

Biomedical Research Award

Dr. Jing Chen, *Columbia University*

Biography

I completed my PhD Program in Oral Biology and orthodontic residency program in University of Connecticut. I am working as a full-time Assistant Professor of Dental Medicine in the Division of Orthodontics at the Columbia University College of Dental Medicine, and presently serving as the Program Director of the postgraduate orthodontics program. I am also a board certified orthodontist.

My research has focused on the temporomandibular condyle area and developed the murine model to study temporomandibular condylar changes related to loading and/or estrogen level. Years of hard work in this field helped me develop the skill and experience in conducting research and lab management.



Brief description of the project

As one type of chronic TMD, TMJ degenerative joint disease (TMJ-DJD) is characterized by abrasion and deterioration of the mandibular condylar fibrocartilage due to increased protease activity that results in orofacial pain and discomfort during function. Of all TMD patients, 8-15% have TMJ-DJD and it afflicts an older population than other TMD diseases. Currently, I am trying to develop a therapeutic/protective strategy for the developing degenerative diseases of TMJ. We have found that one of the most significantly mediated genes in the TMJ by estrogen replacement in Ovx wild type mice was Alpha 2 Macroglobulin (A2M), which was confirmed by q-PCR analysis of A2M gene expression in a separate, independent experiment. We have further found that A2M dose dependently inhibited degradation of collagen type 1 and 2 from adult WT mandibular condylar cartilage organ cultures. A2M has been shown to inhibit the progression of surgically induced knee osteoarthritis by a unique bait and trap mechanism that is able to sequester cytokines and proteases, inhibiting their activity. However, the role of A2M in mediating TMJ-DJD remains unknown. Therefore, our hypothesis for this project is that A2M inhibits protease activity protecting the TMJ from degeneration. And Intra-articular injections of A2M may become a novel treatment modality for all patients who suffer from TMJ-DJD.

Importance of AAOF funding

It is an honor to have been designated the recipient of the AAOF 2018 Robert James Bray Biomedical Research Award. Currently I am teaching post-doctoral orthodontic programs at Columbia University. The award allows me to continue my research, attend professional meetings, and also help develop the residents' interest in research.

The award from the Foundation provides invaluable support for professional and career development. The AAO Foundation award provides necessary funds for me to start an independent research project, collecting pilot data as basis for future NIDCR funding.