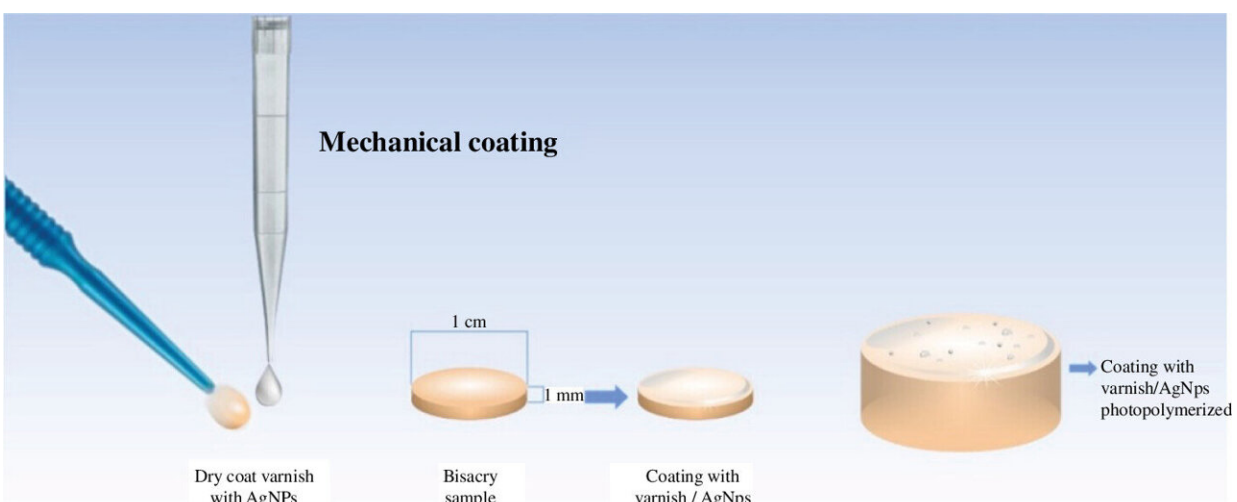


Scientists design silver nanoparticle–based self-hygienic resin for use in dental applications

October 3 2024, by Ravichandran Manisekaran



Silver nanoparticle deposition on to the restorative resin using mechanical coating for the inhibition of amicrobial biofilm. Credit: Dr Ravichandran Manisekaran

The oral cavity is home to a rich ecosystem of microorganisms that are found in both healthy and diseased states. In the area of dental restoration, highly specialized materials are used to fulfill specific functions so that the patient recovers their dental structures, masticatory and phonetic functions and even enjoys improved aesthetics.

These materials allow commensal microorganisms to adhere and grow on [rough surfaces](#), forming biofilms that are resistant to the oral environment and hygienic conditions. Thus, over time, these bacteria can corrode the material, create structural and color changes, or even cause infections, such as gingivitis or prosthetic stomatitis. Therefore, the addition of self-hygienic properties to prevent microbial colonization is necessary to maintain the oral ecosystem.

Silver nanoparticles (AgNPs) are widely used in research for their antimicrobial, optical, and [electrical properties](#), and are widely used in the cosmetic, biomedical, packaging, and other industries.

In recently published [research](#) in *Royal Society Open Science*, researchers from the Interdisciplinary Research Laboratory (LII) of ENES Leon, UNAM, designed a method to incorporate AgNPs onto the surface of composite resins used for provisional dental restorations to inhibit the bacterial growth of early colonizers in the [oral cavity](#).

"Our method inhibits the formation of biofilm by allowing the silver to remain on the resin surface for a long duration with a sustained release of silver ions, without affecting the [fibroblast cells](#) evaluated in this study and provides antiseptic activity in provisional restorations like bisacrylic resin," says Verónica Campos-Ibarra, postdoctoral researcher at ENES Leon, UNAM and Professor at the School of Stomatology, UASLP in San Luis Potosí.

Ravichandran Manisekaran, research professor and coordinator of the Nanostructures and Biomaterials lab said that the researchers used a mechanical coating method with a concentration of

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