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Autore	ZHANG Xin
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Nota di contenuto	Front matter -- Foreword -- Preface -- Contents -- Section 1. Magnetic Fields and Their Biological Effects -- Chapter 1. Medical Theranostics Based on Iron Oxide Nanoparticles under Magnetic Fields -- Chapter 2. Progress of Static Magnetic Fields and Cancer Research in China -- Chapter 3. Study of SMF's Effects on Cells, Microorganisms, Animals and Plants in NPU -- Chapter 4. In Vitro Cellular Response to ELF-MF and RF-EMF -- Chapter 5. Utilization of Magnetic Field for Protein Crystallization -- Chapter 6. High Static Magnetic Fields (SMFs) on Reproduction and Development of an Intact Living Organism: Caenorhabditis elegans -- Chapter 7. Low Frequency Magnetic Field Regulates Immunity and Inhibits Cancer -- Chapter 8. Moderate Intensity Rotating Low :Frequency Magnetic Fields and Their Effects on Human Bodies -- Chapter 9 Advances in Static Magnetic Field Safety Studies -- Section 2. Nuclear Magnetic Resonance(NMR) and Magnetic Resonance Imaging(MRI) -- Chapter 10. Structural Basis of Biomolecular Interactions Studied by NMR Spectroscopy -- Chapter 11. Protein NMR Spectroscopy in Cell-like Environment -- Chapter 12. High-resolution Nuclear Magnetic Resonance Techniques under Inhomogeneous Magnetic Fields -- Chapter 13. 19F Nuclear Magnetic Resonance /Magnetic Resonance Imaging in China -- Chapter 14. Ultrasensitive Xenon MRI and Molecular Imaging -- Chapter 15. NMR

Sommario/riassunto

Magnetic field is a ubiquitous physical field. Humans have long been aware that certain birds can use the Earth's magnetic field to navigate. Indeed, such phenomenon inspired people to explore the biological effects of magnetic field and the underlying mechanism. The man-made ultra-high or ultra-weak magnetic fields provide excellent experimental conditions for material sciences and life sciences. Since the beginning of the 1990's, magnetic resonance imaging (MRI) has been widely introduced as a stand-alone diagnostic technique in hospitals. As the image quality of MRI is positively correlated with the strength of the magnetic field, MRI instrument equipped with ever stronger magnet has been built, from 1.5 to 3 Tesla and higher. There is an urgent need to understand the safety limit of the maximum magnetic field strength on human health. This book mainly focuses on the progresses of inter-disciplinary researches of high magnetic fields and life sciences by researchers from mainland China. The topics covered can be roughly divided into two major categories. One is to study the effects of high magnetic fields on biological samples, such as cell, humans and animals. The other is to utilize techniques that based on high magnetic field to study biological questions, such as using NMR (Nuclear Magnetic Resonance) and MRI (Magnetic Resonance Imaging) in structural biology and medical imaging. The researches about the biological effects of high magnetic fields are very interesting and inspiring, but still at a very initial stage. More studies are needed to promote the scientific development of this field, and their potential applications in medicine.

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