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Organ on a Chip Platforms for Dental, Oral, and Craniofacial Diseases

Alexandria, VA – A symposium exploring the applications of next-generation organ-on-a-chip (OoC) technology in dental, oral, and craniofacial (DOC) research was presented at the 54th Annual Meeting of the AADOCR, which was held in conjunction with the 49th Annual Meeting of the Canadian Association for Dental Research, on March 12-15, 2025 in New York, NY.

This symposium explored the applications of OoC technology in DOC research. Current treatments for DOC diseases rely on animal models, which often fail to predict drug efficacy accurately due to species differences. Additionally, traditional 2D models do not effectively capture the complex multicellular mechanisms involved in DOC diseases. There is a pressing need to overcome these challenges by developing innovative in vitro platforms that offer advanced diagnostic and therapeutic capabilities.

Organ-on-a-chip technology provides promising new preclinical models through 3D microfluidic devices that mimic multicellular structures, tissue interfaces, and the dynamic microenvironments of DOC tissues in both healthy and diseased states. These platforms can help uncover new biochemical, genetic, and metabolic activities of living cells, potentially leading to the identification of novel targets for DOC diseases. This approach could transform the development of targeted therapies for individual patients and specific genetic subpopulations, ultimately revolutionizing the design of clinical trials for DOC conditions.

Organized by Stella Alimperti of Georgetown University, Washington, D.C., the symposium, “Organ on a Chip Platforms for Dental, Oral, and Craniofacial Diseases” took place on Wednesday, March 12 at 1:30 p.m. Eastern Time (UTC-4).

About AADOCR

The American Association for Dental, Oral, and Craniofacial Research is a nonprofit organization with a mission to drive dental, oral, and craniofacial research to advance health and well-being. AADOCR represents the individual scientists, clinician-scientists, dental professionals, and students based in academic, government, non-profit and private-sector institutions who share our mission. AADOCR is the largest division of the International Association for Dental, Oral, and Craniofacial Research. Learn more at www.aadocr.org.