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# Imidazole-molecule-capped chitosan–gold nanocomposites with enhanced antimicrobial activity for treating biofilm-related infections

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**ABSTRACT:** Biofilms that are widely associated with persistent bacterial infections impose a heavy burden on patients primarily due to their formidable resistance to conventional antiseptic drugs and local immune defense. Here, we successfully synthesized functional gold nanocomposites (CS-Au@MMT) by reducing chloroauric acid in the presence of biocompatible chitosan polymers with cationic amine and the small molecule 2-mercapto-1-methylimidazole (MMT). The cationic amine allowed transport of the CS-Au@MMT to the negatively charged sites at the surface of bacterial cells through electrostatic adhesion, with synergistic effects from the gold nanoparticles and MMT then exerting a strong bactericidal effect to inhibit biofilm formation. For established mature biofilms, CS-Au@MMT was able to adhere to the biofilm

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