

Research Aid Award

Dr. Jia Liu, *University of Connecticut Health Center*

Biography

Dr. Liu is a second-year orthodontic resident at the University of Connecticut Health Center. She completed her dental degree at the University of Connecticut. Prior to dental school, she received her PhD in Cell Biology from the University of Alabama at Birmingham and completed her post-doctoral training at the Joslin Diabetes Center, Harvard Medical School. In the past, her research has been focused on the signaling pathways in a variety of disease models. She has been passionate about translational research throughout the years, and wishes to pursue a career as a clinician-scientist in academia in the future.



Project Synopsis

The biology behind orthodontic tooth movement (OTM) is extremely complex yet very crucial to be understood by clinicians. A thorough knowledge of the biological responses involved in OTM would provide clinicians with the ability to better determine prognoses and the occurrence of orthodontically induced inflammatory root resorption, as well as elucidate the etiology of post-treatment relapse. Additionally, understanding the dynamics of remodeling pathways will also help clinicians to design more effective appliances which could target specific cells for a controlled and safe acceleration of tooth movement. However, despite the extensive studies in this area, our knowledge of OTM at the molecular level remains far from complete. This could be due to the limitation of traditional molecular biology techniques, which only focus on one or several molecules at a time and cannot describe the impact of aberrant or modulated molecular environments across a whole system. Advanced technology and approaches such as Next Generation Sequencing will certainly expand the discovery of biology of OTM to a more broadened level. The aim of this study is to determine global dynamic changes in gene expression using RNA sequencing approach to assess the biological effects of OTM on the PDL and alveolar bone in a rat model.

Importance of AAOF Funding

The AAOF RAA is essential to this project by assisting in the funding and support, especially in conducting the costly RNA sequencing studies. The AAOF is also instrumental in helping Dr. Liu with her academic career by providing extensive experience needed to become an independent investigator.