Orthodontic Faculty Development Fellowship Award

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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 and the program director of the orthodontic predoctoral curriculum. I dedicate my time to undergraduate and graduate education, as well as to research and patient care.

Project Synopsis

Temporomandibular Joint Osteoarthritis (TMJ-OA) is a degenerative joint disease characterized by cartilage loss and sclerosis of the subchondral bone, causing pain and disability. Clinical management of TMJ-OA is largely palliative and there is a critical need to develop new therapeutic interventions that are anabolic for the TMJ cartilage and subchondral bone which could prevent or reverse degeneration of the TMJ cartilage. Intermittent administration of Parathyroid Hormone (I-PTH) is a FDA-approved drug for the treatment of bone loss due to conditions such as osteoporosis. Our previous data has shown that administration of I-PTH in young and adult mice leads to increased chondrocyte proliferation, cartilage thickness and secretion of extracellular matrix of the TMJ cartilage. Moreover, I-PTH treatment increased bone turnover and mineralization of the subchondral bone. Taken together, these results suggest that I-PTH administration causes anabolic effects at the subchondral region of the mandibular condyle while triggering anabolic and protective effects at the TMJ cartilage. Whereas the anabolic mechanisms of I-PTH in bone are known, the mechanisms by which I-PTH exerts its anabolic effects on the chondrogenic lineage of the mandibular condylar cartilage (MCC) remain to be understood. The purpose of this project is to determine if I-PTH treatment could be used as an anabolic drug to treat degenerative disorders of the TMJ. In addition, we aim to elucidate the mechanisms by which I-PTH exerts its effects at the MCC. Fibroblast growth receptor 3 (FGFR3) is an important regulator of skeletal development, especially in endochondral tissues. It remains to be determined whether the anabolic effects of I-PTH are mediated by FGFR3. The results of this study will shed new light on the effects of I-PTH on TMJ cartilage, and provide insight into the mechanisms by which joint degeneration may be slowed or reversed, highlighting the role of FGFR3 on the effects of I-PTH on the mandibular condyle.

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. My goal is to continue to grow as a clinician and craniofacial scientist. The support from AAOF through the Orthodontic Faculty Development Fellowship Award will provide the necessary support I need to initiate my path in becoming an independent investigator.