
Preface

The rapid advancements in nanoscience of the past two decades have firmly enthroned nanotechnology as the technology of the new millennium. Nanomaterials are novel materials due to their unique physicochemical and optoelectronic properties. The small size, in the range of 1–100 nm, has the potential for almost unlimited applications. This enabling technology holds the key to several recent innovations in diverse sectors, including pharmaceutical, electronic, energy, textile, environmental, agricultural and consumer products.

This book, *Nanobiotechnology: Human Health and the Environment*, intends to present a comprehensive overview of the current progress at the intersection of nanotechnology and biology. This book addresses various aspects of nanomaterials research and development that are closely related to human and environmental health. This book contains 14 chapters primarily focused on areas like bio-inspired/bio-mimetic, bio-imaging, disease treatment, diagnostics, food products, and the environment.

Chapter 1 introduces the reader to contemporary developments in nanobiotechnology with special reference to toxicity, sustainability, and future perspective. A few chapters focus on nanotheranostics and nanodevices for early diagnosis and therapy of diseases like cardiovascular disease and lung cancer. Specific chapters related to the surface modification of nanomaterials, contrast agents for medical imaging, and detection of cancer cells provide useful information for development of novel materials for biomedical applications.

The impact and fate of nanomaterials in the environment has received attention in this book, as development of safe nanoproducts is an intrinsic component of nanobiotechnology. This book contains chapters related to the application of nanoparticles in bioremediation, solubility of nanoparticles, and their relevance to nanotoxicity studies. Additionally, Chapter 12, "Nanotechnology in Functional Foods and Their Packaging," is intended to add value to this book in the evolving dimension of food and nanotechnology.

This book aims to address the impact of nanomaterials on human and environmental health as well as to improve our understanding of these novel materials for sustainable mega-exploitation of the nano dimension.