

## Biomedical Research Award

### Dr. Sumit Yadav, *University of Connecticut Health Center*

Dr. Yadav is an Associate Professor in the Division of Orthodontics in School of Dental Medicine at University of Connecticut Health Center. He is a board-certified orthodontist and currently acts as a research director for the orthodontic residents. He has published over 75 peer reviewed journal papers. Currently, collaborating with Musculoskeletal Biologist and Biomedical Engineers at UCONN Health Center, he is expanding his research arena and has been devising therapeutic strategies for the treatment of degenerative diseases of the cartilage of TMJ.



#### **Project Synopsis:**

Parathyroid Hormone (PTH) is the only FDA approved drug therapy used for the treatment of osteoporosis in postmenopausal females and osteoporosis in males. Less understood are the effects of PTH on the chondrogenic lineage of the mandibular condylar cartilage (MCC). Recognizing the cellular and molecular stages of the chondrogenic lineage of the MCC and the osteoblastic lineage of subchondral bone is a fundamental requirement for evaluating the effects of hormones and other potential drugs that can modulate the lineage differentiation and/or activity. The long-term goal of the candidate is to understand the signaling mechanisms regulating the proliferation, extracellular matrix synthesis of the MCC and to develop therapeutics to regenerate MCC that can recapitulate the cellular composition, structure and load bearing capacity of the MCC.

Specific Aim: To evaluate the role PTH plays in dedifferentiation and redifferentiation of chondrocytes.

#### **Benefit to Orthodontic Education:**

Temporomandibular joint disorders (TMD) are estimated to affect 10-36 million individuals in the United States per year. Approximately 10% of people who have TMD have irreversible damage to the joint. Degenerative diseases of the TMJ affect the mandibular condylar cartilage, the TMJ disc, and the cartilage of the glenoid fossa. This AAOF award will support the development of evidence whether FDA approved drug (PTH) can be used for the treatment of degenerative disorders of TMJ and the mechanism behind it.

#### **Importance of AAOF Funding:**

The AAOF Biomedical grant will provide me the opportunity to publish preliminary data, which will be essential to be competitive and obtain a funding from NIH/NIDCR with a focus on basic science questions related to clinical issues in orthodontics.