

SYNTHESIS AND CHARACTERIZATION OF NOVEL CLR-AG-ZNO NANO-DRUG FOR INHIBITING HELICOBACTER PYLORI

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Poster

Stomach & H. Pylori

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Bimetallic clarithromycin-silver-zinc oxide nanoparticles synthesized using gamma radiation demonstrate antimicrobial activity against multidrug-resistant H. pylori clinical isolates at low concentrations.

KEY POINTS

- Silver nanoparticles, zinc oxide nanoparticles, and bimetallic silver-zinc oxide nanoparticles were synthesized using gamma rays and combined with clarithromycin to create nanocomposites with synergistic effects against H. pylori, a Group I carcinogen infecting roughly 50% of the global population.
- The minimum inhibitory concentration of bimetallic clarithromycin-silver-zinc oxide nanoparticles was determined to be 0.046 to 0.048 micrograms per milliliter using broth microdilution methods.
- Among 60 clinical isolates screened, 20 were positive for H. pylori, with the most resistant isolate confirmed by histopathology, PCR, and genetic sequencing.
- The bimetallic nanoparticles demonstrated antibiofilm activity of 41.82% and substantially reduced bacterial growth, with proposed mechanisms including reactive oxygen species generation and membrane disruption.
- The nanocomposites showed exceptional antibacterial efficacy at low concentrations with sustained durability, indicating potential pharmaceutical and biomedical applications for addressing multidrug-resistant H. pylori infections.

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