

Clinical Applications of Magnetic Nanoparticles

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Offering the latest information in magnetic nanoparticle (MNP) research, this book builds upon the success of the first volume and provides an updated and comprehensive review, from synthesis, characterization, and biofunctionalization to clinical applications of MNPs, including the diagnosis and treatment of cancers. The book captures some of emerging research area which was not available in the first volume. Good Manufacturing Practices and Commercialization of MNPs are also included. This volume, also written by some of the most qualified experts in the field, incorporates new developments in the literature, and continues to bridge the gaps between the different areas in this field.

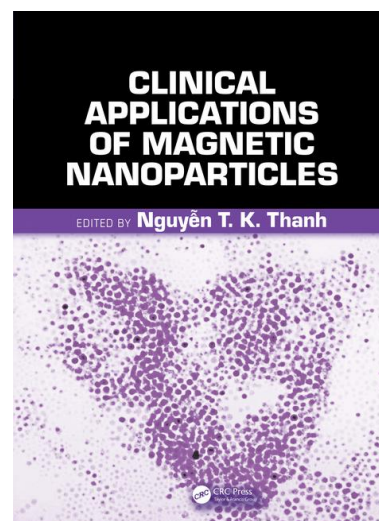
KEY FEATURES

- Presents contributions from a broad range of internationally known and respected scientists, engineers, entrepreneurs, and clinicians
- Supplies comprehensive coverage of the topic, from synthesis, biofunctionalization, and characterization to biomedical and clinical applications
- Stimulates new research and further development of clinical applications
- Emphasizes technological, scale up and commercialisation, and clinical applications

SELECTED CONTENTS

Fabrication and Characterisation of MNPs
Controlling the size and the shape of uniform magnetic iron oxide nanoparticles for biomedical applications
Magnetic Nanochains: properties, synthesis and prospects
Magnetisation dynamics for magnetic particle detection at the nano-scale
Biofunctionalisation of MNPs for Biomedical Application
Challenge of functionalisation of MNPs
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Encapsulation of drugs in functionalized nanoparticles
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Ex-vivo Application of MNPs
Working Principles of Magnetic Separation for Biomedical Diagnostic Applications
Magnetic separation in integrated micro analytical systems
Magnetic-Plasmonic Hybrid Nanoparticles for Organelle Separation
Magnetic nanoparticles based biosensing. Metallic nanoparticles (carbon coated)
In-vivo Application of MNPs
Immunotoxicity and safety considerations for iron oxide nanoparticles
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Mechanisms of macrophage recognition of iron oxide nanoparticles
Bioheat modeling
Designing Magnetic Nanoparticles for Cancer Treatment using Magnetic Hyperthermia

Nanoparticles for nanorobotic agents dedicated to cancer therapy
Smart nanoparticles and the effects in magnetic hyperthermia in vivo
Non-invasive guidance scheme of magnetic nanoparticles for drug targeting in Alzheimer's disease
Development of magnetic porous PDMS for on-demand drug delivery applications
Ferrofluid for hyperthermia and targeted and sustained drug delivery
Magnetic Particle Transport through Complex Media
Magnetic nanoparticles for neural engineering
MRI
Multimodal imaging of magnetic nanoparticles: applications and methodologies
Red Blood Cell constructs to prolong in vivo the life span of iron-based MRI/MPI contrasting agents
Animal Studies of Magnetic Nanoparticles
Bio-inspired magnetic nanoparticles for biomedical applications
Microwheel for blood clot
Stimuli regulated Cancer Theranostics Based on Magnetic Nanoparticles
Regulatory and Commercialisation
Good Manufacturing Practices (GMP) of Magnetic nanoparticles
Commercialisation of new variety of magnetic particles to the global market



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Magnetic Nanoparticles

From Fabrication to Clinical Applications

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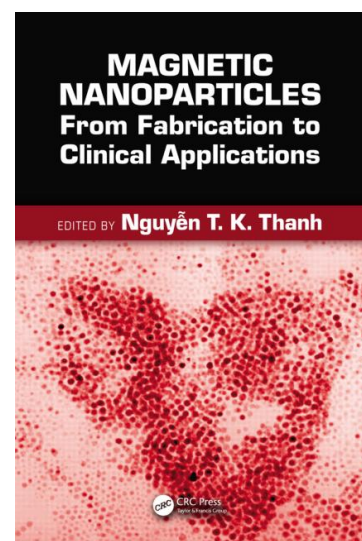
Offering the latest information in magnetic nanoparticle (MNP) research, this volume reveals the in-depth knowledge behind this highly important and emerging area of nanotechnology. It covers synthesis, characterization, and biofunctionalization to clinical applications of MNPs, including diagnosis and treatment of cancers. Balancing clinical applications with the underlying theory and foundational science behind these new discoveries, this book will benefit those entering the field as well as practicing engineers working on new research and further groundbreaking developments.

KEY FEATURES

- Presents contributions from a broad range of internationally known scientists, engineers, and clinicians
- Includes a foreword by Prof Mostafa El Sayed
- Contains full biosketches and photographs of the contributors
- Supplies comprehensive coverage of the topic, from synthesis, biofunctionalization, and characterization to biomedical and clinical applications
- Stimulates new research and further development of clinical applications
- Emphasizes technological, diagnostic, and clinical applications

SELECTED CONTENTS

Fabrication and Characterization of MNPS. Biofunctionalisation of MPS for Biomedical Applications. Ex Vivo Application of MNPS. In Vivo Applications of MNPS.



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