Examining the Antimicrobial Mechanisms of a Bile Acid-Derived Antibiotic - Implications for Tackling Superbug Infections

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Since the 1930s, antibiotics have revolutionized medicine and saved countless lives from bacterial infections. However, the rise of antimicrobial resistance has increasingly compromised their efficacy, driving the search for new antibiotics. This study investigates the molecular mechanisms underlying the antimicrobial activity of a cationic bile acid derivative. By utilizing disk diffusion assays and membrane permeability tests against representative Gram-positive (B. subtilis) and Gram-negative (E. coli) bacteria, the compound was found to exert its antimicrobial activity via a membrane permeabilization mechanism. Together with dye leakage assays against model membranes, the findings provide insights into how the cationic bile acid derivative compromises bacterial but not mammalian membranes. This research may pave a potential pathway for developing antibiotics with selective activity, offering a promising strategy to combat superbug infections.

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