

Research Aid Award

Dr. Joy Chang, *University of Connecticut Health Center*

Biography

Dr. Chang is a second-year orthodontic resident at University of Connecticut Health Center. She completed her dental school training at the University of California, San Francisco. Prior to her dental education, she completed her B.S. in Chemical and Biomolecular Engineering at Johns Hopkins University. She had also previously completed a post-baccalaureate Intramural Research Training Award program at the National Institutes of Health. Dr. Chang is the 2016 recipient of the Northeastern Society of Orthodontists Resident Research Award. She is passionate about translational research, and wishes to pursue a career as a clinician-scientist in the future.



Project Synopsis

Orthodontic tooth movement (OTM) typically requires 18-36 months of treatment. The duration of orthodontic treatment often leads to detrimental outcomes such as white spot lesions, caries, root resorption, or patient burnout. Various methods are currently employed to accelerate orthodontic treatment, including minimally invasive techniques such as vibration and laser, or invasive techniques like corticotomy and corticision. Minimally invasive techniques are not shown to be clinically effective in accelerating OTM. Invasive techniques induce regional accelerated phenomenon (RAP), which accelerates OTM for a few weeks, after which the rate of OTM declines. Due to the transient effects of accelerated OTM from invasive techniques, the surgical insult often needs to be repeated throughout treatment, resulting in discomfort and increased cost to the patient. There are currently no lasting and effective strategies to shorten the treatment time. Accordingly, there is an unmet need for a biologically and clinically effective approach to shorten treatment time. Our project addresses this unmet need by employing RANKL injectable formulations to provide an optimal dose while minimizing side effects. We hypothesize that a sustained and optimal dose of exogenous RANKL presentation through injectable particulate formulations will accelerate bone modeling and OTM as compared to control treatments without the factor. Our project will benefit orthodontic education by elucidating mechanisms for accelerating OTM, potentially contributing to a product which could clinically shorten orthodontic treatment time in the future.

Importance of AAOF Funding

The AAOF RAA is essential to this project by assisting in the funding and support, especially in conducting the costly animal studies. The AAOF is also instrumental in helping me embark on my career as a clinician-scientist in academia by providing the experience needed to become an independent investigator.