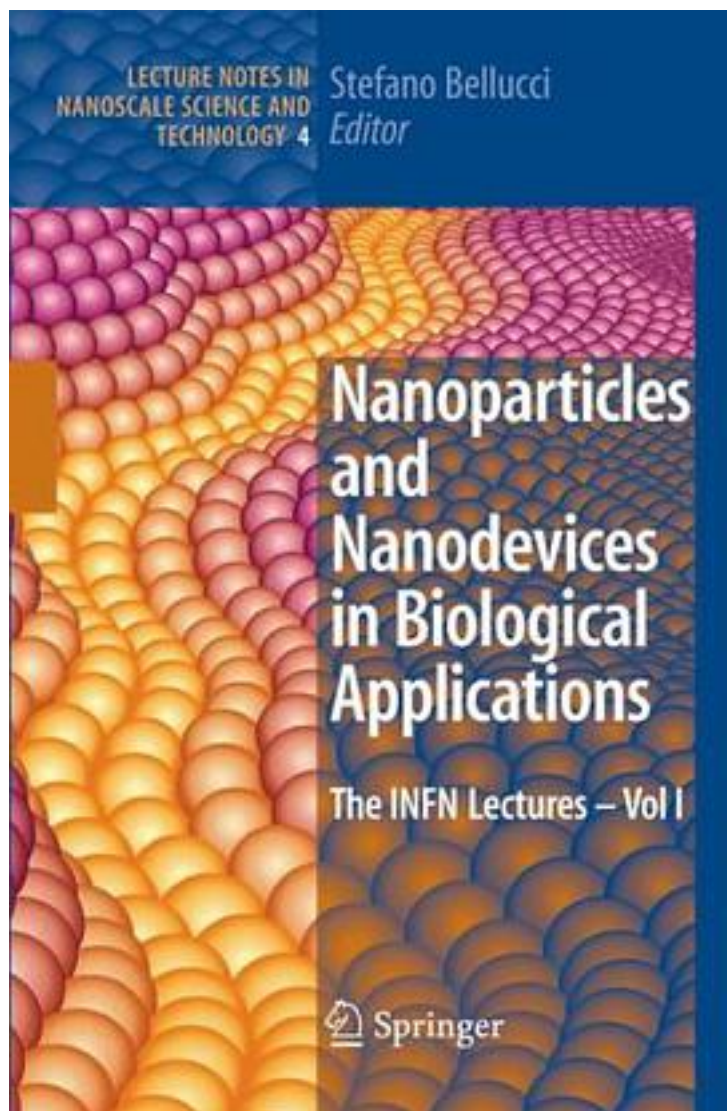


# Nanoparticles and Nanodevices in Biological Applications



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This is the first volume in a series of books on selected topics in Nanoscale Science and Technology based on lectures given at the well-known INFN schools of the same name. The aim of this collection is to provide a reference corpus of suitable, introductory material to relevant subfields, as they mature over time, by gathering the significantly expanded and edited versions of tutorial lectures, given over the years by internationally known experts. The present set of notes results in particular from the participation and dedication of prestigious lecturers, such as Vincenzo Balzani, Santina Carnazza, Andrea Salis Barbara Panessa-Warren and Stefano Bellucci. As usual, the lectures were subsequently carefully edited and reworked, taking into account the extensive follow-up discussions. A tutorial lecture by Vincenzo Balzani and collaborators (Univ. Bologna, Italy) introduces the reader to the topic of molecular devices and machines, seen as a journey into the nano world. Santina Carnazza (Univ. of Messina, Italy) contribution deals with surface bio-functionalization aimed to enhance promonocytic cells adhesion and spatial confinement, and micro-patterning of polymer surfaces. Andrea Salis and co-workers (Univ. Cagliari, Italy) go about biotechnological applications of lipases immobilized onto porous materials, i.e. biodiesel production and biosensors. Understanding the biological effects of nanoparticles at the mesoscopic (microPET) and microscopic levels (light and electron microscopy) is essential to predict nanoparticle processing, degradation and excretion in cells, and mammalian systems in general. In this respect, Barbara Panessa-Warren (BNL, USA) in her lecture provides the reader with an overview of the types of phenomena occurring with living cells and tissues exposed to nanoparticles, as well as new experimental data on the biological cell and tissue responses in vitro and in vivo to nanoparticles designed for bio-medical use. An extensive contribution to review recent results about the toxicity of nanomaterials, concentrating in particular on carbon nanotubes, is the subject of the tutorial by Stefano Bellucci (INFN-LNF, Italy).

作者介绍:

目录:

[Nanoparticles and Nanodevices in Biological Applications\\_ 下载链接1](#)

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