rural Texas High School Students (HEALTH) Program is guided by the Social Cognitive Theory. We aim to deliver hands-on and technology-enhanced nutrition education to high school students in rural Texas to determine the effectiveness of a nutrition education intervention based on dietary intake, healthy cooking skills, physical activity, and stress management. Such intervention will foster life skills resulting in healthy behaviors and a reduction of risk for developing adulthood obesity. Several rural schools were recruited, with the intervention currently ongoing in one school. HEALTH program consists of 6-8 weekly lessons in school with pre-and post-intervention in a delayed-control design. A Qualtrics online survey will be administered to measure personal (cooking skills, nutrition knowledge, self-confidence, perceived stress, and sleep habit), environmental (home food environment and social support), and behavioral (dietary intake and physical activity) factors. Focus groups will be held at the end of the intervention to obtain participants' perspectives on their behavior changes, motivation and barriers, and the influence of physical and social environment. Twenty-seven students (11 delayed-control and 16 intervention) have consented to the study, a pre-test questionnaire has been collected, and the education component is currently ongoing. We expect significant differences between the intervention and delayed-control groups, in personal and behavioral factors. Given the limited information on how the rural Texas environment affects adolescents' physical and mental health, our research will provide insight into motivations and barriers to healthy behaviors that can be targeted for behavioral modifications to improve health.

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# Thank you for attending!

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## ORI Annual Meeting Planning Team

Naima Moustaid-Moussa  
Yujiao Zu  
Theresa Byrd  
Caroline Shipley

Jannette Dufour  
Conrad Lyford  
Lindsay Johnson  
Crystal Price

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## Poster Session Judges

Kembra Albracht  
Glenn Cummings  
Zhara Feizy  
Heejin Jun  
Conrad Lyford  
Oak-Hee Park  
Leslie Shen  
Tom Tenner

Greg Brower  
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Chanaka Kahathuduwa  
Hanna Moussa  
Harsh Shah  
Clarissa Streider-Barboza  
Dan Webster

Yujiao Zu

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Texas Tech University  
Texas Tech University Health Science Center

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**Obesity Research  
Institute**



## **WILLIAM T. FESTUCCIA**

Associate Professor  
Institute of Biomedical Sciences  
University of Sao Paulo, Brazil

**THURSDAY, MAY 19TH  
4:00 PM  
INNOVATION HUB: 103**

### ***Regulation of Adipose Tissue Metabolism by Nutrient Sensors***

#### **About the Presenter**

After completing his Ph.D. in Physiology and post-doctoral trainings at Laval University, Quebec, Canada, and Whitehead Institute for Biomedical Research, Cambridge, USA, Professor Festuccia started a laboratory at the Institute of Biomedical Sciences (ICB)/ University of Sao Paulo (USP), Brazil, devoted to investigate the molecular mechanisms by which nutrient sensors regulate metabolism and inflammation in adipocytes, hepatocytes and macrophages upon obesity and associated metabolic diseases. Professor Festuccia has published so far more than 90 articles, and currently acts as an editorial board member of American Journal Physiology Endocrinology and Metabolism and Cell Physiology.



# Get Involved with the ORI

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## Mission

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

## Objectives

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

## Values

- Integrity and trust
- Respect for interdisciplinary teamwork & diversity
- Mentoring & training
- Compassion & dedication
- Multidisciplinary & dynamic knowledge development and dissemination

## Vision

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



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