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Use of internally validated *in vitro* biofilm models to assess antibiofilm performance of silver-containing gelling fibre dressings

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Objective: To assess the efficacy of five silver-containing gelling fibre wound dressings against single-species and multi-species biofilms using internally validated, UKAS-accredited *in vitro* test models.

Method: *Staphylococcus aureus*, *Pseudomonas aeruginosa* and *Candida albicans* single- and multispecies biofilms were cultured using centres for disease control (CDC) biofilm reactors and colony drip flow reactors (CDFR). Following a 72-hour incubation period, the substrates on which biofilms were grown were rinsed to remove planktonic microorganisms and then challenged with fully hydrated silver-containing gelling fibre wound dressings. Following dressing application for 24 or 72 hours, remaining viable organisms from the treated biofilms were quantified.

Results: In single-species *in vitro* models, all five antimicrobial dressings were effective in eradicating *Staphylococcus aureus* and *Pseudomonas aeruginosa* biofilm bacteria. However, only one of the five dressings (Hydrofiber technology with combination antibiofilm/antimicrobial technology) was able to eradicate the more tolerant single-species *Candida albicans* biofilm. In a more complex and stringent CDFR biofilm model, the hydrofiber dressing with combined antibiofilm/antimicrobial technology was the only dressing that was able to eradicate multispecies biofilms such that no viable organisms were recovered.

Conclusion: Given the detrimental effects of biofilm on wound healing, stringent *in vitro* biofilm models are increasingly re-

quired to investigate the efficacy of antimicrobial dressings. Using accredited *in vitro* biofilm models of increasing complexity, differentiation in the performance of dressings with combined antibiofilm/antimicrobial technology against those with antimicrobial properties alone was demonstrated.

Recent Publications

1. Mark G Rippon, Alan A Rogers, Samantha Westgate. Treating drug-resistant wound pathogens with non-medicated dressings: An *in vitro* study. *J Wound Care*. 2019 Sep 2;28(9):629-638.
2. Samantha Westgate, Mark G Rippon, Laura Sellars, et al. Treating drug-resistant wound pathogens with non-medicated dressings: an *in vitro* study. *J Wound Care*. 2019 Sep 2;28(9):629-638.
3. Samantha Westgate, Mark G Rippon, Kathryn M Styles, et al. Effectiveness of a non-medicated wound dressing on attached and biofilm encased bacteria: Laboratory and clinical evidence. *J Wound Care*. 2018 Mar 2;27(3):146-155.

Speaker Biography

Hannah joined Perfectus Biomed in 2013 and has been integral to the journey and growth of the company. Starting as a laboratory technician, Hannah has progressed through the company and has held roles including quality manager, operations manager and head of cell culture & virology. Hannah became commercial senior manager in 2021. During her time with the company, she has led the team to be first in the world to develop and accredit biofilm test methods to ISO 17025, led collaborative projects to conduct ground breaking research into wound care, and played a critical role in obtaining GLP accreditation. Out of work, Hannah enjoys hiking with her family and loves to travel.

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