



# Novel Surface Treatment for Dental Materials

## Available for Exclusive Licensing

### Dental Applications:

- Composites
- Crowns / Bridges
- Implants

Researchers at RTI International have developed a novel surface modification for biomedical metal oxides that promotes enhanced adhesion and antimicrobial properties. It has been well established that a reliable bond between metal oxides (specifically zirconia) and other biomedical materials has been both difficult and inconsistent. Surface abrasion for increased micromechanical attachment and chemical treatments have demonstrated marginal success. Additionally, the reduction of amalgam restorations, coupled with the suboptimal short lifetimes of the composite replacements, has led researchers to develop novel composites with amalgam-like properties.

This scalable surface treatment allows for inert materials to be functionalized without the need of primers, embedded particles, or deposited films. Our work has focused on dental materials (e.g., crowns, bridges, composites) to improve adhesion and promote antimicrobial behavior, but this technology can be applied to different areas where surface properties need to be tailored for specific applications. These results have been tested in vitro and have been published in numerous peer-reviewed literature.

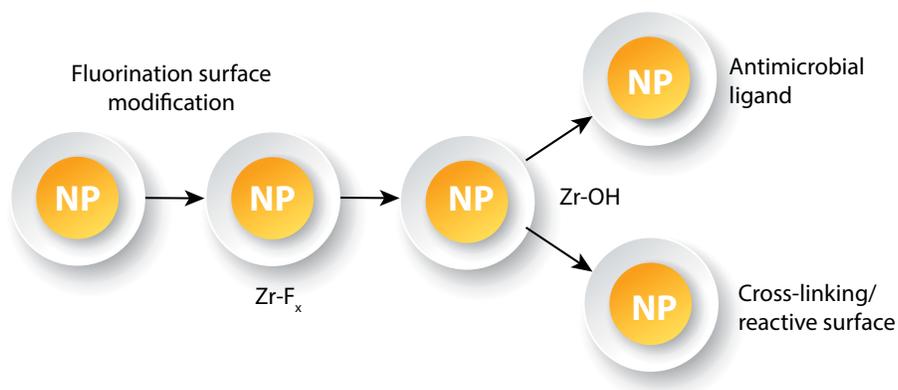
### Advantages

- Stable modification that does not compromise bulk material properties
- Surfaces that are highly wettable, having aqueous contact angles of less than 10 degrees, which can be further functionalized
- Application-specific functionalization (i.e., surface chemistries can be modified to meet a specific need)
- Facilitates long-term efficacy of restorations

Examples of specific applications include the following:

- Development of a dental composite displaying enhanced particle/matrix adhesion
- Antimicrobial properties
- Multiple antimicrobial surface functionalization platforms.

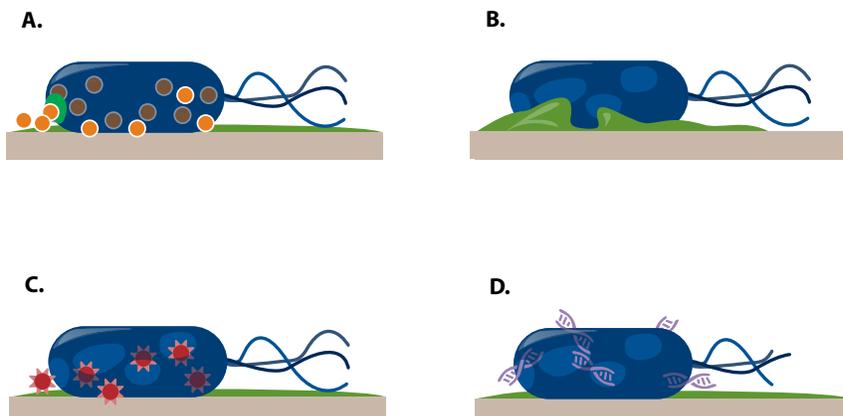
## Antimicrobial Composite



## Antimicrobial Surface

Platform chemistry enables a range of antimicrobial mechanisms:

- A. Repel microbes
- B. Low surface energy enabling easy removal of biofilm with shear
- C. Kill microbes in vicinity via leaching ions
- D. Kill microbes on contact via tethered polymers
- E. Multidimensional platform (two or more of the above.)



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## More Information

To discuss licensing or to speak with the inventors of this patented and patent-pending invention, please contact **Kevin Boggs** at 919.248.4140 or [licensing@rti.org](mailto:licensing@rti.org).