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Poster abstract submission

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Poster title

EbsArgent™ as a Biofilm-preventing Urinary Catheter Coating System

Poster abstract

Background: Catheter-Associated Urinary Tract Infections (CAUTIs) are a major source of healthcare-associated infections and contribute substantially to antimicrobial resistance (AMR). Durable antibiofilm catheter coatings effective against multidrug-resistant pathogens under physiologically relevant conditions are needed. Here, we report that EbsArgent™, a novel dual-action antimicrobial agent combining the selenocompound ebselen and silver ions and targeting the bacterial enzyme thioredoxin reductase to provide bactericidal activity, can be integrated into a surface-coating system to suppress biofilm formation on urinary catheter material.
Methods: Latex urinary catheter segments were coated with EbsArgent™ and tested in vitro for antibiofilm activity against Escherichia coli CF073 using a static biofilm assay in artificial urine medium over 48h. The effects of EbsArgent™ ratio, curing conditions, and coating stability were assessed. Comparator conditions included uncoated catheters, coating-material-only, aqueous EbsArgent™, and commercial metal-alloy reference catheters. Washout resistance was evaluated by pre-exposure to artificial urine.
Results: EbsArgent™-coated catheters showed strong, dose-dependent inhibition of E. coli CF073 biofilm formation, reducing surface-associated bacterial load by ~2–3 $\log_{10}$ CFU/cm² compared to uncoated and coating material-only controls after 48 h. This activity outperformed commercially available metal-coated reference catheters under the same conditions. The EbsArgent™-coated matrix preserved antibiofilm efficacy following exposure to artificial urine, whereas aqueous EbsArgent™ surface treatment showed rapid loss of activity after short washout periods. Screening of ebselen-to-silver ratios identified an equimolar formulation (1:1) as providing robust biofilm prevention activity while minimizing silver content (Figure). Neither ebselen nor silver alone achieved comparable effects.
Conclusion: EbsArgent™ can be effectively incorporated into a hydrophilic catheter coating system to provide robust, washout-resistant inhibition of bacterial biofilm formation on clinically relevant substrates. The dual-action mechanism targets both planktonic and biofilm-associated bacteria, offering a non-cross-resistant approach to reducing CAUTI incidence. These findings address key limitations of existing antimicrobial catheter coatings and support further evaluation of EbsArgent™-based surfaces for CAUTI

prevention.

Research topic

Small molecule therapeutics

If you wish to submit a graphic with your abstract you can upload it here.