Antimicrobial applications of nanoliposome encapsulated silver nanoparticles a potential strategy to overcome bacterial resistance

ABSTRACT

Bacterial infections result in hundreds of million cases of severe illness annually worldwide. Rapidly increasing drug resistance of pathogens further aggravates this threat to human health and warrants the search for effective broad-spectrum antibacterial agents. Silver metal has a long history of application in human medicine and healthcare. In ancient times, silver was employed as a disinfectant for water purification and storage while it is still being used as an antimicrobial ingredient in some nanotechnology-based products. Encapsulation of antimicrobial substances such as silver nanoparticles in nanoliposomes could provide protection and targeting for the encapsulated or entrapped material. Nanoliposomes are biocompatible and biodegradable drug delivery systems with the ability to encapsulate both lipid-soluble and water-soluble compounds, as well as metal ions. Furthermore, nanoliposomes have been shown to be able to deliver encapsulated agents to target bacteria in vitro as well as in vivo. In this review, we present the use of nanoliposome-encapsulated silver nanoparticles as an efficient system for antibacterial applications.