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Application of nano-technology to treat anti-microbial resistance (AMR)

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Antimicrobial agents, commonly called antibiotics have dramatically reduced deaths from infectious diseases since their introduction 70 years ago. However, through overuse and misuse, many microorganisms have developed antimicrobial resistance (AMR). Antibiotic-resistance strains of tuberculosis (TB) are emerging and Methicillin-resistant *Staphylococcus aureus* (MRSA) infections are a growing problem in hospitals. This AMR problem causes approximately 25,000 deaths each year and over 1.5 billion in healthcare expenses and productivity losses across the world. Recent developments in nanotechnology to engineer nano-particles with desired physicochemical properties have been projected as a new line of defense against MDR micro-organism. In this abstract, I summarized and discussed the recent development demonstrating the potential of nano-materials to evade the MDR. Nano-particles have shown effective antimicrobial activity against MDR bacteria, such as *Acinetobacter baumannii*, *Pseudomonas aeruginosa*, *Klebsiella pneumoniae*, *Mycobacterium tuberculosis*, vancomycin resistant enterococci, methicillin-resistant *Staphylococcus aureus* and others. Furthermore, new strategies like combination of radiation and drugs with nano-particle that are being explored to potentiate the effectiveness against MDR bacteria have also been summarized. As important as nanotechnology's role in the detection of antibiotic-resistant infections undoubtedly is, the new treatment option it's bringing to the table are generating more excitement as a host of new possible treatments for drug-resistant pathogens begin to emerge. Nanotechnology is not only being envisioned as a replacement for antibiotic treatments. It also holds the potential to preserve and extend the effectiveness of existing antibiotics, primarily by acting as an enhanced drug delivery system to unleash a large and sustained payload of antibiotics to harmful bacteria in a more selective way. Nanotech advancements have been indicated for use in targeted cancer treatments for a while now, but their application as vehicles for antibiotic delivery is relatively new.

Biography

Kuchibhotla Sri Venkata Phani Raghavendra is currently pursuing his Pharm-D 2nd year in Malla Reddy College of Pharmacy, India. He has presented few posters in national conferences.

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