



2025 Biomedical Research Award Dr. Eliane Dutra, University of Connecticut Health

Biography

I received my DDS from the Federal University of Santa Maria and a MSD in Orthodontics from the Pontifical Catholic University of Parana, in Brazil. I moved to the United States and obtained a PhD degree and an orthodontic certificate from the University of Connecticut Health (UCH). I am currently a full-time Assistant Professor in the Division of Orthodontics at the UCH. I dedicate my time pursuing my passion towards craniofacial research, as well as contributing to orthodontic graduate students' education and patient care.

Project Synopsis

Osteoarthritis (OA) is a degenerative disease characterized by progressive loss of cartilage and subchondral bone sclerosis. Currently, treatments for OA are limited to educate the patient about the disease and its management, and to control pain with medications. There is no available treatment to cure OA; loss of the articular cartilage is progressive and irreversible. OA can involve the temporomandibular joint (TMJ) as well. TMJ-OA significantly impairs patients' quality of life by causing acute and chronic pain. The available treatments for TMJ-OA include non-surgical approaches, such as occlusal appliances, cold and warm packs, medications and physiotherapy, and surgical options such as arthrocentesis or joint replacement. These treatments only control patients' symptoms and do not cure TMJ-OA. Fibroblast growth factor 18 (FGF-18) is a member of the fibroblast growth factor family with essential roles for endochondral ossification and chondrogenesis, selectively binding to FGFR-3 receptor. Our data has shown that FGF-18 protein expression and phosphorylation of FGFR-3 are significantly reduced in the cartilage of the TMJ as mice age, suggesting lack of FGF-18 signaling could contribute for the development of TMJ-OA. Moreover, our recent data has shown that local injection of Recombinant Mouse FGF-18 (rmFGF-18) into injured TMJ of mice leads to a significant increase in fibrocartilage thickness, suggesting repair of the induced degeneration. Taken together, these data suggest a critical role of FGF-18 in TMJ fibrocartilage protection and regeneration, but the role of FGF-18 for TMJ maintenance and development of TMJ-OA remain to be determined. Here we propose to induce lineage specific deletion of FGF-18 in the osteochondral tissues from the TMJ. We plan to cross mice with a floxed allele of FGF-18 ($Fgf18^{fllox}$) with the α SMA-CreER^{T2} (chondrocyte progenitor marker) and the Aggrecan-CreER^{T2} (mature chondrocyte marker) mouse models. Our central hypothesis is that FGF-18 deletion will lead to early TMJ fibrocartilage degeneration.

Importance of AAOF Funding

My journey as a junior faculty has been challenging but also very gratifying, and the funding from AAOF has been helping to establish myself as a successful academician in Orthodontics. Preliminary data collected thanks to the funds provided by AAOF were invaluable for my NIH KO1 award. My goal is to continue to grow as a clinician and craniofacial scientist. The support from AAOF through the 2025 Biomedical Research Award (BRA), *Burstone-Indiana Biomechanics Award*, will provide the necessary support to implement new research ideas, expanding my possibilities to create innovations in the field and new grants submission.