OBESITY RESEARCH INSTITUTE

TEXAS TECH
Research & Innovation

10th ANNUAL MEETING

FATTY LIVER DISEASE

FROM NAFLD TO MASLD:

NEW NAME SAME CHALLENGES

FROM BASIC TO COMMUNITY SCIENCE

May 7th, 2025

10 AM-5 PM

ACADEMIC EVENT CENTER
TTUHSC, LUBBOCK

RESEARCH & INNOVATION
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TEXAS TECH UNIVERSITY HEALTH SCIENCES CENTER™

AGENDA

10th Annual Meeting | May 7, 2025, 10:00 AM to 5:00 PM
Fatty Liver Disease - From NAFLD to MASLD: New Name, Same Challenges from Basic to Community Science

Dr. Naïma Moustaïd-Moussa, IOHI Executive Director & ORI Founding Director, TTU & TTUHSC
Dr. Kembra Albracht-Schulte, COCR Director, TTU
Dr. Jannette M. Dufour, COCR Co-Director, TTUHSC

10:00 - 10:30 **TTUS Welcome Remarks**
Dr. Tedd L. Mitchell, Chancellor, TTUS
Amy Cook, Associate Vice President of Research, TTU
Dr. Lance R. McMahon, Executive Vice President for Research and Innovation, TTUHSC
Dr. Deborah J. Clegg, Vice President for Research, TTUHSC El Paso

10:30 - 10:50 **Keynote Speaker | Moderated by Dr. Naïma Moustaïd-Moussa**
Dr. Abdelilah Arredouani, Senior Scientist and Associate Professor
Qatar Biomedical Research Institute & College of Health and Life Sciences,
Hamad Bin Khalifa University, Doha, Qatar
"The lncRNA Connection: Revealing Exendin-4's Therapeutic Potential Against Hepatic Lipid Buildup In Vitro"

10:50 - 10:55 **Q&A**

10:55 - 11:10 **Students Impact Talk | Moderated by Elyvine Ingabire Gasana, PhD Candidate, TTU,** and **Alexis R. Rodriguez, PhD Student, TTUHSC**

Ashti Morovati, Graduate Student, Nutritional Sciences, TTU
Hushyar Azari, Graduate Student, Kinesiology & Sports Management, TTU
Fereshteh Dehghani, Graduate Student, Nutritional Sciences, TTU

11:10 - 11:15 **Q&A**

11:15 - 11:35 **Faculty Short Talks: AM Session | Moderated by Dr. Brandt Schneider, Dean, Graduate School of Biomedical Sciences, Director of Institute of Anatomical Sciences, TTHUSC**

Dr. Lauren Gollahon, Professor & Associate Chair, Biological Sciences, TTU
"Dietary Protein and Its Modification Attenuate Liver Disease Progression in a Sex-dependent Manner"

Dr. Danielle E. Levitt, Assistant Professor, Kinesiology & Sport Management, TTU
"Systemic Clues to Hepatic Risk: Alcohol-induced Multi-organ Metabolic Dysfunction"

Dr. Heejin Jun, Assistant Professor, Nutritional Sciences, TTU
"Nonneuronal Cholinergic Communication Between Immune Cells and Hepatocytes"

Dr. Kembra Albracht-Schulte, Assistant Professor, Kinesiology & Sport Management, TTU
"Synergistic Strategies: Omega-3 PUFAs and HIIT for Metabolic Health"

11:35-11:45 **Q&A**

11:45 - 12:45 **Lunch and Networking**

12:45 - 1:15 **10th Annual Meeting Celebration**
Dr. Naïma Moustaïd-Moussa
Dr. Kembra Albracht-Schulte
Dr. Jannette M. Dufour

1:15 - 2:15 **Keynote Speakers | Moderated by Dr. Kembra Albracht-Schulte, COCR Director, TTU, Dr. Jannette M. Dufour, COCR Co-Director, TTUHSC** & **Hushyar Azari, MD, PhD Candidate, TTU**

Dr. Sameer Islam, Gastroenterologist, Lubbock Gastroenterology | Assistant Professor, Internal Medicine, TTUHSC
"Clinical Update on MASLD"

Dr. William T. Festuccia, Associate Professor, University of São Paulo, Brazil
"Futile Metabolic Cycles and Essential Fatty Acid Depletion on MAFLD"

Dr. Mahmoud Salama Ahmed, Assistant Professor, Pharmaceutical Sciences, TTUHSC
"Inhibition of EphB Tyrosine Kinase Forward Signaling in Metabolic Syndrome"

2:15 - 2:25 **Q&A**

2:25 - 2:55 **Faculty Short Talks (New or Early Career) PM Session | Moderated by Dr. Clint Krehbiel, Dean, Davis College of Agricultural Sciences & Natural Resources, TTU**

Dr. Malaiyalam Mariappan, Associate Professor, Cell Biology & Biochemistry, TTUHSC
"ER Stress Shapes Human Health and Disease"

Dr. Syed Badruddoza, Assistant Professor, Agricultural & Applied Economics, TTU
"When a Food Store Opens, Do Neighboring Stores Get More or Less Customer Traffic?"

Dr. Modhurima Dey Amin, Assistant Professor, Agricultural & Applied Economics, TTU
"The Food Stores Around You Might Matter More for Your Health Than You Think"

Dr. Ryan L. Brown, Assistant Professor, Human Development & Family Sciences, TTU
"Psychological Stress and Lifespan Health"

Dr. Qiwei Luna Wu, Assistant Professor, Communication Studies, Media & Communication, TTU
"Self-Tracking as Communication"

Dr. Li Li, Assistant Professor, Pharmacy Practice & Pharmaceutical Sciences, TTUHSC
"Analytical Tools for Biomedical Research"

2:55 - 3:00 **Q&A**

3:00 - 4:00 **Student/Postdoc Poster Competition & Coffee Break**

4:00 - 4:55 **Student/Postdoc Professional Development Session**
Moderated by Elyvine Ingabire Gasana, PhD Candidate, TTU, Hushyar Azari, PhD Candidate, TTU, and **Alexis R. Rodriguez, Ph.D. Student, TTUHSC**

Dr. Kembra Albracht-Schulte, Assistant Professor, Kinesiology & Sport Management, TTU
Dr. Kalhara Menikdiwela, Research Scientist II, TheWell Bioscience
Dr. Annelise Nguyen, Associate Dean of Research, Toxicology, TTU SVM

4:55 - 5:00 **Awards Announcements**

5:00 **Adjourn**

KEYNOTE SPEAKERS

Abdelilah Arredouani, PhD
Senior Scientist, Diabetes Research Center, Qatar Biomedical Research Institute
Associate Professor, College of Health and Life Sciences, Hamad Bin Khalifa University, Doha, Qatar

"The lncRNA Connection: Revealing Exendin-4's Therapeutic Potential Against Hepatic Lipid Buildup In Vitro"

Dr. Abdelilah Arredouani is a biomedical scientist whose main research interest is in diabetes and metabolic disorders. He earned his PhD in Biomedical Sciences from the Faculty of Medicine at the University of Louvain-La-Neuve in Belgium. He has worked at several esteemed institutions, including the Department of Neurosciences at Erasmus Medical Center in Rotterdam in the Netherlands, the Department of Pharmacology at Oxford University in UK, and the Department of Physiology and Biophysics at Weill Cornell Medicine in Qatar. In March 2012, he joined the Qatar Biomedical Research Institute (QBRI) as a Scientist in the Diabetes Research Center, where he currently serves as a senior scientist. He holds a joint associate professorship at the College of Health and Life Sciences, Hamad Bin Khalifa University.
He is actively involved in projects focusing on identifying predictive biomarkers for prediabetes and type 2 diabetes, investigating the mechanisms underlying metabolically healthy obesity, and examining the mechanisms behind the beneficial effect of GLP-1R agonists on non-alcoholic fatty liver disease.
Dr. Arredouani has been instrumental in identifying two-pore channels as receptors for nicotinic acid adenine dinucleotide phosphate (NAADP) and developing Ned-19, a specific antagonist of NAADP. He has published in high-impact journals such as Nature, Nature Chemical Biology, Diabetes, Journal of Translational Medicine, JBC, and others.

Sameer Islam, MD
Gastroenterologist, Lubbock Gastroenterology and Assistant Professor, Internal Medicine, Texas Tech University Health Science Center

"Clinical Update on MASLD"

Dr. Sameer Islam is a West Texas native growing up in Odessa, TX. For his entire career, he's balanced a love of working with patients and an obsession with cutting-edge scientific developments that are changing the way we see digestive health, and medicine as a whole.
His favorite aspect of being a doctor is making his patients feel better. That process begins by being able to provide answers to his patients. He realizes that most people are frustrated by the healthcare system due to the lack of an actual answers patients receive regarding their health problems.
As a functional gastroenterologist, he is able to provide patients with more treatment options than those offered by traditional Western Medicine.

KEYNOTE SPEAKERS

William T Festuccia, PhD
Associate Professor, Institute of Biomedical Sciences, University of São Paulo, Brazil

"Futile Metabolic Cycles and Essential Fatty Acid Depletion on MAFLD"

Dr. Festuccia is an Associate Professor and Director of the Metabolic Phenotyping Core Facility at the Institute of Biomedical Sciences (ICB), University of São Paulo, Brazil. He devotes significant efforts to investigating the molecular mechanisms by which nutrient sensors regulate metabolism in adipocytes, hepatocytes, and macrophages. He has published over 105 articles, has an H-Index of 42, and approximately 5791 citations (Google Scholar). He is an editorial board member of the American Journal of Physiology, Endocrinology and Metabolism and Cell Physiology. Dr Festuccia is funded through several research grants from the São Paulo Research Foundation (FAPESP), a major research funding agency in Brazil. He has documented expertise in metabolomic/lipidomic analyses, lipid metabolism, and insulin signaling.

Mahmoud Salama Ahmed, BPharm, PhD
Assistant Professor, Pharmaceutical Sciences, Texas Tech University Health Science Center

"Inhibition of EphB Tyrosine Kinase Forward Signaling in Metabolic Syndrome"

Mahmoud Salama Ahmed is an assistant professor at department of pharmaceutical sciences at Texas Tech University Health Sciences Center (TTUHSC). Prior to TTUHSC in 2022, he was trained as a medicinal chemist to receive his PhD from the department of chemistry and biochemistry at South Dakota State University (SDSU). Then, he joined Kemin Industries, Iowa; as a postdoctoral research scientist. In 2018, he joined UT Southwestern medical center as a research instructor.
Dr. Ahmed's research program at TTUHSC focuses on reimagining a platform to develop small molecules and/or pair established FDA therapeutics to target critical diseases in human health by bringing molecular modeling and structure-informed machine learning into the genomics era. Dr. Ahmed published in prestigious peer reviewed journals including Nature, Nature metabolism, Nature cardiovascular, Journal of clinical investigation, Proceedings of National Academy of Sciences, and European Journal of Medicinal Chemistry. Recently, he attracted R-01 funding supported by NINDS/NIH.

NOTES

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Department of Kinesiology & Sports Management, TTU
Graduate School of Biomedical Sciences, TTUHSC
Graduate Nutrition Organization, TTU

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Alexis R. Rodriguez, TTUHSC
Alex H. Scoggin, TTU
Clarissa Strieder Barboza, TTU
Leslie Thompson, TTU
Jason Van Allen, TTU

Poster Session Judges

Abdelilah Arredouani, QBRI
Hushyar Azari, TTU
Jeremy D. Bailoo, TTUHSC
Himaja Bikku, TTU
Anand Chakroborty, TTUHSC
Janghan Choi (JC), TTU
Fereshteh Dehghanik, TTU
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WELCOME

Naïma Moustaïd-Moussa, PhD, DFASN, FAHA, FTOS, FNAI
Founding Director, Obesity Research Institute, Texas Tech University
Executive Director, Institute for One Health Innovation, https://www.depts.ttu.edu/onehealth/
Texas Tech University and Texas Tech Health Sciences Center
Paul W. Horn Distinguished Professor, Nutritional Sciences, Texas Tech University
Professor, Cell Biology and Biochemistry, Texas Tech Health Sciences Center
President-Elect, The American Society for Nutrition (https://nutrition.org/)
Member, NASEM Board on Agriculture & Natural Resources (BANR)

Professor Moustaïd-Moussa is the Inaugural Executive Director for the system-wide Institute for One Health Innovation (IOHI) and Founding Director of the Obesity Research Institute at TTU and TTUHSC. She is a Paul W. Horn Distinguished Professor at TTU Nutritional Sciences, and Professor at TTUHSC Cell Biology and Biochemistry. She directs Nutrigenomics, Inflammation and Obesity Research (NIOR) conducting basic and integrated nutrition and obesity research, with emphasis on nutrient-gene interactions, and the role of the adipose endocrine function (renin angiotensin system), and heat shock proteins in metabolic diseases. Current research focuses on bioactive compounds (including fish oil, tart cherry anthocyanins, curcumin, and other polyphenols) that reduce obesity-associated white fat inflammation, activate brown fat, reduce systemic, adipose- and neuro-inflammation and aging-related metabolic dysfunctions, using cells, rodents, and model organisms (C. elegans). She published over 200 peer-reviewed papers from research funded by federal agencies, national and international foundations, and industry.

Professor Moustaïd-Moussa is a Distinguished Fellow of the American Society for Nutrition (DFASN), Fellow of the AHA (FAHA), a Fellow of The Obesity Society (FTOS), and a Fellow of the National Academy of Inventors (NAI). She received several awards sponsored by ASN (2012 Outstanding Investigator award, 2015 Pfizer Consumer Healthcare Nutritional Sciences award, 2020 Korean Nutrition Society Award). She has been very dedicated to mentoring students, postdocs, and early career investigators and was awarded mentoring awards by TTU (2018 Nancy J Bell Outstanding Graduate Mentor Award, 2019 Outstanding Faculty Mentor for Undergraduate Research, 2021 Barnie E. Rushing J. Distinguished Faculty Research Award in STEM, and a Horn Distinguished Professorship (This appointment is the highest honor the university may bestow on members of its tenured faculty to recognize and facilitate retention of faculty members who have gained national or international distinction), and the 2023 Wolfe International Scholars Award). She provided significant outreach and professional services nationally and internationally and is currently member of the National Academies' Board on Agriculture & Natural Resources (BANR) and serves as President-Elect for ASN.

Kembra Albracht-Schulte, PhD
Director, Center of Excellence in Obesity and Cardiometabolic Research, Texas Tech University
Assistant Professor, Kinesiology and Sport Management, Texas Tech University

Dr. Kembra Albracht-Schulte is an Assistant Professor and Director of the Nutrition, Exercise, and Translational (NExT) Medicine Lab in the Kinesiology and Sport Management Department. She earned her B.S. in Exercise Science at Lubbock Christian University, M.S. in Exercise Science at Texas Tech University, and Ph.D. in Nutritional Sciences at Texas Tech University. Dr. Albracht-Schulte's research efforts aim to understand the mechanistic and potentially synergistic effects of exercise and nutrition interventions by conducting basic, clinical, and translational research.

Jannette M Dufour, PhD
Co-Director, Center of Excellence in Obesity and Cardiometabolic Research, Texas Tech University
University Distinguished Professor and Chair, Cell Biology and Biochemistry,
School of Medicine, Texas Tech University Health Sciences Center

Dr. Jannette M. Dufour is a University Distinguished Professor and Chair of the Department of Cell Biology and Biochemistry in the School of Medicine at Texas Tech University Health Sciences Center and Co-Director of the Center of Excellence in Obesity and Cardiometabolic Research. 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 tests the feasibility of using immune privileged Sertoli cells for cell-based gene therapy and examining the mechanism(s) of Sertoli cell immune protection to improve the 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 the American Society for Reproductive Immunology (2022, 2024), American Society of Andrology (ASA; 2007, 2016, 2023), Society for the Study 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, 2024) and the President's Team Teaching Award (2019, 2020), and the Graduate School of Biomedical Sciences Dean's Teaching Award (2023).

Chancellor Tedd L. Mitchell, MD
Texas Tech University System

Tedd L. Mitchell, M.D., was named the fifth chancellor of the Texas Tech University System (TTU System) on Oct. 25, 2018.

As chancellor, Mitchell is the CEO of a five-university higher education enterprise with an operating budget of more than $3 billion. The TTU System consists of Texas Tech University (TTU), Texas Tech University Health Sciences Center (TTUHSC), Angelo State University (ASU), Texas Tech University Health Sciences Center El Paso (TTUHSC El Paso), and Midwestern State University (MSU Texas).

Collectively, the System enrolls approximately 64,000 students, has an endowment valued at more than $3 billion and operates at 21 academic locations in 17 cities (15 in Texas, two internationally).

Mitchell works collaboratively with the TTU System Board of Regents, the TTU System Administration and university presidents to enhance the System's profile and support shared missions of advancing higher education, health care, research and community outreach. Additionally, Mitchell guides the TTU System's engagement with elected officials in Austin and federal leaders in Washington, D.C., to further increase funding and support.

Mitchell first joined the TTU System when he was named the eighth president of TTUHSC on May 17, 2010. He held a dual appointment as chancellor and president for approximately one year until deciding to close his presidential tenure in 2019 after nearly a decade at the helm of TTUHSC. He is the longest-tenured president in the 52-year history of the university, and led the institution to monumental milestones, record growth in enrollment, academic excellence and physical campus expansion.

Amy Cook, JD
Associate Vice President for Research, Research and Innovation, Texas Tech University

Amy Cook, J.D., is the Associate Vice President for Research Operations in the Office of Research and Innovation, where she leads a broad portfolio that includes research services, export and security compliance, research metrics and intelligence, and facilities. With more than 20 years of experience in law and research administration, Amy helps drive smart policy, strengthen compliance frameworks, and support data-informed decision-making to advance the university's research mission.

Lance McMahon, PhD
Executive Vice President for Research & Innovation,
Texas Tech University Health Sciences Center

Lance R. McMahon, Ph.D., is the Executive Vice President for Research and Innovation at Texas Tech University Health Sciences Center (TTUHSC). He is a University Distinguished Professor of Pharmaceutical Sciences in the Jerry H. Hodge School of Pharmacy and a Professor of Medical Education in the School of Medicine. He is a member of the TTUHSC Executive Council, chairs the TTUHSC Research Council, and is a member of the Texas Tech Research Park Board. Dr. McMahon has over 20 years of experience serving as a grant reviewer for the National Institutes of Health Center for Scientific Review and the Department of Defense Congressionally Directed Medical Research Program. He has secured $25M in NIH funding as Principal Investigator and has published 140 peer-reviewed articles focusing on brain drug discovery and development. He has held leadership positions within the American Society of Pharmacology and Experimental Therapeutics and the American Association of Pharmaceutical Scientists. Dr. McMahon is committed to TTUHSC's vision to transform healthcare through innovation and collaboration, focusing on advancements in cancer, neuroscience, infectious disease, and cardiometabolic disorders.

Deborah J. Clegg, PhD
Vice President, Office of Research, Texas Tech University Health Sciences Center El Paso

Dr. Clegg is a known expert in the field of obesity, sex hormones, and metabolism, with a specific interest in nutrition and how it interacts with physiology. She has authored over 150 articles in impactful journals such as The New England Journal of Medicine, JAMA, American Journal of Physiology, and the National Kidney Foundation. According to a peer-reviewed database, she is listed in the top 2% of the most cited/impactful investigators out of more than 6 million cited in science journals worldwide. Dr. Clegg is the Vice President for Research at the Paul Foster School of Medicine/Texas Tech Medical School in El Paso, Texas. Dr. Clegg and her research have been featured in many forms of media, including the television program The View and the HBO series entitled 'Weight of the Nation,' as well as in the popular press, including magazines such as Vogue, Mademoiselle, Ladies Home Journal, and Nature. Dr. Clegg has conducted her own basic science research as well as participated in clinical and translational research for over 25 years.

KEYNOTE SPEAKER

Introduced by Naïma Moustaïd-Moussa, PhD, DFASN, FAHA, FTOS, FNAI, Founding Director, ORI, TTU

Abdelilah Arredouani, PhD

Senior Scientist, Diabetes Research Center, Qatar Biomedical Research Institute
Associate Professor, College of Health and Life Sciences, Hamad Bin Khalifa University, Doha, Qatar

"The lncRNA Connection: Revealing Exendin-4's Therapeutic Potential Against Hepatic Lipid Buildup In Vitro"

STUDENTS IMPACT TALKS

Moderated by Elyvine Ingabire-Gasana, PhD Candidate, Nutritional Sciences, TTU &
Alexis R. Rodriguez, PhD Student, Cell Biology and Biochemistry, TTUHSC

IP T 01

Adipocyte-Microglia Crosstalk in Alzheimer's Disease: The Anti-neuroinflammatory Role of Eicosapentaenoic Acid (EPA)

Ashti Morovati[1], Mahsa Yavari[1], Latha Ramalingam[1], Breanna Harris[2], Shane Scoggin[1], Yujiao Zu[1], and NaÏma MoustaÏd-Moussa[1,3,4]. Nutritional Sciences, Texas Tech University, Lubbock

Objective: Alzheimer's disease (AD) is partially driven by microglia-mediated chronic neuroinflammation, which may be exacerbated by obesity. We previously demonstrated that the omega 3 polyunsaturated fatty acid, eicosapentaenoic acid (EPA), reduced systemic and neuroinflammation in diet-induced obese amyloidogenic AD mice. Here, we hypothesized that adipocyte conditioned medium (ACM) will induce microglial inflammation, while EPA, by reducing adipocyte-secreted inflammatory cytokines, will mitigate adipose-associated microglial inflammation and altering metabolism.
Methods: We used SIM-A9 microglia cell line and 3T3-L1 adipocytes to determine the effects of EPA on microglia-adipocyte crosstalk. First, we tested the effects of 100 µM EPA on lipopolysaccharide (LPS)-induced inflammation on SIM-A9. Next, we exposed SIM-A9 cells to ACM from 3T3-L1 differentiated with or without EPA. SIM-A9 and 3T3-L1 cells and medium were collected to measure inflammatory genes and cytokines using qRT-PCR and ELISA. Data were analyzed by one-way ANOVA using GraphPad Prism9.
Results: In SIM-A9 microglia, EPA significantly reduced LPS-induced cytokine and mRNA levels of interleukin 6 (IL-6, $p<0.0001$, $p=0.01$) and monocyte chemoattractant protein-1 (Mcp1, $p=0.01$, $p=0.03$) in medium and cells, respectively. In 3T3-L1 adipocytes, EPA significantly decreased MCP1 cytokine level in medium ($p=0.03$). In addition, ACM exposure induced microglial inflammation as indicated by upregulation of MCP1 secretion and mRNA levels ($p<0.0001$, $p=0.01$). However, ACM from EPA-treated adipocytes decreased Mcp1, Nlrp3, and p65 mRNA levels ($p=0.02$; 0.02, and 0.04, respectively) in microglia.
Conclusion: Our data confirmed that adipocytes play a significant role in promoting microglia inflammation and EPA treated adipocytes reduced the negative impact of adipocyte-secreted factors on microglia inflammation.

IP T 02

Combined Effects of Fish Oil Supplementation and High-Intensity Interval Training on Lipid Profiles in Individuals with Overweight or Obesity: Preliminary Results

Hushyar Azari[1], Salvador Galindo[2], Diana Combs[1], Chathurika S. Dhanasekara[3], Rama Chemitiganti[4], Oak-Hee Park[5], NaÏma MoustaÏd-Moussa[6], Kembra Albracht-Schulte[1]

[1]Department of Kinesiology & Sport Management, and Obesity Research Institute, Texas Tech University, Lubbock, TX, USA; [2]School of Medicine, Texas Tech University Health Sciences Center, Lubbock, Texas, USA; [3]Department of Surgery, Texas Tech University Health Sciences Center, Lubbock, Texas, USA; [4]Center of Excellence for Diabetes and Endocrinology, Texas Tech University Health Sciences Center, School of Medicine at Permian Basin, Odessa, TX, USA; [5]Department of Interdisciplinary Human Sciences, and Obesity Research Institute, Texas Tech University, Lubbock, TX, USA; [6]Institute for One Health Innovation, Texas Tech University and Texas Tech Health Sciences Center; Obesity Research Institute, and Department of Nutritional Sciences, Texas Tech University; Lubbock, TX, USA

Objectives: Obesity is associated with dyslipidemia, contributing to higher cardiometabolic risk. Lifestyle interventions including aerobic exercise and fish oil, are effective strategies for improving cardiometabolic health. Fish oil, containing long chain omega-3 (n-3) polyunsaturated fatty acids (PUFA), effectively lower serum triglycerides (TG); however, their effects on high-density lipoprotein (HDL) cholesterol may vary. By contrast, high-intensity interval training (HIIT) is a well-established intervention for improving HDL cholesterol in addition to enhancing overall metabolic health; therefore, we hypothesized that the combined intervention with n-3 PUFA and HIIT will lead to more favorable lipid profiles in individuals with overweight or obesity.
Methods: participants with a body mass index (BMI) ≥ 25 received either 4 grams n-3 PUFA per day or safflower oil as placebo for 8 weeks. From week 4, one n-3 PUFA and one placebo group completed a 4-week HIIT program. Control groups performed low-intensity training (LIT). Serum samples were collected as baseline, week 4, and week 8. Results: The n-3 PUFA + HIIT group showed a significant reduction in TG levels after 4 weeks ($\beta = -41.02$, $p = 0.048$). No significant interactions were observed with HDL and other lipid parameters.
Significance: This study provides novel evidence that integrating n-3 PUFA with HIIT effectively reduces TG levels, highlighting a targeted, non-pharmacological approach for dyslipidemia management in at-risk individuals.
Conclusions: The combination of n-3 PUFA and HIIT significantly improves TG levels, reinforcing the potential of lifestyle-based interventions for cardiometabolic health. Further research is warranted to explore its long-term effects on lipid metabolism.

IP T 03

A Short-term Exposure to BCAAs Induces Sweet Tooth in Mice

Fereshteh Dehghani, Andrew C. Shin
Nutritional Sciences, Texas Tech University, Lubbock

Objectives: Overconsumption of palatable food is a major contributor to obesity. Elevated branched-chain amino acids (BCAAs) levels are linked to obesity and type 2 diabetes. Low protein and/or BCAA-restricted diets induce the expression of the hepatokine fibroblast growth factor 21 (FGF21), which reduces sugar intake and preference. Whether BCAAs alter reward functions through FGF21 remains unclear. Therefore, we tested short-term BCAA exposure on sucrose consumption and plasma FGF21 levels.
Methods: 8-week-old male C57Bl/6 mice received intraperitoneal injections of either saline or BCAAs (225 nM) twice daily for 7 days. Sucrose intake was measured before and after the intervention. Dopamine-related gene expression was measured in brain reward regions (ventral tegmental area (VTA), dorsal striatum (DS), and amygdala), brainstem and cerebellum. Plasma BCAAs and FGF21 were measured using enzymatic and ELISA assays.
Results: Plasma BCAAs were higher in the BCAA group compared to saline group. While sucrose intake was identical at baseline, BCAA treatment increased sucrose intake. This was associated with lower plasma FGF21 in BCAA-treated mice. Expression of genes related to reward and dopamine signaling in VTA, amygdala, DS, brainstem and cerebellum in the brain was altered in BCAA-treated group compared to saline controls. These results support the “reward-deficit hypothesis” suggesting that BCAA-induced lowering of brain reward and dopamine signaling can induce compensatory overeating of sucrose.
Conclusions: BCAAs can acutely promote indulgence in palatable sucrose solution that is associated with lower plasma FGF21. Determining the chronic effects of BCAAs on sucrose preference and FGF21 as a possible mediator is warranted.

FACULTY SHORT TALKS: AM SESSION

Moderator:

Brandt L Schneider, PhD
Dean, Graduate School of Biomedical Sciences,
Director of Institute of Anatomical Sciences
Texas Tech University Health Sciences Center

Brandt 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. His research involves genetic analyses of mechanisms of yeast cell cycle control and their role in cellular lifespan. He is currently the Co-Director with Dr. Kerry Gilbert of the Institute of Anatomical Sciences. Brandt is an avid golfer and loves spending time with his family.

Speakers:

Lauren S. Gollahon, PhD
Professor and Associate Chair, Biological Sciences, Texas Tech University

"Dietary Protein and Its Modification Attenuate Liver Disease Progression in a Sex-dependent Manner"

Dr. Gollahon is a Professor and Associate Chair in the Department of Biological Sciences at Texas Tech University. Dr. Gollahon's research projects investigate aspects of breast cancer development, progression, and metastasis, testing anticancer capabilities of natural products, and exploring modification of dietary protein sources with ammonium hydroxide in a diet-induced obesity setting to mitigate liver dysfunction and onset of liver cancer. Additionally, she teaches Pathophysiology and Human Genetics. Dr. Gollahon's research background includes a B.A. in Marine Biology from Barrington College, an M.S. in Zoology, and a Ph.D. in Veterinary Anatomy from Texas A&M University. She performed postdoctoral fellowships at UT MD Anderson Cancer Center and UT Southwestern Medical Center in breast cancer. She promotes active, interdisciplinary projects with colleagues in Nutrition Sciences, Industrial Engineering, Environmental Toxicology, Animal Sciences, and the TTU School of Veterinary Medicine. She has trained 18 PhD students who hold positions in both academia and industry and 19 MS students, most of whom have gone into professional health careers.

Danielle E. Levitt, PhD, CSCS*D
Assistant Professor of Exercise Physiology
Director, Metabolic Health and Muscle Physiology Laboratory, Kinesiology and Sport Management,
Texas Tech University

"Systemic Clues to Hepatic Risk: Alcohol-induced Multi-organ Metabolic Dysfunction"

Dr. Danielle Levitt earned her PhD in Biology with a concentration in Exercise Physiology at the University of North Texas. She then completed a postdoctoral fellowship at LSU Health Sciences Center-New Orleans in the Department of Physiology and the Comprehensive Alcohol-HIV/AIDS Research Center. She is currently an Assistant Professor of Exercise Physiology and Director of the Metabolic Health and Muscle Physiology Laboratory at Texas Tech University. Her long-term research goal is to understand the mechanisms by which aging and lifestyle factors, particularly alcohol and substance misuse, contribute to metabolic dysfunction and to develop effective interventions to improve metabolic outcomes in affected individuals. Her work is currently funded by the National Institute on Aging and the National Strength and Conditioning Association Foundation.

Heejin Jun, PhD
Assistant Professor, Nutritional Sciences, Texas Tech University

"Nonneuronal Cholinergic Communication Between Immune Cells and Hepatocytes"

Heejin Jun, Ph.D., is an Assistant Professor in the Department of Nutritional Sciences at Texas Tech University. Her research focuses on understanding how nutrient and energy metabolism are regulated during physiological transitions and reprogrammed in pathological conditions, with particular emphasis on adipose tissue and liver biology. Dr. Jun earned her Ph.D. in Nutritional Biochemistry from Korea University in Seoul, South Korea, and completed her postdoctoral training at Pennington Biomedical Research Center and the University of Michigan.

Kembra Albracht-Schulte, PhD
Assistant Professor, Kinesiology and Sport Management, Texas Tech University

"Synergistic Strategies: Omega-3 PUFAs and HIIT for Metabolic Health"

10TH ANNUAL MEETING CELEBRATION

Kembra Albracht-Schulte, PhD, Director, COCR, TTU & **Jannette M Dufour, PhD**, Co-Director, COCR, TTU

From ORI to COCR: New Name, Same Mission and Vision

Our Vision
Achieve national leadership and recognition in interdisciplinary obesity and cardiometabolic research and education.

Our Mission
Develop interdisciplinary basic clinical and community translational research to prevent and treat obesity and cardiometabolic diseases along with their related complications, using innovative collaborations and strategic partnerships.

The Obesity Research Institute (ORI), formally approved by the TTUS Board of Regents in 2019, was renamed the **Center of Excellence in Obesity and Cardiometabolic Research (COCR)** in 2025. The new center is now strategically realigned with the system-wide Institute for One Health Innovation (IOHI), jointly funded by TTU and TTUHSC, to better reflect its expanded focus on obesity and cardiometabolic health, and its integration within the TTU system.

With Dr. Moustaïd-Moussa's new role as Inaugural Executive Director for IOHI, the leadership of COCR has transitioned to Dr. Kembra Albracht-Schulte (TTU) as Director, and Dr. Jannette Dufour (TTUHSC) as Co-Director. COCR will continue to serve as a central hub for cutting-edge research, bringing together scientists and experts from across the TTU System to advance scientific discovery in obesity and cardiometabolic health.

The COCR was originally established in 2013 as the Obesity Research Cluster (ORC) within the College of Health and Human Sciences (CoHHS), supported by both CoHHS and OR & I, with Dr. Naïma Moustaïd-Moussa as Founding Director, and Dr. Jannette Dufour (TTUHSC) as Associate Director.

KEYNOTE SPEAKER

Moderated by Kembra Albracht-Schulte, PhD, Director, COCR, TTTU | **Jannette M Dufour, PhD,** Co-Director, COCR, TTU | **Hushyar Azari, MD, PhD Candidate,** Kinesiology and Sport Management, TTU

Introduction: Kembra Albracht-Schulte, PhD, Director, COCR, Texas Tech University

Sameer Islam, MD

Gastroenterologist, Lubbock Gastroenterology and Assistant Professor, Internal Medicine, Texas Tech University Health Science Center

"***Clinical Update on MASLD"***

Introduction: Jannette M Dufour, PhD, Co-Director, COCR, Texas Tech University Health Sciences Center

William T Festuccia, PhD

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

"Futile Metabolic Cycles and Essential Fatty Acid Depletion on MAFLD"

Introduction: Hushyar Azari, MD, PhD Candidate, Kinesiology and Sport Management, Texas Tech University

Mahmoud Salama Ahmed, BPharm, PhD

Assistant Professor, Pharmaceutical Sciences, Texas Tech University Health Science Center

"Inhibition of EphB Tyrosine Kinase Forward Signaling in Metabolic Syndrome"

FACULTY SHORT TALKS: PM SESSION

Moderator:

Clint Krehbiel, PhD
Dean, Davis College of Agricultural Sciences and Natural Resources, Texas Tech University

Clint Krehbiel joined the Davis College of Agricultural Sciences and Natural Resources at Texas Tech University as Dean in January 2023. He arrived in Lubbock after serving as the Marvel L. Baker Department Head and Professor of Animal Sciences at the University of Nebraska in Lincoln since 2017. Krehbiel earned his bachelor's (1988) and master's (1990) degrees in animal science and industry from Kansas State University and his doctorate in animal science with a concentration in ruminant nutrition from the University of Nebraska in 1994. Before joining the University of Nebraska, Krehbiel served on the faculty at Oklahoma State University for 17 years, leaving as Regents Professor and Dennis and Marta White Endowed Chair of Ruminant Nutrition and Health and the assistant head of the Department of Animal Science. Before Oklahoma State, Krehbiel served four years as an assistant professor of ruminant nutrition at New Mexico State University. He also was a postdoctoral research associate at the Roman L. Hruska U.S. Meat Animal Research Center in Clay Center, Neb. He is a member of the American Society of Animal Science (ASAS), the American Dairy Science Association, the American Registry of Professional Animal Scientists, and the Plains Nutrition Council. Krehbiel has received the ASAS Southern Section Outstanding Young Animal Scientist Award for Research, the Oklahoma State Department of Animal Science Tyler Award, the James A. Whatley Award for Meritorious Research in Agricultural Science, the Gamma Sigma Delta Research Scientist Award of Merit, the Sarkey's Distinguished Professor Award, the OSU University Service Award, and the American Feed Industry Association ASAS Ruminant Nutrition Award. Clint and his wife Shelly have three grown daughters.

Speakers:

Malaiyalam Mariappan, PhD
Associate Professor, Cell Biology and Biochemistry, Texas Tech University Health Sciences Center

"How ER Stress Shapes Human Health and Disease"

Dr. Mariappan is a cell biologist with a strong research background in endoplasmic reticulum (ER) biology. He is currently an Associate Professor in the Department of Cell Biology and Biochemistry at Texas Tech University Health Sciences Center (TTUHSC). Dr. Mariappan earned his Ph.D. from the University of Göttingen, Germany, and completed his postdoctoral training at the National Institutes of Health (NIH) in Bethesda. Prior to joining TTUHSC, he served as an Assistant and Associate Professor at the Yale School of Medicine. His current research focuses on ER stress and the unfolded protein response (UPR), particularly their roles in human diseases.

Syed Badruddoza, PhD
Assistant Professor, Agricultural & Applied Economics, Texas Tech University

"When a Food Store Opens, Do Neighboring Stores Get More or Less Customer Traffic?"

Dr. Syed Badruddoza is an Assistant Professor of Agricultural and Applied Economics at Texas Tech University. His research explores agribusiness, food markets, and consumer behavior. Before joining Texas Tech, he worked with the World Bank and the Institute for Inclusive Finance and Development. He teaches courses on causal inference, applied machine learning, and price theory. He holds a Ph.D. in Economics and an M.S. in Statistics from Washington State University.

Modhurima Dey Amin, PhD
Assistant Professor, Agricultural & Applied Economics, Texas Tech University

"The Food Stores Around You Might Matter More for Your Health Than You Think"

Dr. Modhurima Dey Amin is an Assistant Professor in the Department of Agricultural and Applied Economics at Texas Tech University. Her research focuses on applied econometrics, data science, and statistical modeling, with applications in food access and safety, agricultural marketing, energy economics, and precision agriculture. Before joining Texas Tech, Dr. Amin worked as an agricultural economist at Innov8Ag, a precision agriculture research company partnered with Microsoft. She teaches econometrics, business analytics, agribusiness finance, corporate finance, and core economics courses. Dr. Amin holds a Ph.D. in Economics and an M.S. in Statistics from Washington State University, as well as an M.S. in Applied Financial Economics from Illinois State University.

Ryan L. Brown, PhD
Assistant Professor, Human Development & Family Sciences, Texas Tech University

"Psychological Stress and Lifespan Health"

Ryan L. Brown is a social-health psychologist, Assistant Professor of Human Development and Family Sciences, and Director of Scientific Communications for the National Institute on Aging's Stress Measurement Network. Her research takes a psychoneuroimmunology perspective to investigate the role of stress-response processes through major life transitions to inform our understanding of social contributions to human aging. She is particularly interested in how fundamental experiences of love and loss affect stress-response processes to shape mental and physical health across the lifespan.

Qiwei Luna Wu, PhD
Assistant Professor, Communication Studies, College of Media and Communication, Texas Tech University

"Self-Tracking as Communication"

Qiwei Luna Wu, PhD is an assistant professor in the Department of Communication Studies specializing in health communication. Her interdisciplinary research focuses on the impact of communicative environments such as media and clinical communication on health outcomes. Dr. Wu employs quantitative methods, primarily statistical modeling, to analyze these dynamics. She has published her work in respected journals including Health Communication, Social Science & Medicine, Patient Education & Counseling, PEC Innovation, and the Journal of Broadcasting & Electronic Media.

Li Li, PhD
Assistant Professor, Pharmacy Practice & Pharmaceutical Sciences,
Texas Tech University Health Sciences Center

"Analytical Tools for Biomedical Research"

Dr. Li is an Assistant Professor in the Departments of Pharmacy Practice and Pharmaceutical Sciences at the Jerry H. Hodge School of Pharmacy. She also serves as the Director of the North Texas Clinical Pharmacology Cancer Core. Dr. Li is an interdisciplinary scientist applying mass spectrometry, cryo-electron microscopy, and other advanced analytical tools to elucidate the structure and evaluate the level of disease biomarkers. Her work focuses on discovering new biomarkers diagnostic for neurodegenerative diseases and cancer. Her group also works to combine mass spectrometry-based analytical platforms with cell disease models to explore novel drug targets.

STUDENT/POSTDOC PROFESSIONAL DEVELOPMENT SESSION

Moderators:

Hushyar Azari, MD, PhD Candidate
Kinesiology and Sport Management, Texas Tech University

Hushyar Azari is a third-year Ph.D. candidate in Exercise Physiology at the Department of Kinesiology and Sport Management, Texas Tech University, holding an M.D. degree from Urmia University of Medical Sciences, Iran. He is currently a research assistant at the Nutrition, Exercise, and Translational Medicine lab (NExT med) under the supervision of Dr. Kembra Albracht-Schulte. His research passion lies in clinical studies on the effects of combined interventions, integrating exercise and nutrition to combat obesity and its associated comorbidities with a specific focus on gut microbiota dysbiosis and Metabolic Dysfunction Associated Steatotic Liver Disease (MASLD). Before joining Texas Tech, Hushyar practiced as a family physician in Kurdistan, Iran, for 4 years. His dissertation project explores the combined effectiveness of High-Intensity Interval Training (HIIT) and omega-3 supplementation in improving obesity-associated gastrointestinal dysbiosis and its implications for liver health.

Elyvine Ingabire-Gasana, PhD Candidate
Nutritional Sciences, Texas Tech University

Elyvine Ingabire-Gasana is a third-year Ph.D. Candidate pursuing Nutritional Sciences at Texas Tech University. She holds a Bachelor of Science in Nutritional Sciences and a minor in Women and Gender Studies from Michigan State University.

Gasana is currently serving as the president of the graduate nutrition organization at TTU for the 2023-2024 academic year. Gasana is passionate about alleviating the effects of food insecurity, particularly among children and women. Before joining Texas Tech, Gasana served as a zero-hunger intern for the Congressional Hunger Center and CARE, USA, and in Rwanda's National Early Child Development program, an agency that fights against chronic malnutrition in Rwanda. Gasana's dissertation project is about assessing the effect of harvest lentil vegetable blend coupled with a theory-based nutrition education intervention in alleviating malnutrition among children 6-59 months in Northwest Kenya.

Alexis R. Rodriguez, PhD Student
Cell Biology and Biochemistry, Texas Tech University Health Sciences Center

Alexis R. Rodriguez is currently a PhD student in the Department of Cell Biology and Biochemistry at Texas Tech University Health Sciences Center. Received her BSA in Biology at the University of Texas at Austin in 2020 and MS in Biotechnology from Texas Tech University Health Sciences Center in 2022. She is a TTUHSC GSBS Dean's Scholar recipient and is currently serving as the Vice-Director of Marketing for Student Research Week 2025. Her current research focuses on studying the immune privilege of Sertoli cells to improve the outcomes of allo- and xeno-transplantation. Additionally, she is studying the mechanism by which transplanted Sertoli cells protect co-transplanted islet cells as a treatment for diabetes. Research interests include studying Sertoli cell immune privilege and immunoprotection of transplanted cells and examining the use of Sertoli cells to protect co-transplanted islet cells. Future research collaboration interests are transplantation, immune regulation and diabetes.

Panelist:

Kembra Albracht-Schulte, PhD
Director, Center of Excellence in Obesity and Cardiometabolic Research
Assistant Professor, Kinesiology & Sport Management, Texas Tech University

Kalhara Menikdiwela, PhD
Research Scientist II
TheWell Bioscience

Dr. Kalhara Menikdiwela is a Research Scientist II at TheWell Bioscience. Kalhara earned his doctorate from Texas Tech University, where he investigated the mechanisms linking adipose renin angiotensin system to inflammation and endoplasmic reticulum stress. During his time at the NIOR Lab, Kalhara worked on several projects where his research findings have been recognized and published in numerous peer-reviewed journals.

As a postdoctoral researcher at Rutgers University in New Brunswick-NJ, Kalhara explored the novel role of intestinal fatty acid binding proteins in regulating glucose metabolism and energy homeostasis through specific ligand binding using numerous models including 3D organoids.

At TheWell Bioscience, he oversees the 3D organoid modeling unit primarily focusing on developing and refining various VitroGel® hydrogel systems to support organoid cultures. Further, he uses induced pluripotent stem cells (iPSCs) derived organoids to develop 3D biomimicking platforms for drug screening and disease modeling applications.

Annelise Nguyen, PhD, MBA, DABT, ATS, SMNAI
Associate Dean for Research and Graduate Programs
Professor of Toxicology, School of Veterinary Medicine, Texas Tech University

Dr. Annelise Nguyen currently serves as associate dean for research and professor of toxicology at Texas Tech University's School of Veterinary with board certification by the American Board of Toxicology. She received a Bachelor of Science in Molecular and Cellular Biology and a PhD in Toxicology from Texas A&M University. She completed a postdoctoral fellowship at the National Eye Institute. Dr. Nguyen joined the Toxicology group at Kansas State University, College of Veterinary Medicine, where her research interests continued in the field of cancer biology, focusing on the role of gap junctional intercellular communication (GJIC). Her work extended to the field of spheroid/organoid development, utilizing the new technology of PGMatrix to recapitulate 3D human tumor-like spheroids. She joined Texas Tech University in 2020 with the effort to establish comparative models such as canine mammary cancer and feline kidney cancer. She is an inventor of US patents, entitled "Compounds affecting gap junction activity" and "Peptide-albumin hydrogel properties and its applications." She obtained over $3.5 million in sponsored research activities from federal agencies as well as private sectors. She was the recipient of 2009 K-INBRE-Kansas Technology Enterprise Corporation Scholar, 2011 University Distinguished Faculty Award for the Mentoring Undergraduate Students in Research, 2012 Kansas State University Women of Distinction, 2017 Inspiring Leader in STEM Award of the INSIGHT Into Diversity, 2019 John Doull Award for distinguished contribution to the field of toxicology, the Class of 2021 of the Academy of Toxicological Science, and 2024 Senior Member of the National Academy of Inventors. She teaches graduate and veterinary classes, including Veterinary Toxicology, Environmental Toxicology, Environmental Health, Ecotoxicology, and Cancer Pathogenesis.

ORAL PRESENTATION ABSTRACTS

10th Annual Meeting

Fatty Liver Disease - From NAFLD to MASLD: New Name, Same Challenges from Basic to Community Science

In-person Judging on Wednesday, May 7, 2025, from 3:00 PM to 4:00 PM

UNDERGRADUATE STUDENT

Poster 01

Investigating the Effects of Ammoniated Dietary Protein on Reducing Gluconeogenesis by Upregulating ALT

Paola Guzman, Lauren Gollahon
Department of Biological Sciences, Texas Tech University, Lubbock, TX.

Obesity plays a critical role in metabolic-associated chronic diseases such as cancer and fatty liver disease. One promising avenue of exploration involves the alanine-pyruvate pathway and its interaction with ammonium supplemented dietary proteins. Elevated ALT levels increase conversion of pyruvate into alanine, which is then cleared in the urea cycle. This is important because the enhanced clearance of ammonia via the urea cycle may reduce the toxic effects of excess nitrogen and improve overall metabolic balance. In this study, we hypothesize that modifying dietary protein by supplementing with ammonium hydroxide will attenuate metabolism-associated liver dysfunction by increasing the activity of alanine aminotransferase (ALT), which converts free ammonia and pyruvate into alanine and subsequent processing through the urea cycle. Ultimately, this shift in metabolic pathways could mitigate the effects of metabolic-associated chronic diseases by reducing nitrogen toxicity, limiting gluconeogenesis, and improving overall metabolic efficiency. To test this hypothesis, 3 male mouse liver tissue samples from control and ammonium supplemented high-fat dietary conditions were collected at 6, 12, and 18 months and analyzed by hematoxylin and eosin (H&E) staining for morphological changes. Additionally, Alt expression will be evaluated by immunohistochemistry (IHC) staining to analyze ALT expression. These analyses will provide insights into the structural and functional effects of ammonium supplemented diets on liver metabolism. Future studies will explore the broader implications of “Food as Medicine”, in which dietary manipulation of protein components with ammonium supplementation, may provide a novel, adjunctive approach to cancer prevention and treatment by reprogramming metabolic pathways to favor nitrogen clearance and limit glucose availability.

Poster 02

Wnt Signaling and Immune Regulation in Sertoli Cells

Elizabeth L. Jeffery, Rachel L. Babcock, and Jannette M. Dufour
Department of Cell Biology and Biochemistry, Texas Tech University Health Sciences Center, Lubbock, TX.

The Wnt signaling pathway mediates various cellular processes, including immune regulation. Sertoli cells (SC) are somatic cells located within the testis that are critical to facilitate spermatogenesis through their immune-modulating functions. However, the exact mechanisms involved in conferring immune-privilege properties to SCs remain largely unknown. This is important as obesity in males has been linked to increased amounts of inflammation, decreased testosterone levels, and reduced sperm motility and quality. Male infertility constitutes 20-50% of couple infertility cases, where a portion of individuals have testicular immune dysregulation. To examine new mechanisms regulating SC immune privilege properties, this preliminary study investigates the presence of Wnt-related immune genes in SCs, and whether their expression changes in response to complement, important immune signaling factors. Mouse SC transcriptome data was obtained using the Mouse Expression 430 2.0 microarray containing 45,101 total probes. Microarray data identified Wnt-related genes expressed by primary SCs and the mouse Sertoli cell line (MSC-1). Gene expression was confirmed by qPCR using primary SC mRNA ± complement isolated from male pigs, aged 3-5 days. Analysis of microarray data identified four Wnt-related genes that have immunomodulatory potential. Gene expression of Lef, Wnt4, Ppp2ca, and Nfatc1 was confirmed in NPSCs, and we further observed maintenance of Wnt gene expression following complement exposure, suggesting sustained expression of these genes may be important for mediating SC immune privilege properties. Future studies will analyze changes in Wnt-related gene expression in SCs following long-term complement exposure or inflammatory stimuli (i.e. lipopolysaccharide).

Poster 03

The Impact of Disordered Eating on Pain and Sleep in Persons With Overweight and Obesity
Dylan Jenkins, Tyler Livingston, Caroline Cummings
Department of Psychological Sciences, Texas Tech University, Lubbock, TX.

Objective: Persons with overweight and obesity are at an increased risk for comorbidities, including somatic (pain) and sleep disorders. Yet, little attention has been paid to the modifiable factors that distinguish problems in these related areas of functioning. The purpose of the study was to examine whether disordered eating behaviors distinguished comorbid concerns with pain and sleep among persons with overweight/obesity.
Methods: Emerging adults (N=43, ages 18-25) completed questionnaires pertaining to their disordered eating behavior, pain, pain interference, and sleep disturbance and related impairment. T-tests were used to analyze possible differences in pain and sleep indices based on disordered eating levels (i.e., likely eating disorder vs eating disorder unlikely).
Results: Participants who reported behaviors indicative of a possible eating disorder reported significantly greater pain severity ($p = .004$) and sleep-related impairment ($p < .001$), and marginally higher pain interference ($p = .060$), when compared to their counterparts. There were no differences in sleep disturbances ($p > .05$).
Significance: Findings are consistent with prior literature showing overlap with overweight and obesity and other significant health concerns. These findings suggest disordered eating behaviors in this health population might be a key factor in distinguishing risk for comorbidities.
Conclusions: Future research should develop and test universal interventions that target simultaneous concerns across multiple health indices to improve health outcomes and reduce patient burden. Particularly, addressing disordered eating within this health population might serve as a mechanism of reducing risk for other health conditions, such as those stemming from pain and sleep problems.

GRADUATE STUDENT

Poster 04

Integrating Patient Genomics and Wound Microbiomes Into a Structural Equation Model for Healing Time
Jacob Ancira, Khalid Omeir, Rebecca Gabrilska, Craig Tipton, Joseph Wolcott, Todd Little, Caleb D. Philips
Department of Biological Sciences, Texas Tech University, Lubbock, TX; RTL Genomics, MicroGenDx, Lubbock, Texas, TX; Department of Surgery, Texas Tech University Health Sciences Center, Lubbock, TX; Southwest Regional Wound Care Center, Lubbock, TX; Department of Educational Psychology and Leadership, Texas Tech University, Lubbock, TX; Natural Science Research Laboratory, Texas Tech University, Lubbock, TX.

Objective: The goal of the current work was to improve on our previously published structural equation model (SEM) to predict chronic wound healing with the addition of patient genomic markers.
Methods: The study was based on 127 chronic wound patients whose wound microbiomes were characterized at initial visit using 16S sequencing, and their genome was characterized at 6.2 million single nucleotide polymorphisms (SNPs) using genotyping arrays and imputation. Human genomic regions influential to healing differences were identified through a novel sliding window approach, and identified regions were modeled as latent variables. These genomic latent variables, a wound microbiome latent variable, and various patient/wound data were evaluated within the SEM.
Results: The final SEM model included four genomic regions and explained 71% of variation in healing time with the microbiome contributing the largest proportion of variance explained. None of the genomic latent variables were significant on their own, but their significant covariance with microbiome and wound variables increased explanatory power by 15%. The covariance suggests genomic influence on healing via microbiome.
Significance: The presented modeling strategy provides a multi-omics predictive framework. We successfully leveraged wound microbiome, patient genetic markers, and clinical characteristics to model healing time.
Conclusions: This model is flexible to the integration of other data types, such as gene expression and blood biomarker data. Future work will benchmark our genomic latent variable approach against other GWAS-related methods. Important for clinical adoption, the model's predictive utility will also be evaluated with independent cohorts.

Poster 05

Alternative Sintering Strategies for 3D-Printed Wearable Physiological Sensors

Naimul Arefin, Gray Podolak, Hur-E-Jannat Moni, Minxiang Zeng*
Department of Chemical Engineering, Texas Tech University, Lubbock, TX.

Objective: Since the global restrictions and lockdowns imposed during the COVID-19 pandemic, the demand for wearable and flexible devices capable of real-time metabolic and physiological monitoring has gained significant attention in the healthcare sector. Wearable sensors can effectively relay physiological information, eliminating the need for trained professionals or costly equipment. However, the current fabrication techniques are often limited due to the poor processibility of bulky materials and the requirement of energy-intensive post-processing steps, resulting in reduced sensitivity. Recently, additive manufacturing (AM) has emerged as a promising approach for fabricating next-generation wearable sensors, avoiding complex manufacturing steps. In the current study, we report a low-cost and room-temperature chemical sintering method for 3D-printed wearable sensors. In particular, we investigated the effects of four sintering methods on printed sensors, identifying the potential of chemical sintering for printed strain sensors.
Methods: The feasibility and efficacy of CH3COOH (AcOH), ammonia (NH3), and HCl as chemical sintering agents were assessed by evaluating the electrical properties of a 3D printed wearable sensor. As proof of concept, the potential for chemical sintering in wearable, flexible devices was analyzed by printing the pattern on a soft paper substrate. These flexible strain sensors demonstrated their capability to measure strain across a wide range of bending radii, indicating the feasibility of chemical sintering for processing printed wearable sensors in healthcare-related applications.
Results: The results showed that the sensors sintered with HCl had superior electrical properties compared to AcOH and NH3. This is due to the fact that halide-based compounds can facilitate the desorption of polymer/binder layers and promote Ostwald ripening, a process in which smaller particles are merged into larger particles, thereby improving the material's electrical characteristics. Additionally, the energy consumption during chemical sintering is lower compared to other conventional techniques, such as thermal sintering.
Significance: The outcomes from the current study can be a guiding framework to develop energy-efficient and high-performance wearable sensors for monitoring real-time metabolic and physiological information from the human body.

Poster 06

Exploring the Role of Neprilysin-Like 15 (Nepl15) in Metabolic Regulation and Energy Homeostasis in Drosophila

Shahira Helal Arzoo, Chase Drucker, Surya Jyoti Banerjee
Department of Biological Sciences, Texas Tech University, Lubbock, TX.

Objective: Neprilysin, a zinc-dependent metalloendopeptidase, plays a crucial role in metabolism by regulating insulin signaling, lipid storage, and energy balance. While well-studied in mammals, its function in Drosophila melanogaster remains largely unexplored. Nepl15, a catalytically inactive neprilysin-like protein, is highly expressed in the fat body and exhibits sex-specific metabolic effects, male knockout (KO) flies exhibited reduced glycogen and glycerolipid storage, whereas females showed increased glycogen accumulation. The current study investigates the role of Nepl15 in lipid and carbohydrate metabolism, mitochondrial function, oxidative stress, locomotor performance, and lifespan, with implications for obesity and type 2 diabetes (T2D).
Methods: Nepl15 knockout (KO) flies were previously generated using CRISPR-Cas9, and metabolic phenotypes were assessed through biochemical assays, gene expression analysis (qPCR), western blot, metabolomics and lipidomics. Climbing ability was evaluated using negative geotaxis assays, and lifespan was measured under standard conditions.
Results: Key metabolic enzymes (GlyS, GlyP, Lipin, Brummer, Midway, ACC, and Fasn1/2) displayed differential expression. Females exhibited significantly lower ROS levels, while males showed increased mitochondrial membrane potential. Insulin signaling was impaired in both sexes, as indicated by reduced phosphorylation of AKT (pAKT). KO flies demonstrated enhanced climbing ability with age, and females exhibited a significantly increased lifespan, whereas males showed no change.
Significance & Conclusion: These findings establish Nepl15 as a key regulator of metabolism, aging, and locomotion in Drosophila, with potential relevance to human metabolic disorders. The conservation of neprilysin pathways highlights Nepl15 as a novel target for therapeutic intervention in obesity and T2D.

Poster 07

Maternal Pea Fiber Supplementation Improves Energy Balance, Glycemic Control and Cardiac Function in Spontaneously Hypertensive Stroke-Prone Rats and Their Offspring

Md Tareq Aziz, Daniela Redrovan, Souvik Patra, Michael Cruz Penn and Prasanth K Chelikani
School of Veterinary Medicine, Texas Tech University, Amarillo. Texas Tech University, Lubbock, TX.

Background: Previous rodent studies showed that maternal diets high in inulin fiber protect the offspring against obesity. However, the specific effects of maternal pea fiber on energy balance and cardiovascular health remain underexplored. We determined the effect of maternal pea fiber (PF) supplementation on energy balance, body composition, glucose clearance, and indices of cardiac function, in dams and offsprings of Spontaneously Hypertensive Stroke-Prone (SHRSP) rats.
Methods: Female SHRSP rats (n=44, 8-10 weeks old) were fed a high-fat-diet (4.76 kcal/g) for 3-weeks, bred, and randomized to: Control (C), Pea Fiber (PF, 25% wt/wt, during gestation and lactation, control diet postweaning) and Control+Pea Fiber (C+PF, pea fiber during lactation and postweaning). Food intake, energy expenditure (EE), respiratory quotient (RQ), body composition, glucose tolerance, and echocardiography were assessed.
Results: Maternal: Compared to C, the PF reduced RQ and EE during gestation and lactation, and reduced fat mass in lactation. C+PF increased lean mass and enhanced blood glucose clearance in lactation. Offspring: PF-offspring showed reduced RQ, C+PF male offspring had reduced RQ and fat mass, and female offspring had reduced weight and fat mass. PF and C+PF offspring had higher ejection fraction rates and stroke volumes at weaning.
Conclusion: Maternal supplementation of pea fiber increased fat utilization, reduced adiposity, and improved glycemic control in dams, and part of these benefits were imprinted on their offspring. Postnatal pea fiber supplementation reduced adiposity and improved cardiac function in adulthood.

Poster 08

Ammonium Hydroxide Modification of Dietary Protein Source Beneficially Modulates Liver Proteins and Kreb Cycle Metabolites in a Sex- and Aging-Dependent Manner

Benjamin Barr, Indhumathy Subramaniyan, Li Li, Danielle E. Levitt, and Lauren Gollahon
Department of Biological Sciences, Texas Tech University, Lubbock, TX.

Objective: Impact of dietary protein source (DPS) as a dietary intervention to improve metabolic health is under-explored. Additionally, few studies have investigated the effects of modifying DPS to address metabolic health. The current study aims to determine whether different DPS and their modification by ammonium hydroxide enhancement (AHE) affects the development of metabolic dysfunction-associated steatotic liver disease (MASLD) in a long-term study of diet-induced obese mice.
Methods: Four-week-old female and male C3H/HeJ mice were divided into high-fat casein (HFC) and high-fat beef (HFB) ± AHE (HFCN and HFBN) and fed these diets for 18-months. Livers samples were collected every six months (n ≈ 8 per group) for RNA, protein and metabolite analysis by immunoblotting and LC-MS, respectively. RNA-seq was performed at 18-months.
Results: Qiagen Ingenuity Pathways Analysis (IPA) revealed activation of key canonical pathways (i.e., Regulation of Lipid Metabolism by PPARα) in the HFBN diets compared to HFB diets at 18-months for both sexes. In males, glutamine synthetase increased in the HFBN diet compared with all other diets at 12- and 18-months, while glucose in the HFBN diet significantly decreased at 12- and 18-months. In females, CYP3A4 increased in the HFBN diet at 12- and 18-months, while levels of glutamine decreased at 18-months in the HFCN diet.
Conclusion: These findings indicate that in the context of MASLD, AHE in a high-fat diet alters liver function in a sexually dimorphic manner. More study is needed to better understand how AHE and DPS alter liver function and metabolism in the different sexes.

Poster 09

Plasma Water T2 is Associated with Exercise Duration in Females with Excess Body Weight

Diana F. Combs[1], Hushyar Azari[1], Diana F. Sandoval[2], David P. Cistola[2,3], Kembra Albracht-Schulte[1]
[1]Department of Kinesiology & Sports Management, Texas Tech University, Lubbock, TX. [1]Center of Excellence in Obesity and Cardiometabolic Research, Texas Tech University, Lubbock, TX, [2]CoE in Diabetes & Metabolism, Texas Tech University Health Sciences Center El Paso, [3]T2YourHealth, LLC, El Paso, TX

Plasma water T2, an indicator of metabolism-driven changes in the rotational/translational diffusion of water, has been suggested as a practical biomarker for the early detection of poor metabolic health. Water T2 detects early insulin resistance in individuals with normal blood glucose, triglycerides, hemoglobin A1C, and high-density lipoprotein. However, the relationship of T2 with cardiorespiratory fitness is unknown.
Purpose: The objective of this research is to quantify the association between water T2 levels and cardiorespiratory fitness in untrained adults with overweight or obesity.
Methods: This observational cross-sectional study utilizes baseline samples from a clinical trial (ID: NCT05295719). Participants completed a modified Bruce cardiopulmonary exercise test (CPET) on a cycle ergometer. Anthropometric data and fasted blood samples were collected to assess metabolic and inflammatory markers, and water T2. A preliminary analysis was conducted with a machine-learning predictor screening of CPET variables with plasma water T2 as the outcome, followed by a multivariable linear regression analysis with exercise duration as the outcome and plasma T2 as the primary exposure.
Results: Preliminary data from twenty females (age 32 ± 14 years, BMI 33 ± 4 kg/m2), and twelve males (age 35 ± 12.4 years, BMI 31.6 ± 4.6 kg/m2) were analyzed. Multi-variable linear regression, when stratified by sex, revealed plasma T2 as a significant predictor of exercise duration in females (p=0.0273), but not in males (p=0.9773).
Conclusion: The association between T2 and exercise duration is influenced by sex, with plasma water T2 serving as a predictor of exercise duration during VO2max testing in females.

Poster 10

Effects of Diets Containing High Fat and Ammoniated Beef on Gut Microbiota Composition

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Diets high in calories, fat and sodium, with limited fruits and vegetables, are often acidic and may contribute to metabolic dysfunctions, including acidosis. We previously reported metabolic improvements in mice fed pH-enhanced beef or casein diets (via ammonium hydroxide, N), yet underlying mechanisms remain unclear. We hypothesized that modeling of gut microbiota by ammoniated diets is partly responsible for observed protective effects. Male and female B6 mice were fed one of four diets for 12 weeks: Low fat beef (LFB), LFB + N (LFBN), High Fat Beef (HFB), or HFB + N (HFBN). Fecal and tissue samples were collected, and gut microbiota analyses were completed via fecal 16S rRNA sequencing. Analyses of 16S sequencing revealed alpha diversity decreased in HFBN group compared to LFBN (P=0.02) for females, with no changes in males. Principal coordinate analysis (PCoA) of beta diversity revealed no clear patterns for females. In males, clustering was based on dietary fat content, not ammoniation. Females exhibited an increase in the relative abundance of Bacteroidaceae in HF, compared to the LF group (P=0.0044), with no change in males. In both females (P=0.047) and males (P=0.0012), relative abundance of Muribaculaceae decreased in the HF compared to LF group. Our results demonstrate that while ammoniation led to metabolic improvements, dietary fat content primarily modulates gut microbiota composition. Ongoing analyses will determine whether changes in microbiota composition are associated with altered markers of gut integrity. Further research is warranted to explore mechanisms connecting dietary fat, food processing, gut microbiota, and metabolic health.

Poster 11

Addressing Diabetes Early: Integrating Comprehensive Education Across Preclinical Organ Systems

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Background: With diabetes mellitus (DM) affecting the majority of organ systems, it is essential for medical education to address DM-associated complications comprehensively. At Texas Tech University Health Sciences Center School of Medicine, the two-year preclerkship curriculum includes two foundational blocks and five organ system (OS) blocks. Endocrinology, covering most DM-related instruction, is taught in OS5 block at the end of the second year, limiting integration of diabetes' systemic effects across OS blocks.
Objective: This study investigates the impact of integrating diabetes-focused resources across all OS blocks on students' understanding and retention of diabetes-related concepts. We hypothesize that these resources will enhance students' confidence in their comprehension of diabetic endocrinology and its effect on various OS.
Methods: Tailored diabetes resources including a high-yield fact sheet and a case study, were developed and provided to students during each OS block. A qualitative survey was conducted to assess students' confidence in applying their knowledge of diabetes and its organ-specific effects.
Results: Results showed an increase in student confidence during the OS5 block, with 50% (n=38) reporting improved comprehension compared to 14% in earlier blocks (n=16-19). Additionally, 66% of OS5 students indicated a preference for earlier diabetes education, and 76% believed it would have positively impacted their academic performance.
Conclusion: Initial findings suggest that a longitudinal approach to diabetes education enhances students' understanding of the disease and its systemic effects. By embedding diabetes content throughout the preclinical curriculum, institutions can better prepare future physicians to manage this multifaceted disease.

Poster 12

In Vitro Pharmacokinetic and Intracellular pH Modulation Analyses of Chlorogenic Acid and Cinnamaldehyde to Inform In Vivo Studies in a Mouse Xenograft Model of Breast Cancer

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Determining pharmacodynamics and analyzing pharmacokinetic profiles of promising therapeutic agents is central to drug development and discovery efforts. It is important for next steps in the bench-to-bedside process. This study examined the pharmacokinetics of two phytochemicals, chlorogenic acid (CGA) and cinnamaldehyde (CA), alone and in combination (CGA:CA) in modulating intracellular pH of breast cancer cells, MDA-MB-231 and MCF-7. Phytochemical pH stability was determined by LCMS at pH 1.2, 7.4, and 9.0, at 37OC, to mimic the variable pH in the human gastrointestinal tract. First pass metabolism of the compounds was assessed by LCMS using human liver microsomes (HLM), containing isoforms of cytochrome P 450 (CYPs) and xenobiotic metabolizing phase II enzymes, and NADPH. Phytochemical rate and quantity of cellular uptake was also measured by LCMS. Alkaline intracellular pH modulation due to CGA:CA was analyzed by ratio-metric fluorescence measurement of SNARF-1. The phytochemicals were completely and partially stable at physiological pH of 7.4 and 1.2 respectively, with complete instability at pH 9.0. Interestingly, they were not substrates of CYPs. They were transported, predictably by solute carrier proteins (SLCs), into the cells against the concentration gradient until equilibrium is reached, after which absorption plummeted. CGA:CA drives acidification of intracellular breast cancer cell pH without impacting non-cancerous MCF10A cells, altering the reversed pH gradient in cancer cells. The study results on combinatorial CGA:CA demonstrates good pharmacokinetic properties, strengthening their potential as promising anticancer agents, and inform subsequent in vivo studies in a mouse xenograft model for breast cancer.

Poster 13

Heritable Tissue-specific Gene Expression Associates With Chronic Wound Microbial Species

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Objective: The reasons for interpatient variability in chronic wound microbiome composition are thought to be complex but are poorly known. To investigate how patients' genetically regulated tissue expression may influence chronic wound bacterial composition, we performed a microbiome-transcriptome-wide association study.
Methods: This approach involved estimating for 509 patients their tissue-specific gene expression from DNA genotypes, followed by associating gene expression to the relative abundances of species detected in their wounds as provided on clinical reports to the physician.
Results: Comparisons to artery, blood, fibroblast, skeletal muscle, skin, subcutaneous fat, and nerve tissue resulted in 251 transcriptional differences at 109 genes significantly explaining abundances of 39 different species. Overall, these species were detected in ~63% of wounds. A similar number of associations per tissue was observed (range 31-39), and many genes were associated at multiple tissues in distinct ways. The cumulative variance across loci for species relative abundance explained ranged from ~3-36%, depending on species. Although the same gene was almost never associated with more than one species, ~14% of enriched pathways were independently enriched for multiple species, which may reflect the diversity of ways microbes interact with partially overlapping attributes of the wound bed. Commonly enriched pathways pertained to collagen formation and modification, cell signaling, cytoskeletal dynamics, interactions with extracellular matrix, transmembrane proteins, among others. This work expands the new perspective that individual genetics may partially determine microbial colonization and infection.

Poster 14

Investigating Changes in Mitochondrial Dynamics in PLA2G6-associated Neurodegeneration in Drosophila

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Objective: Neurodegenerative diseases (NDs) are a major health burden with poorly understood mechanisms. Mutations in PLA2G6 and its Drosophila ortholog iPLA2-VIA cause PLA2G6-associated neurodegeneration (PLAN), marked by locomotor deficits, reduced lifespan, and mitochondrial dysfunction. iPLA2-VIA encodes a calcium-independent phospholipase A2, essential for lipid remodeling. iPLA2-VIA LoF mutants exhibit age-dependent motor decline and mitochondrial defects in the brain, thorax, and ovary. Metabolic and lipid shifts suggest accelerated aging and female-specific fertility defects. Additionally, we observed a clumpy appearance of mitochondria in the nurse cells of ovaries laid by 21 days and older iPLA2-VIA LoF mutants, suggesting changes in mitochondrial dynamics like fission and fusion. Thus, it is essential to dissect the changes in mitochondrial dynamics to understand the mechanism of PLAN.
Methods: Mitochondrial dynamics were analyzed via RT-qPCR of key mitochondrial fission (Drp1) and fusion regulators (Mfn1, Mfn2) in 7- and 21-day-old iPLA2-VIA LoF and Isogenic control flies. We plan to extend this to catalytically dead iPLA2-VIA mutants, which rescue motor defects, to uncover how iPLA2-VIA preserves mitochondrial integrity and neuroprotection.
Results: RT-qPCR analysis revealed increased expression of the Drp1 gene in 7-day old mutant females and reduced expression of the Mfn2 levels in 21-day old mutants, indicating dysregulated mitochondrial fission-fusion. No significant changes were observed in males. Our findings highlight iPLA2-VIA's role in mitochondrial dynamics and neuroprotection. Its dysfunction contributes to neurodegeneration, especially in females. Future work will identify protein interactors of iPLA2-VIA and key domains involved in mitochondrial regulation.

Poster 15

The Effect of the e-Culinary Medicine Utilizing the PCOS Diet on Patient Empowerment for Disease Management and Health Quality of Life of Women with PCOS

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Objective: Polycystic Ovary Syndrome (PCOS) affects physical, mental, and social well-being. While dietary interventions can improve symptoms, limited research has explored patient education and self-management. This study evaluated an e-Culinary Medicine platform integrating the PCOS diet to enhance empowerment, disease management, and quality of life.
Methods: A single-blind randomized controlled trial was conducted with 15 participants (ages 18-45) from Texas Tech University and a reproductive endocrinology clinic. Participants received either static or video-based media with 16 recipes and eight educational modules over eight weeks. Data were collected using validated questionnaires, including the CDC's Healthy Days Quality of Life Questionnaire, Long-Term Empowerment Questionnaire, PCOS Questionnaire (PCOSQ), Bowel Disease Questionnaire, and Migraine Screening Questionnaire. Anthropometric measurements, dietary adherence, and participant-reported outcomes were assessed.
Results: No statistically significant differences were found in empowerment, quality of life, or symptom management between groups. The small sample size, geographic restriction, and short duration likely impacted statistical power and generalizability.
Significance: This study highlights the feasibility of e-Culinary Medicine as a dietary education tool for PCOS. Although no significant effects were observed, digital interventions remain promising for accessible patient education.
Conclusions: The e-Culinary Medicine intervention showed no significant effects on empowerment or quality of life in women with PCOS. Future research should involve larger, more diverse populations and longer-term interventions to assess the sustained impact of e-Culinary Medicine on PCOS management.

Poster 16

Metabolic Reprogramming in Alzheimer's Disease: Sex Differences in Hypothalamic Glucose and Energy Metabolism

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Alzheimer's disease (AD) is a type of dementia that disproportionately affects women and is marked by significant metabolic impairments, particularly in glucose metabolism. While much of the research has focused on the cerebral cortex, there is a growing need to explore other brain regions such as the hypothalamus, which plays a critical role in regulating energy balance and metabolism. This study investigates sex-specific differences in hypothalamic glucose metabolism in an AD-like condition. Using male and female hypothalamic neurons derived from adult mice, we examined the effects of oligomerized amyloid beta (Aβ) on glucose metabolism. Aβ is a key pathological feature that induces neurotoxic stress, potentially contributing to the metabolic impairments observed in the disease. Through gene and protein expression analyses, enzymatic assays, and functional metabolic assays, we compared the metabolic responses of male and female cells exposed to Aβ. Our results reveal striking sex differences in metabolic pathways. In males, Aβ treatment reduces hexokinase activity, impairing glycolysis, leading to a possible pyruvate buildup and a higher reliance on oxidative phosphorylation for energy production. In contrast, females show a shift toward glycolysis. Interestingly, Aβ-treated female cells show a reduced ability to utilize glucose for oxidative metabolism and a potential shift toward utilizing other fuels for mitochondrial respiration. Like obesity and metabolic syndrome, AD may involve sex-specific metabolic adaptations. Males rely more on oxidative metabolism due to impaired glycolysis, while females enhance glycolysis and shift to alternative pathways in response to Aβ toxicity.

Poster # 17

Sertoli Cell Regulation of the Complement System and its Potential Applications in Diabetes Mellitus

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Diabetes Mellitus (DM) is a metabolic disease characterized by impaired production of insulin (Type 1 DM) or insulin resistance (Type 2 DM). The resulting hyperglycemia promotes a pro-inflammatory environment associated with increased complement circulation. The complement system protects the body from pathogens by activating inflammatory processes, opsonizing pathogens, and lysing target cells. Complement dysregulation due to DM leads to complement-mediated chronic inflammation and DM microvasculature complications. As Sertoli cells (SCs) evade complement-mediated destruction, the goal of this study is to determine the mechanism(s) by which SCs regulate complement and create an immune-protective environment. Using an in vitro model of complement activation, we confirmed the survival of neonatal pig SCs (NPSCs) and killing of pig aortic endothelial cells (PAECs) after 1.5 and 15 hours of exposure to normal human serum (NHS, containing antibodies and complement). We found that NPSCs express twenty-one complement regulatory genes that regulate all major parts of the complement cascade, nineteen of which were upregulated in NPSCs when compared to the gene expression by PAECs. We found PAECs had increased survival after 1.5-hour incubation with NHS when cultured in SC conditioned media (SCCM) compared to PAEC cultured without SCCM, and NPSCs have significantly elevated expression of seven secreted complement inhibitors compared to PAECs. We found no differences in the levels of complement factors C3 and C3a in serum from patients with T1DM, T2DM, and no DM. Determining mechanisms by which SCs regulate complement could identify novel ways to minimize complications associated with the pro-inflammatory environment caused by DM.

Poster 18

Effects of High Fat Diet on Gut Microbiota in Diet-Induced (C57BL/6J) and Genetically (TALLYHO/Jng) Obese Mice

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Obesity is a chronic disease that elevates the risk of metabolic comorbidities. Adipose tissue remodeling contributes to chronic inflammation in obesity. Gut dysbiosis disrupted intestinal barrier integrity, and elevated bacterial lipopolysaccharide levels are all hallmarks of obesity-related disorders. Previously we showed that high fat (HF) diet significantly increased plasma IL-6 levels in TALLYHO/Jng (TH) polygenic female mice compared to low-fat (LF) diet. We hypothesized that HF diet adversely alters gut microbiota composition, and markers of intestinal barrier integrity, and exacerbates inflammation in both diet-induced (B6) and polygenic TH obese mice. Male and female B6 and TH mice were fed LF or HF diets for 14 weeks. We used collected cecal and colon tissue samples for 16S rRNA sequencing to evaluate changes in gut bacteria composition, and colon tissue to measure changes in markers of intestinal barrier integrity using qRT-PCR. In B6 mice, HF diet significantly reduced the abundance of Bacteroidaceae in males ($p = 0.03$) and females ($p = 0.047$), compared to the LF group, at the family level. Similarly, in TH mice, the HF diet significantly decreased the number of Lactobacillaceae in males ($p = 0.037$) and females ($p = 0.007$). In B6 and TH female mice, HF diet significantly reduced the mRNA expression level of Ocln, (B6: $p = 0.04$; TH: $p = 0.02$) and Zo1 (TH: $p = 0.0009$, B6: $p = 0.04$), with no significant changes in males, consistent with previously reported Il-6 levels. HF diet remodeled gut microbiota and altered markers of intestinal barrier integrity, particularly in females. These findings highlight strain and sex-specific responses to HF diets in obesity.

Poster 19

Combined Effects of Fish Oil and High-Intensity Interval Training on Body Composition in Individuals Classified as Overweight: Preliminary Results

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Objectives: High-intensity interval training (HIIT) is a time-efficient exercise that improves body weight and composition. Fish oil, rich in long chain omega-3 polyunsaturated fatty acids (n-3 PUFAs), has potent anti-inflammatory and triglyceride-lowering properties; however, the impact of n-3 PUFA supplementation on body weight and composition is controversial in humans. We hypothesized that the addition of n-3 PUFAs will enhance improvements in body composition with a shorter (4 weeks) HIIT program.
Methods: This clinical trial (ID: NCT05295719), participants with overweight/obesity (n=47) were randomly assigned to four groups: (1) placebo (safflower oil) + low-intensity training (LIT), (2) n-3 PUFA (4 grams/day) + LIT, (3) placebo + HIIT, and (4) n-3 PUFA + HIIT. Anthropometric data and dual x-ray absorptiometry (DXA) scans, used to differentiate lean mass and fat mass, were performed at baseline and following the 8-week intervention.
Results: The baseline characteristics were similar across the four groups. The linear mixed-effects model revealed significant negative effects for hip circumference in the placebo + HIIT group after 4 weeks ($\beta = -6.54$, $p = 0.033$). A trend toward a positive effect on BMI was observed in the n-3 PUFA + HIIT group ($\beta = 1.21$, $p = 0.098$). No significant interactions were observed with other body composition parameters.
Conclusions: Preliminary findings indicate a potential benefit of short-term HIIT on body fat distribution, with a slight reduction in hip circumference following 4 weeks of HIIT. The addition of n-3 PUFA with HIIT trending towards improvement in body weight warrants further investigation.

Poster 20

Aerobic Exercise Alters Gastrointestinal Microbiota in HET3 Mice

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Aging alters gut microbiota composition by reducing biodiversity, which impairs metabolic health. Aerobic exercise combats aging, possibly by increasing gut microbiota biodiversity.
Purpose: We aimed to characterize aerobic exercise training (ET)-induced changes in the gut microbiome of a heterozygous aging mouse model (HET3) and determine the relationship between bacterial changes and changes (pre/post) in body composition (body weight, lean and fat mass) and exercise capacity (total work (Joules), distance, and duration).
Methods: HET3 male mice were randomly assigned to a sedentary (SED, N=16) control group or ET (N=17) group that trained 5 days/week for 4 weeks at 65% of max work output. Body composition and exercise capacity were assessed pre- and post-ET. Fecal samples were collected post-ET. 16s sequencing was performed on a subset of mice (SED, N=13; ET, N=13). Using QIIME2, the taxonomy of each amplicon sequence variant (ASV) was assigned using the classifier generated from the Silva 138.116S rRNA bacteria database. Alpha and beta diversity analyses were performed in R. Spearman's correlation analysis was used to examine the relationships between the aggregated phylum-level relative abundances and the changes in body composition and exercise capacity.
Results: ET mice exhibit a broader range of alpha diversity with a higher (219.5) median richness than SED mice (range: 202.8 to 203.2), as indicated by the Chao1 and observed species richness indices, although no significant difference was revealed between the two groups. Beta diversity analysis using PCoA reveals a significant ($P = 0.01$) separation between the two groups, indicating distinct microbial community compositions. SED mice exhibited a higher abundance of the Firmicutes phyla, while Bacteroidota was higher in ET mice. The correlation analysis did not reveal any noteworthy associations between the aggregated phylum-level relative abundances and the absolute pre-post differences in body composition and exercise capacity indices.
Conclusions: Despite the heterogeneity of HET3 mice, our data suggests that ET leads to distinct gut microbiota changes, contributing to greater microbial diversity. Future work aims to identify the contribution of these changes to biological aging, as exercise ameliorates biological aging.

Poster 21

The Grain in Motion Program: A Sorghum-Based Intervention for Diabetes Prevention in Individuals with Overweight or Obesity. A Study Protocol

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Objective: To determine the impact of an innovative sorghum-based nutrition intervention for diabetes prevention in individuals with overweight or obesity on 1)insulin and glucose levels, 2) lipid profile, 3)anthropometrics and body composition 4)sorghum consumption, and 5)nutrition knowledge and self-efficacy.
Methods: Participants with overweight or obesity with a BMI >25, no food allergies, aged 18-44 years, taking no prescription will be included in this randomized control trial. Participants not meeting this criteria will be excluded. The 6-week theory-based program applied the Health Belief Model. The intervention group will receive 65g of cooked sorghum daily and nutrition education on wholegrain sorghum benefits and diabetes prevention. The control group will continue their usual diet, without sorghum. The intervention group will attend weekly 90 minutes in-person sessions, with 30-minute lecture and a 60-minute hands-on activity (e.g. cooking demonstration and sorghum tasting). Based on the needs assessment, educational content was developed including format and knowledge level. Knowledge and self-efficacy will be assessed using a validated questionnaire, while insulin, blood glucose and lipid profile will be measured via blood draw, and DXA scan for body composition. Anthropometrics measurements and a Food Frequency questionnaire for grains intake will be taken at baseline and postintervention. Descriptive statistics for anthropometrics and demographics and multiple linear regression will assess the intervention's effect between and within groups adjusting for other variables.
Results: N/A
Conclusion: We expect to expand knowledge on sorghum's metabolic effects in individuals with obesity or overweight while increasing nutrition knowledge, self-efficacy, and sorghum consumption for diabetes prevention.

Poster # 22

Adipose Tissue Neuro-like Cell Profile Changes with Ketosis in Dairy Cows

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Adipose tissue (AT) is innervated by the sympathetic nervous system and its activation is necessary for the release of energy, imbalance of which can lead to disease. We performed RNA sequencing to aid in the functional characterization of NLC in subcutaneous AT (SAT) of dairy cows with subclinical ketosis (SCK). Stromal vascular fraction (SVF) was isolated from flank SAT of multiparous Holstein cows with SCK or non-ketotic (NK). Using cell sorting NLC were isolated from the SVF by positive expression of nerve growth factor receptor and negative expression of the immune cell marker CD45 and the mesenchymal cell marker CD34. RNA-sequencing was performed on whole SVF and NLC. Differentially expressed genes were identified by DESeq2 package in R and upregulated DEG were analyzed in Enrichr. Independent of SCK, NLC had a similar profile to type IC spiral ganglion neurons identified by CellMarker 2024. Functional transcriptomics revealed an activation of the postsynaptic density pathway, thus ratifying NLC neural properties. In NK-NLC, expression of lipopolysaccharide binding protein, leukotriene biosynthesis genes GTT5 and GTTA1, neurotransmitter transporter SLC22A3, RELN, and voltage gated sodium channel, SCN9A were increased in NLC vs. SVF, suggesting a neuroimmune role for NLC in postpartum cows. SCK-NLC had increased lipoprotein receptor 2 and RGS4, a regulator of lipolysis through catecholamines, and decreased GLUT4 trafficking protein TRARG1 and glutamate metabotropic receptor 7, suggesting an adipogenic and neuroregulatory role of NLC in cows with SCK. Our findings show an impact of SCK on SAT via the modulation of NLC transcriptional profile.

Poster 23

Targeted Inhibition of Methionine Aminopeptidase 2: A Novel Strategy for Anti-Obesity Therapy

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Introduction: Obesity is a chronic metabolic disease with increasing prevalence rates worldwide. Though current weight loss drugs have demonstrated promising results in promoting weight loss, their long-term safety and efficacy remain uncertain, highlighting the need for new therapies. MetAP2 inhibitors, which regulate fat metabolism, show promise for obesity treatment by reducing fat accumulation, boosting energy expenditure, and improving insulin sensitivity. While preclinical studies suggest potential, further research is needed to confirm their benefits.
Objectives: Many existing MetAP2 inhibitors are non-specific, targeting both MetAP1 and MetAP2. In this study, we synthesized BT1201, a novel MetAP2-selective inhibitor and our aim is to assess its impact on adipogenesis and glucose metabolism. We hypothesize that MetAP2 inhibition will reduce fat accumulation while preserving glucose homeostasis.
Methods: Murine 3T3-L1 preadipocytes were differentiated by treating with differentiation media containing insulin, dexamethasone, and 3-isobutyl-1-methylxanthine (IBMX). After induction, cells were treated every 2 days for 6 days with varying concentrations of BT1201 (100 μM, 150 μM, 200 μM, or 0 μM as a control). Lipid accumulation was assessed in differentiated cells using Oil Red O staining, and adipogenic gene expression was analyzed from collected cell lysates.
Results: Results demonstrated a significant, dose-dependent inhibition of adipogenesis in cells treated with MetAP2 small molecule inhibitor, as indicated by reduced lipid content and altered gene expression.
Conclusion: These findings suggest that MetAP2 inhibition may serve as a promising strategy for obesity treatment. However, further research is required to evaluate the safety and efficacy of MetAP2 inhibitors in preclinical animal models.

Poster 24

Mitochondrial Defect is Likely to Correlate With Metabolic Shifts with age and sex-specific metabolomic shifts in PLA2G6-associated neurodegeneration

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Objective: PLA2G6-associated neurodegeneration (PLAN) is a rare disorder caused by mutations in the PLA2G6 gene, leading to progressive neurodegeneration. Drosophila melanogaster models with loss-of-function mutations in the iPLA2-VIA gene exhibit age-dependent locomotor defects, reduced lifespan, and female-specific fertility defects. Given that iPLA2-VIA localizes to mitochondria and its loss leads to mitochondrial aggregation and apoptosis in female germ cells, we hypothesized that systemic mitochondrial function and metabolic homeostasis are disrupted in iPLA2-VIA mutants. This study aims to investigate mitochondrial structural defects, functional impairments, and altered metabolic pathways in iPLA2-VIA mutant flies.
Methods: Metabolomic and lipidomic profiling of young (<1 week) and aged (1 month) iPLA2-VIA mutant and control flies was performed using mass spectrometry. Data analysis, including pathway enrichment and network analysis, was conducted using SIMCA, MetaboAnalyst 6.0, and Ingenuity Pathway Analysis (IPA) to identify metabolic pathway alterations. The mitochondrial structure of iPLA2-VIA mutant and control flies was evaluated by transmission electron microscopy (TEM) of the head, thorax, abdomen, and ovary at 7 days and 3 weeks old. To assess mitochondrial function, ATP assays were performed on ovarian tissues. Oxidative stress was assessed by measuring reactive oxygen species (ROS) levels. Metabolic and lipidomic changes due to the iPLA2-VIA loss-of-function mutation were identified using metabolomic and lipidomic profiling.
Result: TEM analysis revealed significant mitochondrial abnormalities in mutants, including disrupted cristae, damaged mitochondrial membrane, and elongated ovarian mitochondria. Young male mutants exhibited increased purine metabolism and CoA biosynthesis, while in young female, reduced lysine degradation and arginine metabolism pointed to disrupted protein turnover and cellular stress response. Upregulated glutamate degradation, GABA receptor activation, and glutamate-dependent acid resistance in aged males suggested altered neurotransmitter signaling and mitochondrial dysfunction. Aged female mutants showed increased CMA, STAT3, and Cdc42 activity, indicating enhanced mitochondrial dynamics and stress response. ATP levels were significantly reduced in mutant ovaries, while ROS levels were elevated. Metabolomic and lipidomic analysis further demonstrated significant metabolic and lipidomic alterations in mutant flies.

POSTDOCTORAL FELLOW

Poster 25

Splice it up: Nuclear Dishevelled 1 (DVL1) is a Mediator of mRNA Splicing in Triple Negative Breast Cancer

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Dishevelled 1 (DVL1) is a well-characterized cytoplasmic protein that regulates Wnt signaling, a pathway integral in various developmental processes and cancer. DVL1 is enriched in triple negative breast cancer (TNBC) and promotes TNBC tumor growth. TNBC is the most aggressive breast cancer subtype and is more prevalent and has worse prognosis in obese patients. Intriguingly, DVL1 is found in the nucleus. Despite DVL1's critical role in Wnt signaling, little is understood about its nuclear role. Using affinity purification followed by liquid chromatography and mass spectrometry, we identified novel binding factors of nuclear DVL1 across two TNBC cell lines (MDA-MB-231 and MDA-MB-468) and a non-cancerous mammary gland cell line (MCF10A). Pathway enrichment analyses on the ~2600 DVL1 binding factors suggests DVL1 affects mRNA processing/translation and splicing, a new and unexpected role for DVL1. Using RNA-sequencing in the MDA-MB-231 cell line, we confirmed overexpression of DVL1 globally modulates gene expression as well as the alternative splicing of over a thousand genes. Evaluating mechanisms by which DVL1 mediates splicing, we found DVL1 interacted with numerous splicing factors, including serine/arginine-rich splicing factor 1 (SRSF1), which was experimentally confirmed. Literature also indicates another major Wnt signaling factor, β-catenin, may regulate splicing. Future loss of function assays will validate whether DVL1 requires SRSF1 as well as β-catenin to mediate splicing of key genes. Collectively, we anticipate defining nuclear DVL1 as a novel regulator of mRNA splicing will strengthen our basic understanding of DVL1 and its potential as a therapeutic target in TNBC to improve women's health.

Poster 26

Gestational Diabetes and Depot Alter Adipocyte and Progenitor Cell Transcriptional Profile in Adipose Tissue of Women

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Gestational diabetes (GDM) is characterized by insulin resistance and increases the risk for perinatal complications, and type 2 diabetes. Adipose tissue (AT) regulates systemic glucose homeostasis, and its dysfunction leads to insulin resistance. We elucidated how GDM affects visceral (VAT) and subcutaneous AT (SAT) cellular diversity via single-nuclei RNA sequencing (snRNAseq). Paired abdominal SAT and omental VAT were collected during C-section from four women with GDM and four matching controls. GDM was diagnosed at the third trimester by a glucose tolerance test. SnRNAseq was performed using 10x Genomics/CellRanger pipelines, sequenced on an Illumina NovaSeq6000, and analyzed by Seurat package in R (v5.0). At collection, GDM patients had higher BMI, HbA1C, and insulinemia, but similar glycemia as Control. All major cell types were identified across 73,000 SAT and 169,000 VAT nuclei based on signature genes, including adipocytes (AD; ADIPOQ), adipose stromal/progenitor cells (ASPC; PDGFRA), endothelial cells (EC; PECAM1), pericyte/smooth muscle cells (NOTCH3), and immune cells (IMC; PTPRC). Among AD, three clusters were more abundant in SAT than VAT, including an AD cluster with high expression of thermogenic markers (ESRRG, EBF2) that was also higher in GDM. Among ASPC, all seven clusters were significantly different between depots, with four clusters of adipogenic ASPC (PPARG, FASN, CD36, SREBF1) higher in SAT and three clusters of fibrogenic ASPC (COL1A1, LUM, DCN, FN1) higher VAT. Together, these findings highlight depot-specific differences in adipose cellular populations and an effect of GDM on specific adipocytes expressing thermogenic signature genes in SAT of women with gestational diabetes.

Poster 27

Anti-Inflammatory Properties of Sorghum Varieties: A Food-Based Approach to Address Metabolic Diseases
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Introduction: Sorghum (Sorghum bicolor) stands as a cornerstone in global sustainable agriculture. Systematic studies comparing metabolite profiles across sorghum varieties to their corresponding health effects are lacking. Given the global epidemic of obesity our goal was to determine metabolites in extracts from sorghum varieties and their anti-inflammatory effects in adipocytes.
Methods: We used six diverse genotypes of varying grain colors from Sorghum Association Panel (SAP). Phytochemical profiling was performed using UPLC-MS. Moreover, MTT, and ELISA/qRT-PCR assays were used to assess cell viability and expression of inflammatory markers (IL-6, Mcp1), respectively in 3T3-L1 adipocytes treated with or without lipopolysaccharide (LPS) and/or LPS with or without polar or non-polar extracts. Data were analyzed using GraphPad Prism (10.2.1.) and presented as mean ± SEM (One-way ANOVA, $p< 0.05$). Further, machine learning models (SVM and XGBoost) were used to classify metabolites based on ELISA results.
Results: Sorghums were rich in vitamins, flavonoids, and polyphenols. Random Forest (RF) machine learning analysis identified fatty acyls, steroids, terpenoids, and flavonoids in P162, P130, and P146 lines. Neither polar nor non-polar extracts were toxic to adipocytes, and several extracts significantly ($p\leq0.01$) reduced LPS-induced IL-6 secretion in 3T3-L1 adipocytes: polar (P130, P248) and all non-polar (P130, P146, P162, P170, P248, P273). Similar results were obtained for Il-6 gene expression but not for Mcp1. Correlation analyses revealed key relationships between metabolite categories and secrete IL-6 levels.
Conclusions: Sorghum contains a diverse array of bioactive compounds with anti-inflammatory effects in adipocytes, which merits further investigations in animal models and human subjects. Funding Source: United Sorghum Checkoff Program (MD014-21) Key words: Sorghum, Adipocytes, Obesity, Inflammation, and Metabolic Diseases.

MEDICAL STUDENT

Poster 28

Chronic Dietary Arsenic Exposure in Infancy and the Risk of Neurodevelopmental and Metabolic Disorders
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Multiple epidemiological studies have found associations between early-life arsenic exposure and deleterious health outcomes including diabetes, obesity, and other chronic metabolic disorders. Exposure to arsenic from food is expected to be about three times higher for infants than for adults, in part because their intake per unit body mass is higher and their dietary diversity is lower than adults. Using inductively coupled plasma mass spectrometry (ICPMS), we evaluated the total arsenic concentration of commonly consumed infant products (formula, rice cereals, and teethers) across representative brands (e.g., Similac, Gerber, Enfamil, Kirkland, and Earth's Best) and lots of production. The total arsenic content in infant formula ranged from 2.8-15 ppb, in rice cereals 11-116 ppb, and in teethers from 42-314 ppb. The total arsenic concentrations largely exceeded the 10-ppb regulatory level of arsenic in water set by the United States Environmental Protection Agency (EPA). However, no such regulation currently exists for total arsenic in foods and only limited speciation data is available. Preliminary analysis of the infant food products using liquid chromatography (LC)-ICPMS found Inorganic As(III) (3.5 – 62.7 ppb), DMA (17.9 – 43.3 ppb), and inorganic As(V) (< 2.5 ppb), with Inorganic As(III) prevalent in rice cereals and DMA(V) in teethers. These species are highly toxic and can lead to hypomethylation, DNA damage, neurotoxicity, and chronic inflammation.
Our results highlight that infants are likely chronically exposed to arsenic during sensitive periods of organ development and the subsequent bioaccumulation may lead to chronic deleterious health outcomes.

Poster 29

Better Together: Analyzing the Impact of Social Connection on Medical Student Mental Health
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Background: Suicide is a leading cause of death among young adults, and medical students experience elevated rates of suicide and suicidal ideation. The transition to pass/fail grading in medical school was intended to reduce stress, yet students face increasing pressure to build holistic applications through extracurricular involvement, research, and leadership roles. While student organizations offer emotional support, networking, and time management benefits, excessive involvement may contribute to stress and burnout. This study examines the relationship between organizational involvement and mental wellness among medical students.
Methods: Using the TTUHSC School of Medicine P3-1 Honors Project Omnibus Survey, we collected data from 256 respondents within the TTUHSC medical student community. The survey assessed wellness indices based on the number and type of organizations in which students participated.
Results: A parabolic relationship was observed between organizational involvement and wellness. Students with minimal (0–2 organizations) or excessive (8–10 organizations) involvement had lower wellness scores, while those engaged in a moderate number (3–7 organizations) reported the highest wellness levels. Additionally, students involved in any organization generally exhibited higher wellness scores than those not involved.
Conclusions: Our findings suggest that balanced involvement in extracurricular activities contributes to better mental health among medical students. In the current era of pass/fail grading and increasingly holistic application expectations, students may feel compelled to overcommit. However, excessive or minimal participation appears to negatively impact wellness, emphasizing the importance of selective engagement in meaningful activities. These insights can help guide students in prioritizing their commitments to support mental well-being.

Poster 30

Impact of Stress on Medical Students Dietary Choices
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Objective: The objective of this study is to investigate whether preclinical medical students make more unhealthy choices during periods of high stress.
Methods: This project used the TTUHSC School of Medicine P3-1 Honors Project Omnibus Survey which was sent to all TTUHSC SOM medical students. The survey received a total of 195 responses from MS1/MS2s at TTUHSC and was approved for exempt review by the TTUHSC Institutional Review Board.
Results/Conclusions: The results showed a significant increase ($p<0.1$) in fast food and energy drink consumption during exam weeks (high stress) compared to non-exam weeks (low stress) and a significant decrease in consuming balanced meals during exam weeks ($p<0.1$). The slight increase in snacking during exam weeks could correlate to the decrease in balanced meal consumption. There was an inverse relationship between fast food and balanced meal consumption, indicating unfavorable changes in eating habits during increased periods of stress. In conclusion, there is a correlation between high stress and poor dietary choices.
Significance: Studying the connection between increased BMI and dietary choices in medical students during times of stress, such as exam weeks, is important as healthy habits commonly decline. Increased snacking and lack of regular meal times may indicate binge eating during high stress periods. The risk of obesity development may be increased due to a significant decrease in balanced meal choices. Together, the unhealthy habits developed by medical students due to stress may contribute to increased BMI levels among physicians.

Poster 31

Under the Surface: The Hidden Role of Comorbidities in Mortality Among Burn Patients

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Objective: This study aimed to evaluate the impact of individual comorbidities on mortality risk among burn patients. The goal was to identify conditions that significantly influence patient mortality, aiding in the development of better clinical management strategies.
Methods: Data from burn patient charts were analyzed using multiple regression analysis. Fifteen morbidities, including diabetes mellitus, obesity, alcohol use disorders, chronic obstructive pulmonary disease (COPD), and others, were assessed for their relationship with mortality. The dependent variable was mortality status (alive or deceased). The model accounted for the contribution of each comorbidity to mortality.
Results: The regression analysis revealed a significant overall model, indicating that comorbidities significantly influenced mortality risk. Alcohol use disorders ($p < 0.0001$) and traumatic brain injury ($p = 0.003$) were significantly associated with increased mortality. COPD also showed a strong association with mortality ($p < 0.0001$). Other comorbidities, such as obesity ($p = 0.11$) and atrial fibrillation ($p = 0.72$), did not significantly impact mortality. Hypertension ($p = 0.06$) and chronic renal failure ($p = 0.02$) were marginally significant.
Significance: This study emphasizes the role of specific comorbidities in mortality risk among burn patients. Alcohol use disorders, traumatic brain injury, and COPD emerged as key predictors, underscoring the need for targeted management of these conditions to improve survival.
Conclusions: Effective management of comorbidities is essential for improving outcomes in burn patients. These findings can guide clinical strategies to reduce mortality in this high-risk population. Further research is necessary to refine these associations and identify possible confounding variables.

Poster 32

From Awareness to Action: Community Thoughts on Dementia and Obesity

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Objective: Dementia can be influenced through diet, exercise, and behavioral changes. Obesity can also be influenced by these factors. Broadly, neurocognitive impairment or degeneration is associated with higher rates of obesity and metabolic disorder. We performed a focus group with three distinct populations to determine the community's needs, wants and understanding of these diseases.
Methods: Three independent populations which were deemed underserved and at-risk were identified; a Hispanic community center with participants age 65+, an African-American community center age 60+, and a Caucasian community center age 60+. A series of 10 questions were asked ranging from general understanding of neurocognitive impairment to steps that can be taken to improve overall metabolic health.
Results: It was found that the African-American community was most interested in learning and recognizing signs and symptoms. The Caucasian community expressed the greatest interest in risk factors and prevention. Meanwhile the Hispanic community with participants of greatest age and predominately Spanish speaking expressed interest in signs and symptoms, risk factors and prevention, early detection, and wanted a broader understanding of both topics.
Significance: The Permian Basin has a higher prevalence than the national average of both obesity and dementia; 46.6% to 40.3%, and 12.4% to 11.9% respectively. This demonstrates the need for interventions that target this healthcare shortage region, West Texas.
Conclusions: Our focus groups reveal that language, and cultural barriers may exist making it difficult for at-risk populations to comprehend disease patterns and implement protective measures. Overall, community outreach attempts must be improved.

Poster 33

Burns, Borders, and Comorbidities: A Regional Analysis of Health Disparities in Texas and New Mexico
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Abstract Background: Burn injuries present a significant public health burden, with comorbidities potentially influencing patient outcomes and healthcare access. Understanding the distribution of comorbidities among burn patients from Texas (TX) and New Mexico (NM) may offer insights into regional disparities in health status and care utilization.
Objective: This study investigates the association between comorbidities and the state of residence (TX vs. NM) among burn patients treated at a regional burn center in West Texas.
Methods: A multiple linear regression analysis was conducted on a randomly selected dataset of over 2,000 burn patients treated at a regional burn center in West Texas, with state of residence (TX = 1, NM = 0) as the dependent variable. Fifteen comorbidities, including diabetes, obesity, chronic obstructive pulmonary disease (COPD), hypertension, and substance use disorders, were included as independent variables.
Results: The model was statistically significant ($p < 0.001$). Among the comorbidities analyzed, COPD ($p < 0.001$), Alcohol Use Disorder ($p = 0.0062$), and substance use disorder ($p = 0.0008$) were significantly associated with lower likelihoods of residing in TX. Other conditions, such as diabetes, obesity, hypertension, and congestive heart failure, were not significantly associated with state of residence.
Conclusion: Substance use disorder, alcohol use disorder, and respiratory conditions may contribute to regional differences, with New Mexico burn patients presenting with higher rates of these comorbidities. Further research is needed to explore underlying sociodemographic and healthcare access factors influencing these patterns.

Poster 34

Evaluating Food Insecurity, Obesity, and Nutritional Support in Lubbock, TX
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Abstract Objective: This study aims to evaluate the relationship between food insecurity and obesity in Lubbock, TX which are two significant public health concerns within the region. The main objective is to assess whether higher food insecurity rates correlate with increased obesity prevalence as well as to evaluate the impact of local nutritional support organizations.
Methods: A literature review was conducted alongside data collection from national and local online resources. The study examined food insecurity rates, obesity prevalence, and the roles of local organizations seeking to combat food insecurity.
Results: Data analysis revealed Lubbock County experiences food insecurity at a rate of 22.5%, surpassing both state and national averages. Similarly, obesity rates within Lubbock are 40% which is significantly higher than comparative statistics. While a direct statistical correlation between food insecurity and obesity remains inconclusive, the study suggests that nutritional quality, rather than food quantity, may contribute to obesity in food-insecure populations. Encouragingly, food insecurity has declined over the past decade, though it remains a persistent concern.
Conclusion: Despite progress in reducing food insecurity, disparities persist in Lubbock County. Strengthening local partnerships, expanding food assistance programs, and incorporating nutritional education into food distribution efforts are essential next steps. Future research will investigate the factors behind the decline in food insecurity and further explore the nutritional quality of food accessible to affected populations. Addressing these public health challenges requires collaboration among policymakers, stakeholders, and community organizations to develop sustainable solutions for improving both food security and health outcomes.

Poster 35

The Impact of E-Cig Flavors on Nicotine Addiction on TTUHSC Medical Students

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Objective: Would medical students who vape still do so if there were no flavors available?
Background: After the FDA banned flavored pod sales of JUUL in 2019, the use of mango-flavored pods decreased from 62.8% to 36.9%, and other restricted flavors also significantly decreased (Morean et al., 2018). A national online survey of adults ages 18-64 reported flavor as the third most common reason for vaping initiation (R.L. Landry et al., 2019). Our study aimed to see how flavors impacted purchasing habits of medical school students. We hypothesized that if there were no flavors available for purchase it would decrease the consumption of nicotine. Data collection This project used the TTUHSC School of Medicine P3-1 Honors Project Omnibus Survey. The survey, which included 20 question sets that branched according to respondent groups, received a total of 530 responses from the TTUHSC community. We primarily focused on the 47 responses from medical students who indicated a prior or current use of vape products. This project was approved for exempt review by the TTUHSC Institutional Review Board.
Results and Conclusions: Out of participants that indicated that they did vape, most (37 out 47) were former smokers. Out of current smokers, there was a preference for fruity flavors (80%). Out of current smokers, if flavors were removed by the FDA off the market, most answered they would “probably not” vape. Our study focused on only one medical school, which limits the representation of medical students in various environments.

Poster 36

Assessing Nutritional Habits Among Medical Students

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Introduction: Maintaining nutrition is critical to fostering a healthy lifestyle. Good eating habits support positive mental and physical health[1]. Medical students may struggle to develop healthy nutritional habits due to limited nutritional education and the high-stress environment of medical school[2]. These challenges can cause negative outcomes such as poor mental health, physical wellbeing, and worsening academic achievement[3]. Moreover, nutritional habits may deteriorate due to increased stress associated with significant milestones within medical education such as major board exams or transitioning to clinical clerkships[4]. This study aims to investigate the impact transitioning to clinical clerkships have on the nutritional habits of medical students and its potential effects on physical and mental wellbeing.
Method: We queried the PudMed database in search of related articles. We intend to release a survey to clinical medical students examining their current nutritional habits and overall physical and mental wellbeing. Furthermore, third-year medical students will also be asked how these habits changed from preclinical to clinical rotations.
Results: We are currently in the data-collecting phase of the project and have an insufficient amount of data to conduct research on.
Conclusion: While there is an abundant amount of information regarding the overall health of medical students, we are examining the specific disparities faced when transitioning from preclinical to clinical rotations. Additionally, more information regarding developing and maintaining healthy habits is imperative to the physical, mental, and academic success of medical students.

Poster 37

A Comparison of Nutritional Competency Attainment between Schools of Differing Socioeconomic Status
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Objective: Nutrition education for children plays an important role on long-term health outcomes, influencing dietary behaviors, weight management, and risk for chronic diseases. This pilot study evaluates the effectiveness of an after-school nutrition program in two elementary schools within Lubbock Independent School District (LISD) with differing socioeconomic backgrounds. This study assesses students' knowledge pre- and post-intervention to determine how well the program improves nutritional literacy and if socioeconomic status influences learning outcomes.
Methods: A one-hour after-school nutrition program was implemented at Brown Elementary (lower socioeconomic status) and Honey Elementary (higher socioeconomic status) within LISD. The curriculum, based on the Texas Administrative code: Title 19, addressed state-mandated nutritional competencies on fats, sugar, protein, and nutrition labels. Qualitative and quantitative data were collected to gauge student understanding of these topics before and after the program.
Results: Both schools showed improved nutritional knowledge post-program. Students at Brown Elementary better identified healthy fats, recommended sugar intake, and understood nutrition label content. Students at Honey Elementary showed more accurate knowledge of sugar content. Protein knowledge was weak across both schools, with some students incorrectly identifying protein sources (e.g "veggies", or "strawberries"), though improvements in identifying diverse protein sources were noted.
Conclusion: The after-school nutrition program is a valuable tool for enhancing state-required nutritional competencies. Further studies will explore its impact by expanding lessons to more schools and increasing curriculum depth through multiple lessons at each school.

GUEST POSTER - GRADUATE STUDENT

Poster 38

The Longest Living Mammal; Insights from the Bowhead Whale Metabolome
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Objective: Identify the key metabolites and understand their physiological roles that contribute to the bowhead whale's (BHW) unique mammalian physiology, particularly its longevity, adaptation to the harsh marine environment, and coping with/maintain large lipid stores.
Methods: Using liquid and gas chromatography coupled with high-precision mass spectrometry, we characterized the bowhead whale metabolome using both targeted (582 identified metabolites) and untargeted (>15,000 features) approaches in the liver, kidney, heart, and brain. For comparison, terrestrial mammals: pig, rabbit, dog, and goat were also profiled.
Results: The metabolome of the bowhead whale is unique compared to terrestrial mammals, with over 1189 features (~10%) being significantly different, particularly in the liver lipidome. The BHW has elevated levels of polyunsaturated fatty acids (PUFAs, multiple double bonds), which prevent cells from solidifying at lower temperatures. This is crucial for animals with low basal body temperatures (~34°C) and survival in cold environments. Elevated osmolytes such as Trimethylamine oxide (TMAO) aid the bowhead whale in regulating water homeostasis in response to the saline environment. BWHs have lower levels of cellular amino acids, a signature associated with longevity.
Conclusion: While identifying metabolite signatures of the BHW, we saw that BHW's liver accumulate several metabolites, particularly osmolytes and PUFA lipids, that are linked to diseases like cardiovascular disease and steatosic liver disease. However, the BHW poses a long lifespan despite accumulating said detrimental metabolites, which suggests that the BHW has made other adaptations to its physiology in order to utilize these small molecules and simultaneously bypass their detrimental side effects.