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Destruction of Bacterial Biofilms Using Gas Discharge Plasma NINA ABRAMZON, JONATHAN C. JOAQUIN, JONATHAN BRAY, GRACIELA BRELLES-MARIÑO, California State Polytechnic University, Pomona — Biofilms are bacterial communities embedded in an exopolysaccharidic matrix with a complex architectural structure. Bacteria in biofilms show different properties from those in free life thus, conventional methods of killing bacteria are often ineffective with biofilms. The use of plasmas potentially offers an alternative to conventional sterilization methods since plasmas contain a mixture of charged particles, chemically reactive species, and UV radiation. 4 and 7 day-old biofilms were produced using two bacterial species: *Rhizobium gallicum* and *Chromobacterium violaceum*. Gas discharge plasma was produced by using an AtomfloTM reactor (Surfx Technologies) and bacterial biofilms were exposed to it for different periods of time. Our results show that a 10-minute plasma treatment was able to kill 100% of the cells in most cases. Optical emission spectroscopy was used to study plasma composition which is then correlated with the effectiveness of killing. These results indicate the potentiality of plasma as an alternative sterilization method.

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