Research Aid Award
Dr. Grace Lee, University of Pennsylvania
2021 Charles J. Burstone Research Aid Award

Biography

Dr. Grace Lee is a second-year resident and Master of Science in Oral Biology candidate in the Department of Orthodontics at the University of Pennsylvania, School of Dental Medicine. She completed her training and received her D.D.S. degree at Paris Descartes University in France.

Five months into residency, she attended a lecture by Dr. Hyun-duck Nah on her current project to decrypt the genetical involvements in the development of cleft lip and palate (CL/P). The scope and future perspectives of the project were extremely encouraging and exciting because of the life-changing impact that it would have on CL/P patients. She joined Dr. Nah's team because she wanted to get involved in a basic science research project that had high clinical relevance for orthodontic patients.

Project Description

This research project is part of a broader project for which the goal is to better understand the complex molecular processes of gene regulation, splicing programs, and signaling pathways involved in CL/P physiopathology. Previous data from Dr. Nah's team has shown that cleft lip caused by the knockout of the Esrp1-/- in mouse embryos is rescued by Sox2 haploinsufficiency in a double transgenic mouse (Esrp1-/-; Sox2+/-). This rescue model provides a unique opportunity for narrowing down the field of Esrp1 targets that are critical in the upper lip formation.

With the Esrp1-/- model for CL/P and double transgenic (Esrp1-/-; Sox2+/-) rescue model, the goal of this study is the comparative transcriptomic analysis of three mouse strains (Esrp1KO, Wild Type, Rescued) to identify Esrp1 targets in the developing facial prominences, which are potentially responsible for CL/P formation. Outcomes of this study will form the basis for future investigation into individual candidate genes/RNAs for their roles in CL/P formation as well as their potential as therapeutic targets.

Importance of AAOF

Most of the funding by the AAOF will be used to sequence RNA samples, which is costly. This will help identify potential target genes and lay the groundwork for developing innovative therapies for cleft patients. Dr. Lee thanks the AAOF for its support for this project and the development of her future academic career in orthodontics.