



**Dr. Lara Moyu Fu**  
**2026 Research Aid Award**  
**University of Washington School of Dentistry**

### **1. Brief Biography**

I am a second-year orthodontic resident at the University of Washington School of Dentistry, Department of Orthodontics (Class of 2027), pursuing a Master of Science in Dentistry alongside my clinical training. I earned my DDS from UCSF, where I developed an early commitment to evidence-based orthodontics through animal orthodontic models — e.g., a project on calcium phosphate nanoclusters that modify periodontal remodeling and minimize orthodontic relapse, with Dr. Sunil Kapila, published in *Biomaterials*. My long-term goal is to become a clinician-scientist in academic orthodontics, combining patient care with translational research that refines how we plan and execute tooth movement. My current thesis work, mentored by Dr. Greg Huag, Chair of UW Orthodontics, focuses on the three-dimensional alveolar bone response to maxillary incisor retraction — a question that sits at the intersection of biomechanics, biology, and imaging.

### **2. Brief Description of the Project**

Title: Alveolar Bone Response to Maxillary Incisor Retraction in Growing and Non-Growing Individuals — A Retrospective CBCT Study.

Premolar-extraction camouflage treatment is a mainstay for correcting maxillary and bimaxillary protrusion, yet a century-old question remains unresolved: do teeth move with their alveolar housing, or through it? Two-dimensional cephalograms cannot answer this question, and prior CBCT studies are limited by small sample sizes, inconsistent methods, and limited attention to skeletal maturity. Using de-identified pre-treatment, post-treatment, and post-retention CBCT scans from collaborating clinics in the greater Seattle area and South Korea, this study will (1) develop and validate a voxel-based CBCT superimposition method for evaluating maxillary tooth movement and bone remodeling, (2) compare buccal and palatal alveolar bone height and thickness changes between growing and non-growing patients treated with premolar extraction, and (3) characterize cortical bone remodeling during the retention phase. Outcomes include labial and palatal bone width at 3 mm and 6 mm below the CEJ, bone height, and cephalometric changes, measured by two calibrated examiners under the supervision of a board-certified oral and maxillofacial radiologist.

### **3. How Orthodontic Education Will Benefit from This Award**

Findings will give residents and faculty a more rigorous, three-dimensional basis for treatment-planning decisions about extraction, the magnitude and direction of incisor retraction, and the use of skeletal anchorage — particularly when patient age and growth status alter the biological envelope of safe tooth movement. The validated CBCT superimposition workflow can be adopted as a teaching tool in graduate orthodontic imaging and biomechanics curricula. Results will be disseminated through a master's thesis, peer-reviewed publication, and presentations at AAO and IADR meetings, and the project will provide formal mentored research training for a co-investigator from the oral and maxillofacial radiology residency — directly investing in the next generation of orthodontic educators and researchers.

### **4. Why the Foundation Is Important to This Project**

AAOF support is essential to making this study scientifically defensible. Award funds will underwrite professional statistical consultation through the University of Washington and licensing for the CBCT analysis software required for voxel-based superimposition and bone measurement — resources that are not covered by my residency program. Beyond the budget, AAOF endorsement signals to clinical collaborators who supply CBCT data and to journals reviewing the eventual manuscript that the work meets the specialty's standard for thoughtful, well-mentored resident research. Without the Foundation, I would have to either narrow the project's scope or rely on less rigorous analytical methods, both of which would weaken its contribution to the field.

### **5. How Foundation Funding Will Benefit My Career**

As a first-time AAOF applicant committed to an academic clinician-scientist career, this award would be a formative early milestone. It will let me complete a methodologically sound thesis, generate first-author publications and national presentations, and build a track record of externally funded, peer-reviewed work — the foundation needed to compete for faculty positions and future NIH or AAOF Biomedical Research Awards. Equally important, participation in the AAOF community will connect me with mentors and peers across the specialty, helping me develop into an orthodontist who continues to give back to the profession through teaching, research, and service long after residency.