



Hydrophobic Surfaces for Tooth Tissues

IP Status: Pending US Patent; **Application #:** 15/629,430

Amphipathic Molecules Create Hydrophobic Dental Surface

A highly hydrophobic dental surface coats teeth tissues (enamel, dentin, and cementum) to prepare them for esthetic dental restorations. The anti-microbial coating, created from amphiphilic molecules, acts as an interface between etched dentin and/or enamel and dental composite and protects dental restorations against degradation from water, acid, and enzymes. In addition, it offers anti-biofilm properties at the tissue/restoration interface and may even bond directly to the composite, thus eliminating the need for bonding agents and reducing the number of steps for the procedure.

Protects Dental Restoration

The interface between a tooth and a restoration often fails, leading to secondary caries, restoration and/or tooth fracture, and, ultimately, restoration replacement. Replacing failed dental restorations occupies up to 70% of a dentist's time. Current technologies to prevent such failures are time consuming and prone to failure due to mastication, hydrolysis, temperature changes, and bacteria biofilm attacks (including acid and enzymatic production). The highly hydrophobic interface in this technology prevents such failures by offering protection against water-mediated degradation and biofilm growth.

BENEFITS AND FEATURES:

- Protects dental restorations against degradation from water, acid, and enzymes
- Anti-microbial coating prevents biofilm growth
- Created with amphiphilic molecules
- Prevents penetration of acidic and other water-based degrading agents, even after extended saliva exposure
- May bond directly to composites, eliminating bonding agents and reducing procedure time/effort

APPLICATIONS:

- Preparing teeth tissues for esthetic dental restorations
- Restoring teeth with caries; cosmetic restoration
- May prevent microbial growth on dental surfaces and implants
- Could be adapted for applying to orthodontic appliances

Phase of Development - Proof of Concept

Researchers

Conrado Aparicio, PhD, MSc Eng
Associate Professor, Restorative Sciences
[External Link](http://www.dentistry.umn.edu) (www.dentistry.umn.edu)
Alex Fok, PhD, MSc
Professor, Restorative Sciences
[External Link](http://www.dentistry.umn.edu) (www.dentistry.umn.edu)
William H. Douglas, BDS, MS, PhD

Technology ID

20160093

Category

Life Sciences/Human Health
Life Sciences/Medical Devices
Agriculture &
Veterinary/Veterinary Medicine

Learn more



Professor Emeritus, Department of Restorative Sciences

[External Link](http://www.dentistry.umn.edu) (www.dentistry.umn.edu)