Meetings International SciTechnol

J Nanomater Mol Nanotechnol 2018, Volume: 7
DOI: 10.4172/2324-8777-C4-030

International Conference on

NANOTECHNOLOGY AND NANOENGINEERING

July 16-18, 2018 | Paris, France

The potential role of "Nano antibiotics" in the era of antibiotic resistance: A new approach for treating emerging infectious diseases

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Despite the fact that we live in an era of progressive, advanced and innovative technologies for exposing underlying mechanisms of diseases and molecularly designing new drugs, infectious diseases remain to be one of the greatest health challenges globally. The main drawbacks for conventional antimicrobial agents are the adverse side effects and development of multiple drug resistance, according to a report in Pakistan Gram-positive bacteria, chiefly meticillin-resistant *Staphylococcus aureus* and vancomycin-resistant *Enterococcus* spp are reported and clinical microbiologists increasingly agree that multidrug-resistant Gram-negative bacteria pose the greatest risk to public health. Not only is the increase in resistance of Gram-negative bacteria faster than in Gram-positive bacteria, but also there are fewer new and developmental antibiotics active against Gram-negative bacteria and drug development programs seem insufficient to provide therapeutic cover in 10–20 years. Drug resistance enforces high dose administration of antibiotics, often generating inexcusable toxicity, development of new antibiotics, and requests for significant labor, economic, and time investments. In recent times, nontraditional antibiotic agents have been of remarkable interest in overcoming resistance that is developed by several pathogenic microorganisms against most of the commonly used antibiotics. Exclusively, several classes of antimicrobial nanoparticles (NPs) and carriers of nanosized for antibiotics delivery have confirmed their helpfulness and effectiveness for treating infectious diseases, containing antibiotics resistant ones, in vitro as well as in animal models. This poster précises emerging energies in fighting against infectious diseases, predominantly using antimicrobial NPs and antibiotics delivery systems as new tools to tackle the current challenges in treating infectious diseases.

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