

**Surface properties and in vitro *Streptococcus mutans* adhesion to dental resin polymers.**

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**Objectives** This study aimed to characterize the surface properties of experimental resin polymers consisting of monomers differing in functionality and chain length, and to evaluate differences in *Streptococcus mutans* adhesion. **Material and Methods** Six resins were prepared (70/30 ratio UDMA/monomer); camphorquinone and ethyl-4-dimethylaminebenzoate were added for light activation. A conventional composite was used as a control. Surface free energy was determined prior and after saliva exposition (2 h, 37 degrees C). After saliva incubation (2 h, 37 degrees C), specimens were incubated with *Streptococcus mutans* NCTC 10449 for 2.5 h at 37 degrees C. Adherent bacteria were quantified by determining the relative substratum area covered by bacteria using SEM analysis, and by using a fluorometric assay for viable cell quantification. **Results** No statistically significant differences in total surface free energies were found for uncoated specimens (mean total surface free energies ranging from 39.79 to 49.73 mJ/m<sup>-2</sup>); after saliva coating, statistically significant differences were observed for some of the polymers (mean total surface free energies ranging from 44.13 to 65.81 mJ/m<sup>-2</sup>). Few differences were observed between SEM and fluorescence quantification, finding statistically significant differences in streptococcal adhesion to the experimental polymers. Median bacteria surface coverage ranged from 1.4% for UDMA mixed with 1,10-decandiol dimethacrylate to 16.2% for the control composite material; lowest fluorescence intensities indicating lowest adhesion of bacteria were found for UDMA mixed with 1,10-decandiol dimethacrylate (median 712), and highest values indicating highest adhesion of bacteria were found for UDMA mixed with polyethyleneglycol (600) dimethacrylate (median 11974). **Conclusion** *Streptococcus mutans* adhesion appears to be different on polymers differing in monomer mixtures, yet correlations between substratum surface free energy and streptococcal adhesion were poor. Further studies are necessary to evaluate additional substratum surface properties and pellicle distribution and composition more thoroughly.

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