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Potency of injectable nano formulations as robust anti-bacterial agent to combat bacterial resistance

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Introduction: Resistance to a wide spectrum of antibiotics and antibacterial agents is prevalent, and it can be induced by a variety of mechanisms, including efflux pumps and exocytosis. Two nano-formulations, nanoparticles, and nano vesicular systems have been constructed, and their physicochemical characteristics have been examined to show their suitability for developing injectable nano formulations. The in vitro antibacterial potential was examined to determine the efficacy of injectable nano formulations.

Methods: The nanoparticles and nanovesicles were effectively formulated and characterized physicochemical by zeta potential (ZP), polydispersity index (PDI), particle size distribution, SEM, TEM, XRD and DSC analysis. In vitro agar well diffusion technique was performed to demonstrate the anti-bacterial efficacy against selected human pathogenic bacteria.

Results: Interestingly, both nanoparticles and nanovesicles exhibit unique physicochemical characterization. The injectable

dosage forms were homogenous, and their antibacterial spectrum were demonstrating broad spectrum activity against selected both Gram-positive and Gram-negative bacteria.

Conclusion: The results of the studies showed that injectable nano formulations were successful to target human pathogenic bacteria to combat bacterial resistance.

Speaker Biography

S.M. Sivakumar is an Assistant Professor at the College of Pharmacy, Jazan University, Jazan, Kingdom of Saudi Arabia. He is an active researcher, undergoing many funded projects. His research work is on nano-medicines targeted delivery, drug delivery, and vaccine delivery. His research work extended on newer drug design for the development of antimicrobials, anticancer, and immunomodulatory principles from the seaweed and herbs of the southwestern region of Saudi Arabia. He has more than 50 research and review articles in peer-reviewed journals.

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