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Silver oxynitrate - an efficacious compound for the prevention and eradication of dual-species biofilms.

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Abstract

Preventing and eradicating biofilms remains a challenge in clinical and industrial settings. Recently, the present authors demonstrated that silver oxynitrate (Ag_7NO_{11}) prevented and eradicated single-species planktonic and biofilm populations of numerous microbes at lower concentrations than other silver (Ag) compounds. Here, the antimicrobial and anti-biofilm efficacy of Ag_7NO_{11} is elaborated by testing its in vitro activity against combinations of dual-species, planktonic and biofilm populations of Escherichia coli, Staphylococcus aureus and Pseudomonas aeruginosa. As further evidence emerges that multispecies bacterial communities are more common in the environment than their single-species counterparts, this study reinforces the diverse applicability of the minimal biofilm eradication concentration (MBEC™) assay for testing antimicrobial compounds against biofilms. Furthermore, this study demonstrated that Ag_7NO_{11} had enhanced antimicrobial and anti-biofilm activity compared to copper sulfate ($CuSO_4$) and silver nitrate ($AgNO_3$) against the tested bacterial species.

KEYWORDS: Silver; anti-biofilm; antimicrobial; biofilm; multispecies bacteria

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