



2025 Research Aid Award Dr. Erin Malone, University of California-San Francisco

Biography

Dr. Erin Malone DDS, PhD is a rising 3rd Year Postdoctoral Orthodontic Resident at the University of California-San Francisco (UCSF). Dr. Malone attended Tennessee State University where he graduated with a bachelor's degree in general biology. He had the distinct opportunity to train as an Oral and Craniofacial clinician scientist and graduate in a dual-degree program obtaining his DDS and PhD in Oral and Craniofacial Sciences. His PhD research focused on characterizing microbial-host interactions that lead to periodontal disease. During his dual degree education, he was awarded two NIH-funded grants, IMSD and an F30.

Upon graduation Dr. Malone matriculated into the UCSF Orthodontic program. He currently is developing his craft in diagnosing malocclusions, treatment planning, and working alongside patients with craniofacial anomalies. Dr. Malone's current research project is investigating the role of ubiquitinases in the developing craniofacial complex and identifying phenotypic characteristics. Future goals include practicing, teaching, research and mentoring as a clinician scientist either privately or at an academic institution.

Description of the project

Many instances of dysfunction and poor regulation of neural crest cells have been diagnosed and grouped by the term neurocristopathy. This group accounts for one third of the defects in children with birth defects. These anomalies consist of malformations in the head and face including cleft lip, cleft palate, small or absent facial and skull bones and improperly formed nose, eyes, ears, and teeth.

In literature, approximately 9 human variants of the E3 ubiquitin ligase NEDD4L have been found in humans to act on numerous organs developed by the mesenchyme controlled by neural crest cell regulation and migration. Additionally, a phenotype of retrognathic mandible, malformed premaxilla, a cleft or poorly developed palatal bone, and a failure of lip or nasal fusion have been identified in these patients.

This study aims to investigate the role of NEDD4L in developing these structures and identify the genetic phenotype as an influencer of neurocristopathies. The objective of this study is to identify the localization and function of NEDD4L in chick embryo development and determine its necessity in neural crest cells to normal development in the craniofacial complex. We plan to develop a chick model to help identify the role of normal and mutated expressions of NEDD4L.

Statement of how your orthodontic education will benefit from your award

With access to this award, I can conduct orthodontic research that aligns with my personal interests. I have a large interest in working in underserved communities and providing orthodontic care to disadvantaged populations in an academic and clinical setting. Many times, craniofacially compromised patients are the beneficiaries of resources from these populations. I believe my research will continue to shed light on new targets that may not be in traditional genetic testing panels and potentially identify new clinical characteristics.

Why the Foundation is important to your project

I believe the foundation is important to this project because, they strive to fund research that will continue to push the orthodontic field forward. Success of this proposal can provide evidence for further investigation in the role of NEDD4L in human development and potentially identify a target for craniofacial anomalies. Research is propelled forward many times by preliminary studies of exploration. These studies need financial support to progress and the research aid definitely play that role in my project.

How Foundation funding is expected to or has benefitted your career

Foundation funding has benefitted me personally by providing an avenue to grow and develop as a resident. Performing research is an instrumental part of my education. I have had the ability to learn cutting edge research techniques at an organism and genetic level that I hope to use in future studies. I wish to use the results from this research as a preliminary study for future grant submissions such as a K08. As an aspiring clinician scientist, it is imperative to have substantive data and continued research to maintain future resources. The AAOF Research Aid will be instrumental in helping me progress through my career.