

Plasma needle treatment of *Staphylococcus Aureus* (ATCC 25923) biofilms

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New atmospheric pressure plasma sources opened a wide range of biomedical applications, such as sterilization of wounds and medical equipment, treatment of dental caries, faster coagulation of blood, etc. In this paper we will present results obtained in plasma treatment of formed and unformed (MRSA) biofilms. Plasma source used for these treatments was plasma needle that was previously used in treatments of planctonic samples containing bacteria [1]. Treatments were carried out on unformed biofilm for three different powers, two different flow rates of helium (0.5 and 1 slm) and several treatment times (10, 30, 60 and 120 s). The mean power was calculated and it did not exceed 2 W in all treatments (which in our experience does not heat the substrate by more than 6-7 degrees). Figure 1. shows comparison of absorbance after treated samples were allowed sufficient time to develop the fully formed biofilm. We can see that the longer exposure times and higher transmitted power to the plasma reduced biofilm production. Plasma treatment is more efficient on unformed than on formed biofilm. For presentation of results we used four categories of biofilm production: no biofilm, weak, medium and strong biofilm [2].

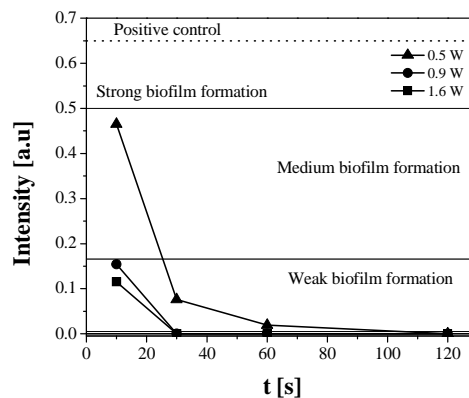


Figure 1: Optical density absorbances of biofilm formation after plasma treatment of the biofilm during formation for three different applied powers. The initial concentration of unformed biofilm was 10^6 CFU/ml and flow of working gas was 1 slm.

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References

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