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# Photodynamic inactivation (PDI) over cariogenic biofilm using photosensitizers based on curcumin (Conference Presentation)

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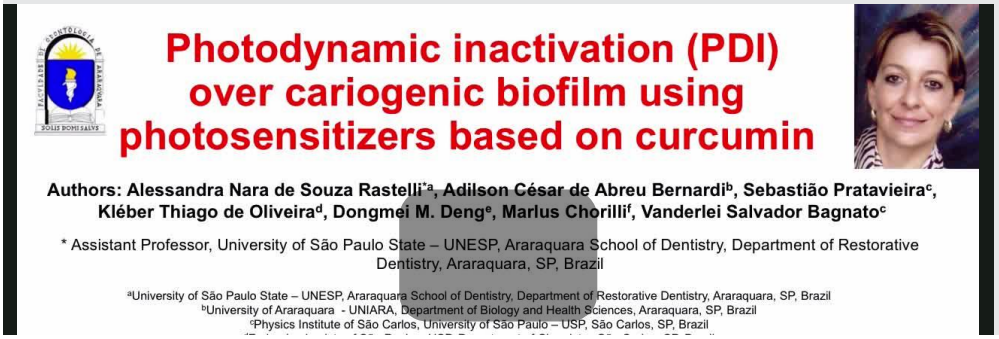
## Abstract

Dental caries is an infectious disease caused by acidogenic bacteria. Effective removal and/or inactivation of the cariogenic biofilm is crucial for the prevention and treatment of dental caries. Thus, the purpose of this study was to evaluate the susceptibility of S. mutans biofilm to photodynamic inactivation using two photosensitizers based on curcumin. Suspensions of S. mutans were exposed to LED at 440nm (BioTable®) under 36.1mW, 15J/cm2 and 5 min of pre-irradiation time with synthetic and commercial curcumin at different concentrations (160, 80, 40, 20, 10, 5, 2.5, 1.25, 0625 and 0.3μM) to determine minimum inhibitory (MIC) and minimum bactericidal concentrations (MBC). After that, biofilm was induced for 7 days over hydroxyapatite discs (5mmx1.8mm). Serial dilutions were seeded onto BHI agar to determine viability by CFU/mL. Additionally, confocal laser scanning microscopy (CLSM) was performed using LIVE/DEAD® BacLight™ system to the distribution of non-viable viable/cells. Different Groups were analyzed: L-D- (negative control), L-D+ (drug Group), L+D- (light Group), L+D+ (PDI Group) and chlorhexidine at 0.2% (positive control). In addition, the mechanisms involved were determined before and after irradiation by absorption and fluorescence spectra. The results were analyzed by two-way ANOVA and Tukey's test ($p<0.05$). Statistically significant difference in all PDI and chlorhexidine Groups compared to negative control and light Group ($p<0.05$) was observed. For the dark cytotoxicity, no significant difference was observed compared to the negative control Group ($p>0.05$). Photodynamic inactivation using curcumin can be an adjunct and effective method to control Streptococcus mutans biofilm responsible to dental caries.

## Conference Presentation



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