FOR IMMEDIATE RELEASE
March 28, 2026

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Nanozyme-Stabilized SnF2 Enables Low-Dose, High-Precision Caries Prevention Without Systemic Effects

Alexandria, VA, USA – A study seeking to enable greater therapeutic outcomes at lower fluoride concentrations 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.

While fluoride remains the gold standard for caries prevention, it is often ineffective in high-risk populations, where cariogenic biofilms flourish due to sugar-rich diets and poor oral hygiene. Enhancing fluoride efficacy without increasing exposure remains a key challenge. To address this, investigators developed a strategy based on a nanozyme (an enzyme-like nanomaterial) employing Feraheme (Fer-NZM) that stabilizes stannous fluoride (SnF2), enabling greater therapeutic outcomes at lower fluoride concentrations. This formulation offers potent caries protection without disturbing the oral microbiome or inducing systemic effects. Investigators also elucidate the underlying mechanism by which nanozyme-SnF2 interactions enhance catalytic activity, maintain SnF2 bioavailability, and prevent caries via a simple aqueous delivery system

The study uncovered a novel nanozyme-tin complexation mechanism that enables a highly effective and safe approach for caries prevention. By combining traditional fluoride with an FDA-approved nano-catalyst, this synergistic therapy represents a next-generation fluoride treatment that is precise, effective, and especially suited for those at highest risk of dental caries.

The abstract, “Nanozyme-Stabilized SnF2 Enables Low-Dose, High-Precision Caries Prevention Without Systemic Effects” was presented by Nil Pandey of University of Pennsylvania, Philadelphia, USA during the “Tech-powered Innovations in Caries Microbiology and Therapeutic Development” Oral Session that took place on Saturday, March 28, 2026 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.