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Silver nanoparticles as broad spectrum antibacterial agent

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Emergence of antibiotics resistant bacteria pathogens and the rapid spreading around the world threaten to take us back to the pre-antibiotic era. Concerns are raised to promote personal hygiene to minimize spread of infections and appropriate use of antibiotics to slow down the development of antibiotics resistance in pathogens. However, recent emergence of resistance towards new classes of antibiotics, for example, carbapenem and colistin resistant bacteria has urged the need of new antibiotics. In this study, we synthesized and characterized small monodispersed spherical silver nanoparticles (AgNPs) coated with Polyethylene Glycol (PEG) with average diameter of 2.56nm. The stable, water soluble, biocompatible AgNPs were prepared in a simple manner in ethanol under ambient light at 4°C with purification to remove unreacted raw materials. The antibacterial activity of the AgNPs towards a range of both antibiotics sensitive and resistant Gram positive and Gram negative bacteria was examined. The tested Gram positive bacterial strains included *Staphylococcus aureus, Staphylococcus epidermidis*, *Enterococcus faecalis, Bacillus subtilis* and *Streptococcus mutans,* while Gram negative strains included *Escherichia coli*, *Enterobacter cloacae, Klebsiella pneumoniae* and *Pseudomonas aeruginosa*, covering a wide range of bacterial pathogens responsible for infections in many parts of the human body, for example, pneumonia, infections in bloodstream, urinary tract, bone and joint, wound and surgical site. Moreover, combinational antibacterial activity of the AgNPs with conventional antibiotics was also investigated. The simple preparation of this antibacterial AgNPs may be suitable for the formulation to combat a broad range of bacterial infections.

Biography

Ann Lok Yan So has received her PhD in Chemical Biology from The University of Hong Kong in 2012. She is currently working on novel antibiotics development in Hong Kong Polytechnic University as a Research Fellow. She is particularly interested in developing new drugs against antibiotics resistant bacteria..

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