

Metal Nanoparticles in Microbiology

Mahendra Rai • Nelson Duran
Editors

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 Springer

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Preface

Nanotechnology is a multidisciplinary and interdisciplinary science dealing with various aspects of research and technology at nanolevel. Nanoparticles range from 1 to 100 nm, which form building blocks of nanotechnology. Metal nanoparticles such as gold, silver, platinum and copper have gained considerable attention in recent times due to their fundamental and technological interest. These nanoparticles have unique catalytic, electronic and optical properties different from the metallic particles. Usually, the nanoparticles can be synthesized by physical, chemical and biological methods. The physical and chemical methods involve the use of strong chemical reducing agents such as sodium borohydride and weak reducing agents such as sodium citrate, alcohols, use of gamma- and UV rays, etc. Studies have reported that the biological methods depict an inexpensive and eco-friendly method for synthesis of nanoparticles. To date, biosynthesis of nanoparticles has been demonstrated by the use of biological agents such as bacteria, fungi, yeasts actinomycetes and plants.

Synthesis of nanoparticles using microbes or plants is a new and emerging eco-friendly science. Many investigators have been using biological methods for the synthesis of nanoparticles. So far, there is no book on biogenic nanoparticles. Therefore, this would be the first book of its kind all over the world.

The book covers synthesis of nanoparticles by different microbes (bacteria, cyanobacteria and fungi) and plants, the mechanism involved in biosynthesis and multiple applications of the nanoparticles.

The book would be immensely useful for diverse discipline of students and teachers of nanotechnology, biology, chemistry, physics, botany, zoology, chemical technology, earth sciences, medicine, pharmacology, mycology, microbiology, pathology and biotechnology.

The book incorporates the contributions of leading researchers in the field of biogenic metal nanoparticles. The editors highly appreciate the contribution by eminent scholars and their patience during the publication of the book.

We wish to express our sincere thanks to Dr. Jutta Lindenborn for her continued interest, critical suggestions and prompt response during the editing process. MKR

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