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CONTACT:
Matt Niner
+1.703.299.8084
media@iadr.org

The Hidden Cost of E-Cigarette Usage: How Vaping Reshapes Oral Microbiome

Alexandria, VA, USA – A symposium on the intersection of electronic nicotine delivery systems use, oral microbiome dynamics, and host immune responses was presented at the 104th General Session of the IADR, which was held in conjunction with the 55th Annual Meeting of the American Association for Dental, Oral, and Craniofacial Research and the 50th Annual Meeting of the Canadian Association for Dental Research on March 25-28, 2026 in San Diego, CA, USA.

The rapid rise in electronic nicotine delivery systems (ENDS) or e-cigarette use, also known as vaping, particularly among adolescents and young adults, has garnered significant attention over the past decade. Promoted as safer alternatives to traditional tobacco products and advertised for smoking cessation, ENDS are often perceived as less harmful. However, growing evidence links vaping to adverse health outcomes, affecting not only the respiratory and cardiovascular systems but increasingly, the oral cavity.

As the first point of contact with inhaled aerosols, the oral cavity is uniquely vulnerable to the effects of vaping. Exposure can lead to oxidative stress, epithelial barrier damage, and chronic inflammation. Clinical studies have reported associations between ENDS use and gingival inflammation, increased plaque accumulation, and a heightened risk of periodontal disease. Central to these effects is the oral microbiome, which plays a pivotal role in modulating host immune responses. Microbial shifts, especially the enrichment of periopathogenic taxa and depletion of commensal species, are often noted in long-term ENDS users, which may promote dysbiosis, gingivitis, and periodontitis.

This session highlighted emerging research on the intersection of vaping, oral microbiome dynamics, and host immune responses. Experts across multiple disciplines, including exposure science, molecular toxicology, clinical dentistry, and epidemiology, shared new findings that clarified how ENDS use contributes to oral disease risk through reshaping the oral microbiome. Attendees gained a deeper understanding of the biological mechanisms underlying vaping-related oral health effects and explore critical gaps in knowledge needed to inform regulatory policy, disease prevention strategies, and evidence-based clinical guidelines.

Organized by Xiaojia He, Chemical Insights Research Institute, Marietta, GA, USA, the symposium, “The Hidden Cost of E-Cigarette Usage: How Vaping Reshapes Oral Microbiome” took place on Thursday, March 26 at 8 a.m. PDT (UTC-7).

About IADR/AADOCR
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 (AADOCR) is the largest division of IADR. Learn more at www.iadr.org.