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Biogenic Iron Oxide Nanoparticles and Their Applications

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Despite the wide-ranging uses of iron oxide nanoparticles, the physical and chemical methods commonly used to synthesize them, limits their application. Physical methods are generally power-intensive, while chemical methods employ chemicals for surface modification which often render the nanoparticles toxic to be used for biological applications. As a result, biological materials can be used either to synthesize the nanoparticles or can act as capping agent to make them biocompatible. In the present study, two types of iron oxide nanoparticles, namely hematite nanoparticles and superparamagnetic iron oxide nanoparticles (SPIONs) have been synthesized using biological means. The former have been synthesized using a culture of *Bacillus cereus*, while the latter have been coated with various plant extracts. The potential of these nanoparticles in biomedical applications and environmental remediation have been explored using *In-Vitro* cytotoxicity assays, antioxidant assays, bacterial inhibition studies and adsorption studies.

Biography:

Dr. Shampa Sen completed her Ph.D. in Environment from Indian Institute of Technology, Guwahati, India. She is the Associate Professor at School of Bio-Sciences and Technology, VIT, Vellore, India. With extensive experience in academia, she has more than 60 publications in the fields of biotechnology, drug design, nanobiotechnology and nutraceuticals. She has edited two books published by Taylor and Francis, "Nanotechnology in Nutraceuticals: Production to Consumption" and "Machine Learning and IoT: A Biological Perspective". She is actively involved in many professional development activities. Her research interests include biosynthesis of metallic nanoparticles, nanoparticles in biomedical and environmental applications, metabolic engineering, drug design and computational biology. She is a life member of Biotech Research Society, India (BRSI), Environmental Mutagen Society of India (EMSI) and zonal co-ordinator of International Neural Network Society (INNS). She is also a Fellow of the Royal Society of Biology.