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## Recent Developments, Challenges and Future Prospects of Nanoparticles as Antimicrobial Therapeutics

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#### Abstract:

Infectious diseases continue to pose a threat to global health, affecting millions of lives every day, despite many advances in the pharmaceutical and medical industries as well as the creation of several antimicrobial medications designed to inhibit and eradicate harmful germs. The antimicrobial resistance of microorganisms resulting from the overuse and abuse of antimicrobial drugs has become a critical and serious health problem. To address the issue of antibiotic-resistant pathogens, new and innovative treatments must be developed immediately. A potential substitute to antimicrobial drugs might be nanotechnology, as much information exists that nanomaterials, and especially nanoparticles, have broad-spectrum antibacterial action. Nanoparticles could become an indispensable viable therapeutic option for treating drug-resistant infections. In this regard, the purpose of this review is to present a current summary of the most recent research on nanoparticles intended for antimicrobial therapies. Microfluidic techniques can be an appropriate substitute that may result in the production of smaller and more consistent nanoparticles having synergistic effects with antibiotics.



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