

Silver Nano bullets as an antibacterial and wound healing agents

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Abstract

It is understood that the silver salts and the ions formed have seldom usage as an antimicrobials. As such Ag⁺ ions and salts of silver have only limited usefulness as anti-pathogenic agents. One of the most possible reasons is the toxicity of the silver salts to the host as it continuously releases silver ions at a higher level. Such problems can be avoided using silver nanoparticles. We envisage here the new, simple and efficient microwave-assisted route of rapid extracellular synthesis of monodispersed, spherical shaped silver nanoparticles from different microorganisms, plants and bio-excretories. In plants, it is noticed that a chemical component, flavonoids are covered the surface of silver nanoparticles There lies a strong challenge to produce stable and safe AgNP to prevent bacterial growth significantly. Though the antibacterial activity of AgNP is being studied extensively, reports on the effect of these bio-functionalized nanoparticles in particular are rare. Free-radical involvement of AgNP surface in antimicrobial activity is discussed based on their zone of inhibition. Biosynthesized AgNP can be used as an effective tool in the control of microorganisms at a very low concentration and as a preventive agent in deleterious infections. The present study we have also focused on the efficacy of biocompatible silver nanoparticles in vivo wound healing. The nanotoxicology study aimed to characterize the potential toxic effects of silver and gold nanoparticles in Sprague Dawley rats. They were subjected to detailed clinical, histopathological, hematological, biochemical, examination study during the exposure and at termination. In conclusion we can say that when silver nanoparticles nanoparticles are administered in the form of intravenous injections to Sprague Dawley rats daily for four weeks, the no_observed_effect_level (NOEL) was found to be greater than 500 mg/ kg.

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Biography

Dr. Raghunandan Deshpande received his PhD at Jawaharlal Nehru Technical University, Hyderabad (JNTU), India, in Pharmaceutical Sciences. He is working as Associate Professor and Head of the Department in Pharmaceutical Chemistry, HKES's Matoshree Taradevi Rampure Institute of Pharmaceutical Sciences working since 8 years. He worked as Principle collaborator in the project sponsored by the Board of Research in Nuclear Sciences BRNS, (Department of Atomic Energy DAE). He has been associated with various projects awarded by SERB-NPDF mentor, RGUHS advance grant, UGC, AICTE, BRNS DAE and VGST. He has more than 33 publications and applied 3 patents in Nanobiotechnology. He has awarded Karnataka state young scientist from Bharata Ratna CNR Rao in the year 2012.