A NOVEL ANTIBACTERIAL RESIN COMPOSITE CONTAINING QUATERNARY AMMONIUM SALTS

Leah Howard, Yiming Weng, Xia Guo, Voon Joe Chong,
Richard L. Gregory[1], and Dong Xie, Department of Biomedical Engineering, Purdue School of Engineering and Technology,
Indiana University–Purdue University Indianapolis, Indianapolis, Indiana 46202

Objectives: The objective of this study was to synthesize new quaternary ammonium bromide (QAB)-containing oligomers, incorporate them to dental resin composites, and evaluate the effects of these new oligomers on the mechanical strength and antibacterial activity of the formed composites. **Methods:** The novel quaternary ammonium bromide (QAB)-containing oligomers were synthesized and applied for developing an antibacterial resin composite. Compressive strength (CS) and S. mutans (an oral bacteria strain) viability were used to evaluate the mechanical strength and antibacterial activity of the formed composites. **Results:** All the QAB-modified resin composites showed significant antibacterial activity and mechanical strength reduction. Increasing chain length and loading significantly enhanced the antibacterial activity but dramatically reduced the CS. The 30-day aging study showed that the incorporation of the QAB accelerated the degradation of the composite, suggesting that the QAB may not be well suitable for development of antibacterial dental resin composites or at least the QAB loading should be well controlled, unlike its use in dental glass-ionomer cements. **Conclusions:** The work in this study is beneficial and valuable to those who are interested in studying antibacterial dental resin composites.

[1]Department of Oral Biology, School of Dentistry, Indiana University, Indianapolis, Indiana 46202

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