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**Disinfection of *Streptococcus mutans* Biofilm by a Non-Thermal Atmospheric Plasma Brush** QING HONG, XIAOQING DONG, Department of Mechanical and Aerospace Engineering, University of Missouri, Columbia, MO, USA, MENG CHEN, Nanova, Inc., Columbia, MO, USA, YUANXI XU, HONGMIN SUN, Department of Internal Medicine, University of Missouri, Columbia, MO, USA, LIANG HONG, Department of Pediatric and Community Dentistry, College of Dentistry, the University of Tennessee Health Science Center, Memphis, TN, USA, QINGSONG YU, Department of Mechanical and Aerospace Engineering, University of Missouri, Columbia, MO 65211, USA — This study investigated the argon plasma treatment effect on disinfecting dental biofilm by using an atmospheric pressure plasma brush. *S. mutans* biofilms were developed for 3 days on the surfaces of hydroxyapatite discs, which were used to simulate human tooth enamel. After plasma treatment, cell viability in the *S. mutans* biofilms was characterized by using MTT assay and confocal laser scanning microscopy (CLSM). Compared with the untreated control group, about 90% and 95% bacterial reduction in the biofilms was observed after 1 and 5 min plasma treatment, respectively. Scanning electron microscopy examination indicated severe cell damages occurred on the top surface of the plasma treated biofilms. CLSM showed that plasma treatment was effective as deep as 20  $\mu\text{m}$  into the biofilms. When combined with 0.2% chlorhexidine digluconate solution, the plasma treatment became more effective and over 96% bacterial reduction was observed with 1 min plasma treatment. These results indicate that plasma treatment is effective and promising in dental biofilm disinfection.

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