

EXECUTIVE SUMMARY [NON-CONFIDENTIAL, NON-TECHNICAL ABSTRACT FOR PUBLIC INFORMATION OR PROGRAM PROMOTION]:

Bacteria and bacterial biofilms on surfaces cost the nation billions of dollars yearly in equipment damage, product contamination, energy losses and medical infections. Biofilms are responsible for diseases such as otitis media and play a role in cystic fibrosis and Legionnaire's disease among others. Biofilms commonly colonize many household surfaces, including toilets, sinks, countertops and cutting boards, they cause pipe plugging, corrosion and water contamination in industries. Conventional methods of killing bacteria (such as antibiotics, sterilization by heat, sterilization by chemical processes and UV radiation) are often limited and ineffective with bacterial biofilms. The use of the plasmas offers a very effective alternative to conventional sterilization methods as plasmas contain a mixture of charged particles (ions, electron), chemically reactive species, and UV radiation. We propose to study the effect of plasmas on biofilm, bacterial cells, and spores.