

Abstract Submitted
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Atmospheric Plasma Inactivates Biofilm Produced by Hospital Bacteria. MUIREANN FALLON, SARAH KENNEDY, Royal College of Surgeons in Ireland, STEPHEN DANIELS, Dublin City University, Dublin, HILARY HUMPHREYS, Royal College of Surgeons in Ireland — **BACKGROUND** Hospital surfaces are a source of infection due to contamination by bacteria. A novel method of hospital surface decontamination is the use of cold atmospheric pressure plasma (CAPP) systems. CAPP has antimicrobial properties that can inactivate bacterial cells on these surfaces. As an effective hospital decontamination tool, CAPP must kill bacteria within biofilms. Biofilms confer a higher resistance to disinfectants than planktonic bacteria. Here we examine the effects of CAPP on bacterial biofilms. **METHODS** 48-hour biofilms of methicillin-resistant *Staphylococcus aureus* (MRSA) and *Escherichia coli* (*E. coli*) were grown on glass. Biofilms were treated with a CAPP system for 90 seconds. The plasma was produced from a single jet system with an ambient air source gas, powered by a 25 kHz power source. Air was filtered and supplied at approximately 10 slm. Biofilms were stained with BacLight Viability kit and imaged by confocal microscopy. Relative viability in images was calculated using imageJ. **RESULTS** CAPP treatment led to inactivation within the biofilm structure of all bacterial strains. The relative bacterial death after 90s CAPP treatment ranged from 51 to 82% across images and the greatest killing effect was seen on *E. coli* biofilms. **CONCLUSIONS** CAPP treatment of bacterial biofilms resulted in a decrease of viable cells. This can be seen in both MRSA and *E. coli* biofilms. This suggests that CAPP may have a use in the decontamination of hospital surfaces to reduce infections.

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