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## **Tissue-on-a-Chip Platforms for Dental, Oral, and Craniofacial Diseases**

**Alexandria, VA, USA** – A symposium exploring the utility of next-generation organ-on-a-chip technology in dental, oral, and craniofacial research was presented at the 104<sup>th</sup> General Session of the IADR, which was held in conjunction with the 55<sup>th</sup> Annual Meeting of the American Association for Dental, Oral, and Craniofacial Research and the 50<sup>th</sup> Annual Meeting of the Canadian Association for Dental Research on March 25-28, 2026 in San Diego, CA, USA.

“Tissue-on-a-Chip” or “Organ-on-a-Chip” platforms are human-relevant, *in-vitro* platforms designed to mimic key structural, anatomical, physiological, and/or pathological features of tissues. They are microfluidic systems with controlled fluid flow and mechanical cues that recreate microphysiological features and tissue interfaces, such as tooth-, gingiva-, bone-, or oral mucositis-on-chip. These emerging models are increasingly recognized by regulatory agencies and used to benchmark efficacy and safety against clinical standards, thereby complementing or replacing animal studies while improving translational relevance and ethical practice.

Current dental, oral, and craniofacial (DOC) therapeutics rely heavily on animal models, which often fail to predict drug efficacy due to fundamental interspecies differences. Likewise, traditional 2D culture systems lack the complexity needed to capture the multicellular interactions that drive DOC disease progression. To address these limitations, advanced *in-vitro* platforms, including organ-on-a-chip systems, organoids, and microfluidic devices, are being developed as powerful preclinical models. These microphysiological systems can replicate multicellular architecture, tissue–tissue interfaces, physicochemical microenvironments, and dynamic fluid perfusion under both healthy and diseased conditions. This symposium highlighted the emerging applications of next-generation organ-on-a-chip (OoC) technology in DOC research.

Organized by Stella Alimperti, Georgetown University, Washington, DC, USA; Gopu Sriram, National University of Singapore, and Cristiane Franca, Oregon Health and Science University, Portland, USA, the symposium, “Tissue on a Chip Platforms for Dental, Oral, and Craniofacial Diseases” took place on Saturday, March 28 at 8 a.m. PDT (UTC-7).

### **About IADR/AADOOCR**

The International Association for Dental, Oral, and Craniofacial Research (IADR) is a nonprofit organization with a mission to drive dental, oral, and craniofacial research for health and well-being worldwide. IADR represents the individual scientists, clinician-scientists, dental professionals, and students based in academic, government, non-profit, and private-sector institutions who share our mission. The American Association for Dental, Oral, and Craniofacial Research (AADOOCR) is the largest division of IADR. Learn more at [www.iadr.org](http://www.iadr.org).

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