

Biomedical Research Award

Dr. Christina Nicholas, *University of Illinois at Chicago*

Dr. Christina Nicholas is a biological anthropologist and dental researcher whose primary interest lies in addressing questions related to variation in patterns of craniofacial growth and development. Dr. Nicholas received her PhD in Anthropology from the University of Iowa in 2015, after which she trained as a postdoctoral scholar under Drs. Thomas Southard and Lina Moreno at the Iowa Institute for Oral Health Research. She is currently a Visiting Research Assistant Professor in the Department of Orthodontics at the University of Illinois at Chicago. Dr. Nicholas is involved in both pre-doctoral and post-doctoral teaching, including directing the Department of Orthodontics' Craniofacial Growth and Development course.



The AAOF-funded Biomedical Research Award project, “Childhood obesity, oral inflammation, and timing of dental development”, looks at the role of childhood obesity in influencing craniodental development and oral health. Research suggests that high BMI (body mass index) children develop and erupt their teeth at younger chronological ages than their normal-weight counterparts. Furthermore, there is some indication that obese children may have a greater amount of oral inflammation. However, we currently know very little about either the mechanism for early dental development or the overall effects of childhood obesity on dentofacial growth. In this study, we will compare timing of dental development (e.g., early, delayed) and levels of oral inflammation in obese and normal-weight children. We anticipate that normal-weight children will have higher levels of pro-inflammatory biomarkers and biomarkers for hard tissue breakdown than their normal-weight peers. We further anticipate that obese children will, on average, have accelerated dental development. We hypothesize that obesity’s role in promoting both systemic and local inflammation may influence timing of dental development and eruption in overweight and obese children (based upon the fact that, at a molecular level, inflammatory cytokines play a key role in tooth eruption). We will further collect dietary information from our study participants, to examine whether diet is a covariate (or confounder).

Orthodontic education will benefit from the results of this project, as it will help to illuminate potential oral health implications of childhood obesity. Given the prevalence of high BMI among contemporary patient populations, it is important for future orthodontists to understand what additional considerations may need to be given to these patients. The AAOF is critical in funding this research, as it is an exploratory project in an under-studied area of orthodontic treatment and oral health. The AAOF is an important source of funding for orthodontic research, and particularly in supporting young investigators. The PI is a junior scholar who is developing her career as an orthodontic researcher, and thus will benefit greatly from the AAOF’s investment in her research career development through the funding of this project. The AAOF BRA award will allow her to greatly expand her research in this area, providing key pilot data for future grant applications.