26. Jahrestagung in Tübingen: Poster-Abstracts

Comparative antibacterial dynamics of sulfonated shale oil derivatives and fusidic acid against Gram-positive pathogens

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The emergence of antimicrobial resistance (AMR) presents a significant global challenge for healthcare systems, particularly due to increasingly limited treatment options, renewing interest in older agents. Ammonium bituminosulfonate (ABS) and sodium bituminosulfonate, light (SBS) show in vitro activity against Gram-positive bacteria like Staphylococcus aureus.

This study investigates the antibacterial effects of ABS and SBS compared to fusidic acid (FA) against Staphylococcus aureus and Streptococcus pyogenes. Test organisms were cultured, and inocula were prepared in tryptic soy broth (Oxoid, U.K). Serial dilutions of ABS (20–1250 µg/mL), SBS (8–500 µg/mL), and FA (1.6–100 µg/mL) were prepared in medium. Concentrations were chosen to detect early antibacterial effects within 4 hours. Bacteria were incubated with the test dilutions at 37 °C for 0.5, 1, 2, 4, 8, and 24 hours. Bacterial viability was quantified using the BacTiter-Glo™ Microbial Cell Viability Assay (Promega), based on ATP luminometry. Viability [%] was determined relative to untreated controls. Dose-response curves were generated using logistic-fit regression (OriginLab Origin 2025) to calculate IC50 and IC90 values.

ABS and SBS showed faster and stronger antibacterial effects against Streptococcus pyogenes, with early IC50 reductions. ABS had a delayed but increasing effect on Staphylococcus aureus. SBS showed similar patterns but with slightly faster onset. In contrast, fusidic acid (FA) was more effective against S. aureus, with rapid IC50 and IC90 reductions, but showed delayed, weaker activity against S. pyogenes. Within 24 hours all three substances showed a clear antibacterial activity against S. aureus and S. pyogenes. Nonetheless, these results highlight distinct, organism-specific activity profiles important for targeted antimicrobial therapy.