

Role of Nano Antibiotics (nAbt) in Treatment of Infectious Diseases due to Drug Resistant Pathogens

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ABSTRACT

One of the greatest health challenges faced by the world today is treating infectious diseases due to the emergence of multidrug and pan drug antimicrobial resistance. The antimicrobial agents that are currently available are not able to cope with the challenges of the newly emerging multidrug-resistant (MDR) pathogens. Other disadvantages of the existing antimicrobial agents are partial or poor absorption in the blood, associated with nausea, vomiting, diarrhoea, over dosage and self-medication. Antimicrobial agents with improved efficacy and avoidance of resistance are the need of the hour which has led to the field of nanotechnology in immunization and combined approach of antimicrobial agents with nanomaterials called “**nanoantibiotics**” (nAbts) for controlling infectious diseases. Different types of nanoparticles are effectively used as drug carriers which help in improving the pharmacokinetics and absorption in the blood. They are also retained in our body for a longer time to achieve the required therapeutic effect. As of now, silver and copper nanoparticles are found to have antimicrobial property. The advantages of nAbts as compared to conventional antibiotics are durability, absorption, controlled release, circulation, targeted delivery, cost effective and economical. Disadvantages are high systemic exposure and nanotoxicity to internal organs. To conclude, nanoantibiotics help in targeted and controlled drug delivery thus enhancing the antimicrobial activity. They also prevent drugs for interacting with normal cells thus avoiding side effects.

Keywords: Nanoantibiotics, Multidrug resistant pathogens, Nanoparticles, Antimicrobial agents

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