Current TST – T32 Trainees

(August 2024 – August 2025)

Trainee: Leen F. Abazid, MD

Degree Sought: Ph.D.

Program: IBMS – Radiological Sciences – Neuroscience Imagine Track

Research Interest: Uncover the neural mechanisms involved in brain alterations across obesity, eating disorders, and food addiction, with the goal of developing imaging biomarkers to guide therapeutic interventions.

Mentor: Peter T. Fox, MD, Department of Radiology/Research Imaging Institute

Research Topic: Brain Alterations in Obesity Subtypes, Syndromic Obesity in Prader-Willi Syndrome, Eating Disorders, and Weight Loss.

Leen is a 6th-year Ph.D. student in radiological sciences with a research focus on the brain structural and functional alterations related to obesity subtypes and eating disorders. She obtained her MD from the University of Damascus in Syria in 2006. She began her medical residency before it was interrupted by the war, prompting her to relocate to the United States for safety. Leen's interest in medical imaging developed during medical school and residency, where she was drawn to its clinical applications and challenges. Her commitment to medicine and passion for improving patient care drove her to pursue her journey in research. She started as a research assistant with Dr. Amy Garrett at the Research Imaging Institute (RII), where she contributed to a project analyzing brain volume changes associated with Trauma-Focused Cognitive Behavioral Therapy (TF-CBT) in youth with PTSD, using FreeSurfer analysis on structural MRI scans.

Leen has been awarded the competitive institutional predoctoral fellowship NIH/NCATS T32 for two consecutive years. She currently conducts her research under the mentorship of Dr. Peter Fox in the Department of Radiology. During her first year, she attended several professional meetings, including the Obesity Week Meeting in Dallas, Texas, where she won the Neuroscience Section Blitz Talk Award in October 2023. Driven by the growing prevalence of obesity worldwide, Leen’s research focuses on understanding the neurobiological effects of weight gain and adiposity. Through neuroimaging, she investigates the neural alterations associated with obesity and their links to neurological disorders such as dementia and Alzheimer’s disease, aiming to quantify subtle changes and develop imaging biomarkers that can inform and enhance obesity treatment strategies.

Trainee: Iriscilla Imabary Ayala, PhD

Affiliation: Postdoctoral Research Fellow, Medicine Department, Diabetes Division

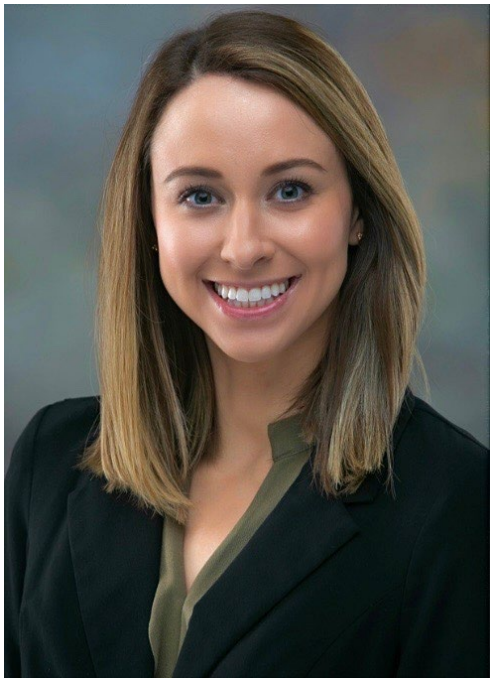
Research Interest: Liver Physiology, Nonalcoholic Fatty Liver Disease, Type II Diabetes, genetic influence on metabolic diseases

Mentors: Luke Norton, PhD, Assistant Professor, Department of Medicine, Diabetes Division

Research Topic: *The Role of TCF7L2 in Hepatic Metabolic Zonation*

Iriscilla Ayala graduated with her doctoral degree from University of Texas Health San Antonio in Cellular and Structural Biology in 2019, supported by Ruth L. Kirschstein Predoctoral Individual National Research Service Award. Her doctoral project utilized mouse models, focused on investigating the role of transcription factor 7-like 2 (TCF7L2), a key transcriptional effector of the Wnt pathways, on metabolic zonation of the liver. Single nucleotide polymorphisms within TCF7L2 gene are highly linked to increased type 2 diabetic risk in humans. In mouse models, whole body knockouts of TCF7L2 are postnatally lethal. Therefore, the mouse model was genetically modified to inactivate TCF7L2 in hepatocytes specifically. Under the guidance of her mentoring team, she has developed skills in basic biomedical research and was able to elucidate how TCF7L2 regulates metabolic zonation in the liver lobule.

Iriscilla was awarded the competitive institutional postdoctoral fellowship NIH/NCATS T32 for two consecutive years. In April 2024, she attended the Association for Clinical and Translational Science (ACTS) in Las Vegas, NV, and was awarded the Blue Ribbon (Top 25%) Poster award and won first place in the poster competition in the 11th Annual San Antonio Postdoctoral Research Forum in 2023. Her current research project now focuses on how TCF7L2 regulates lipid and glutamine metabolism in murine hepatocytes in a normal and following a choline-deficient amino acid-defined high fat (CDAHFD), a well-established diet to induce fibrosis, steatosis, and steatohepatitis. Transcriptionally inactive TCF7L2 mice displayed disrupted glutamine metabolism and cholesterol homeostasis which led to increased susceptibility to hepatic fibrosis. Meanwhile, in preliminary data from human liver biopsies, TCF7L2 expression was reduced patients with increasing fibrosis in nonalcoholic steatohepatitis (NASH).



Trainee: Kaitlyn R. Bejar

Degree Sought: Ph.D.

Program: IBMS- Cell Biology Genetics and Molecular Medicine Discipline

Research Interest: Biomarkers for aggressive disease, specifically prostate cancer

Mentor: Robin Leach, PhD**,** Department of Cell Systems and Anatomy

Research Topic: *N-Glycans to Predict Prostate Adenocarcinoma Outcome and the Factors that Influence Them*

Kaitlyn Bejar graduated with a Bachelor of Science in Psychology from Texas A&M University in 2016. During her time at Texas A&M, she was an Undergraduate Research Scholar in a cardiovascular chemistry lab and was introduced to many principles that are necessary to do well in the scientific field. The knowledge she gained during her undergraduate year in the lab carried over and expanded during her time as a master's student in a pancreatic cancer lab at UT Health SA. She performed immunohistochemistry, cell culture, mice experiments, and molecularly analyzed tumors. Upon completion of her master's, she joined a clinical research team in the Department of Urology at UT Health SA where she helped coordinate different clinical cancer studies and recruit into the Mays Cancer Biobank.

Kaitlyn is now a fifth-year Ph.D. candidate working on her dissertation to develop a prognostic marker for prostate cancer. She was awarded the competitive institutional predoctoral fellowship NIH/NCATS T32 for two consecutive years. Her current research project is focused on identifying novel N-glycan biomarkers for aggressive prostate cancer. Preliminary data has shown certain N-glycans and collagen may be present on more aggressive tumors. The N-glycans and collagens identified may be used to predict metastatic disease at time of primary treatment, potentially even at time of diagnosis by biopsy. This could help further guide treatment decisions of men with prostate cancer. Kaitlyn is also working to understand what factors may influence these differences in prostate tumor N-glycans, such as genetics or diet. Kaitlyn believes the TST T32 Program would help further her goal of participating in diverse science with direct impacts on patient populations.

Trainee: Cody A. Black, PharmD, PhD

Affiliation: Postdoctoral Research Fellow, Division of Pharmacotherapy and Translational Sciences (PTSCI)

Research Interest: Mechanisms of bacterial virulence and resistance; Optimizing diagnostics and treatment strategies for patients with multidrug resistant infections

Mentor: Grace C. Lee, PharmD, PhD, Division of Pharmacotherapy and Translational Sciences, College of Pharmacy, The University of Texas at Austin

Research Topic: *Clinical and molecular epidemiology of multidrug-resistant bacterial infections in South Texas*

Cody A. Black graduated with his Doctor of Pharmacy (PharmD) from the University of New England, College of Pharmacy in 2018. In 2019, he entered the Translational Science (TS) PhD program at The University of Texas at Austin, College of Pharmacy. His PhD research focused on characterizing and understanding the prevalence and resistance mechanisms common to non-carbapenemase producing carbapenem-resistant Enterobacterales in South Texas. During this time he received 12 distinct fellowships/awards from NIH/NIAID, AFPE, and UT Austin, published four papers and one book chapter, presented 19 abstracts at international, national, and local conferences, two of which were selected for platform presentations.

Following this, in 2023, Dr. Black was selected into the competitive postdoctoral fellowship (NIH/NCATS T32) at the University of Texas Health Science Center in San Antonio. Now in his second year of the program, his work evaluates host responses to bacterial infections and treatments, with a particular focus on bacterial virulence and resistance to last-line antibiotics. His ultimate research goal is to develop strategies/tools which allow clinicians to provide more timely and accurate therapeutic decisions, and to discover novel targets in combatting these recalcitrant infections.

Trainee: Marissa A. Brown

Degree Sought: Ph.D.

Program: Radiological Sciences - Medical Physics Imaging Track

Research Interest: Magnetic Resonance Imaging, Magnetic Resonance Spectroscopy, Liver Disease

Mentor: Geoffrey David Clarke, PhD, Department of Radiology

Research Topic: *Magnetic Resonance (MR) Biomarkers for Hepatic Metabolism in Humans with Metabolic Dysfunction-Associated Steatotic Liver Disease (MASLD)*

Marissa is a fourth-year Ph.D. candidate in the Department of Radiological Sciences. She graduated with a Bachelor of Science in Nuclear Engineering in 2019 from the University of Wisconsin-Madison. During her undergraduate studies, Marissa performed research in the lab of Thermal Hydraulics run by Dr. Mark Anderson where she was responsible for the fabrication and construction of various experiments involving molten salts, liquid sodium, and supercritical CO_2 testing for developing the next generation of nuclear technology. Shortly after graduation, she decided to pursue a graduate degree in the field of Medical Physics, which applies many of the principles she learned while studying Nuclear Engineering to the medical field. She then joined Dr. Geoffrey Clarke's lab and began investigating metabolic disorders, which disproportionately impact Mexican Americans.

Marissa was awarded the competitive institutional predoctoral fellowship NIH/NCATS T32 for two consecutive years. Her proposed work as a T32 trainee will focus on the use of magnetic resonance imaging (MRI) and spectroscopy (MRS) for the assessment of liver disease under the mentorship of Dr. Geoffrey Clarke at the Research Imaging Institute. MRI and MRS technology can non-invasively influence the diagnosis, treatment, and prevention of metabolic dysfunction-associated steatotic liver disease. ^{1}H-MRS is already proven to be an accurate method for determining fat fraction in the liver; whether diffusion MRI will provide a clinically useful assessment of liver fibrosis remains unconfirmed. While limited, recent literature on metabolic effects of liver disease through measurements of phosphorus-31 metabolite concentrations exists. Over the course of the next few years, she plans on investigating methods for assessment of liver disease leading to improved diagnosis and treatment. Her goal upon completion of her graduate studies is to become an academic researcher and continue to study the applications of MRI/MRS technology.

Trainee: Alison M. Luckey, PhD

Affiliation: Postdoctoral Research Fellow, Glenn Biggs Institute for Alzheimer's & Neurodegenerative Diseases

Research Interest: Epidemiology of brain aging, Neurodegenerative Diseases, Alzheimer's disease, Vascular Cognitive Disorders, Biomarkers

Mentors: Claudia L. Satizabal, PhD, Glenn Biggs Institute for Alzheimer's & Neurodegenerative Diseases

Research Topic: *Elucidating neuroimaging, plasma, and genetic markers in diverse community settings*

Dr. Luckey earned her PhD in Psychology from Trinity College Dublin in 2022. She was awarded the prestigious Ussher Fellowship to investigate the potential of transcutaneous electrical stimulation to improve memory through targeted neuroplasticity changes. Her research focused on the locus coeruleus-noradrenaline system and contributed to the growing field of neuromodulation as a therapeutic intervention for neurocognitive disorders.

Dr. Luckey is a Postdoctoral Research Fellow at the Glenn Biggs Institute for Alzheimer's and Neurodegenerative Diseases, working in the Populational Neuroscience Core of the South Texas Alzheimer's Disease Research Center. Under the mentorship of Dr. Claudia Satizabal, Population Neuroscience Core Director, her research training centers on the epidemiology of brain aging and dementia.

Within the Population Neuroscience Core, Dr. Luckey works with well-characterized population-based cohorts with a broad set of neurological, biomarker, cardiovascular, and genomic data. Currently, she is focused on two projects utilizing neuroimaging, plasma, and genetic markers. Her first project aims to leverage the joint contribution of blood-based and neuroimaging-based biomarkers to sensitively and specifically capture neuroaxonal injury and white matter microstructural damage—two features of Vascular Contributions to Cognitive Impairment and Dementia (VCID). The overarching goal of this project is to provide supporting evidence for the use of a VCID susceptibility/risk multi-biomarker and establish its utility for future use in dementia clinical trials. The second project involves a genome-wide association study to discover novel genetic variants related to visual function, including visual memory and visuospatial organization and discrimination skills. This project seeks to identify genetic factors that may influence visual function and to identify genes that may regulate both visual memory and visuospatial functioning.

Trainee: George Parra

Degree Sought: Ph.D.

Program: IBMS - Biochemical Mechanisms of Medicine

Research Interest: Understanding structural and dynamic effects of the EWS::FLI1 interactome on the EWS low complexity domain function

Mentor: David S. Libich, PhD, Assistant Professor in the Department of Biochemistry & Structural Biology

Research Topic: *Understanding structural and dynamic effects of the EWS::FLI1 interactome on the EWS low complexity domain function*

George Parra is a fifth-year PhD candidate in the department of Biochemistry and Structural Biology. He attended Texas State University in San Marcos for both his Bachelor's and Master's studies. During his undergraduate, he researched the impact of charge-charge interactions on intrinsically disordered protein (IDP) backbone extension, using the tumor suppressor, p53 as his model. Realizing his passion lied in asking questions that could be rigorously tested he pursued this journey and soon was awarded the South Texas Doctoral Bridge scholarship at Texas State University to pursue a Master of Science in Biochemistry. As a master's student, he continued his work on charge effects on the tumor suppressor, p53, and the biological relevance of phosphorylation on p53 structure modulation. Alongside that work, he investigated the impacts of temperature and sequence order on protein secondary structure preferences, which resulted in a co- authorship publication.

It was during his master's studies that he decided his overarching goal is to create a research program aimed at developing a comprehensive understanding of how protein-ligand interactions involving intrinsically disordered proteins (IDP) impact cellular processes. His interests in how alterations in IDP gene expression and structural dynamics contribute to human disease led him to apply to University of Health at San Antonio where George was awarded the competitive institutional predoctoral fellowship NIH/NCATS T32 for two consecutive years. At UTHSA he is studying the intrinsically disordered fusion protein EWS::FLI1 under Dr. David Libich. EWS::FLI1 acts as an aberrant transcription factor, driving the pediatric cancer Ewing Sarcoma. His immediate research project revolves around building an interactome dataset for EWS-FLI1, and the effects EWS::FLI1 interacting proteins have on the structural propensities and dynamics of EWS::FLI1. His approach will drive forward the identification and development of new targeted treatments in Ewing Sarcoma, as well as be broadly applicable to other fusion-driven pediatric cancers.

Trainee: Kathleen (Kate) Tuite

Degree Sought: Ph.D.

Program: IBMS - Neuroscience

Research Interest: Cognitive flexibility, chronic stress, orbitofrontal cortex, circuits

Mentor: David A. Morilak, PhD, Department of Pharmacology

Research Topic: *Role of thalamic afferents to the orbitofrontal cortex in the effects of chronic stress on reversal learning*

Kate Tuite is a sixth-year PhD candidate in the department of Pharmacology. They attended the University of Texas at Austin and obtained their Bachelor of Science in Neuroscience in 2016. Their undergraduate research experience in Dr. Rueben Gonzales's laboratory at UT Austin was focused on finding more effective treatments for alcohol use disorder. Their time with Dr. Gonzales resulted in the successful funding of their own independent project under the Undergraduate Research Fellowship studying dopamine dysfunction in the amygdala and how this dysfunction affected alcohol consumption. The research they conducted as an undergraduate was their first introduction into substance use disorders and how animal models can be used to develop more efficacious treatments for these disorders using behavioral approaches. Kate then transitioned into a molecular biology laboratory under Dr. Katja Lamia at the Scripps Research Institute studying circadium rhythm genes and how they are disrupted in cancer. The experience they gained in this laboratory allowed them to develop skills outside of behavioral techniques and gain understanding into another aspect of biology. They collaborated with molecular biologists to study different protein cleavage sites and determine how these sites contribute to cancer formation.

Following their experience in Dr. Lamia's laboratory, they transitioned into the PhD program at UTHSA. Because of their interests in neuroscience and mechanisms underlying psychiatric disorders, for their doctoral dissertation, they chose Dr. Morilak as their supervising professor as his research program on the detrimental effects of chronic stress and the cognitive symptoms of neuropsychiatric diseases aligns with their own interest. Kate's dissertation research focuses on how projections form the central medial and paraventricular thalamus to the orbitofrontal cortex may be disrupted in chronic stress and how these disruptions contribute to cognitive symptoms of psychiatric disorders. They are using several different approaches including chemogenetics, a model of chronic stress, and a behavioral task designed to examine cognitive functioning mediated by the orbitofrontal cortex. The results of this research will lead to a better understanding of the underlying neural mechanisms of cognitive flexibility and how this process is disrupted by chronic stress, leading to more potential targets for therapeutics in the future.