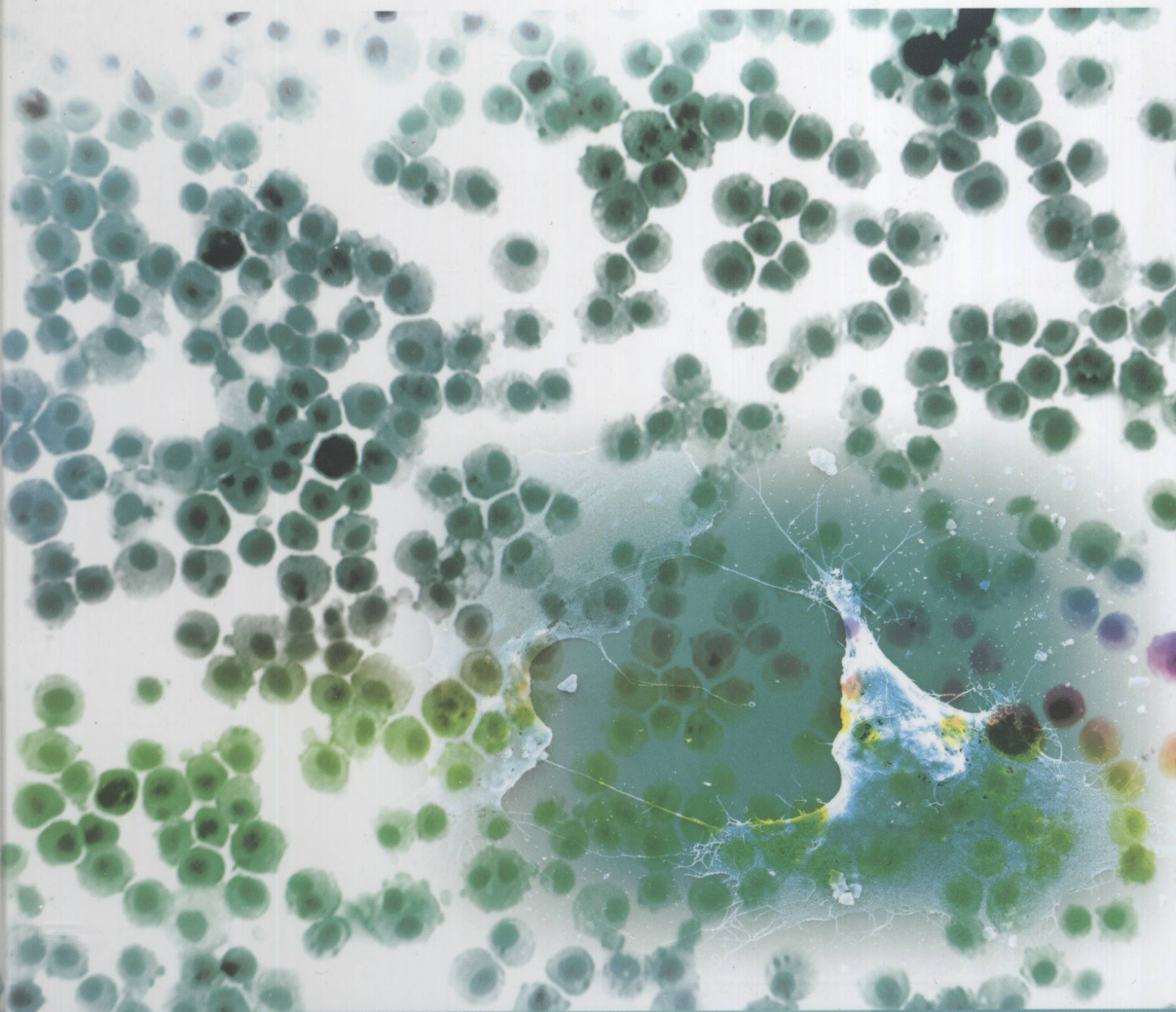


Editors SAURA C. SAHU | DANIEL A. CASCIANO

Nanotoxicity

From *In Vivo* and *In Vitro* Models to Health Risks



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Nanotoxicity

Dedicated to

My parents, Gopinath and Ichhamani, for their gift of life, love and living examples

My wife, Jharana, for her life-long friendship, love and support

My children, Megha, Sudhir and Subir, for their love and care

Saura C. Sahu

Preface

Nanotechnology is a rapidly developing, emerging branch of modern technology. This new technology deals with materials of extremely small size, generally in the range of nanometres. The nanomaterials, with their extremely small size and high surface area associated with greater strength, stability, chemical and biological activity, find their wide range of applications in a variety of products in modern society. They are used in rapidly increasing nanoproducts, nanodevices, electronics, diagnostics and drug delivery systems. They are present in a variety of consumer products such as foods, drugs, cosmetics, food colour additives, food containers, paints and surface coatings. This trend is expected to result in an ever-increasing presence of nanoparticles in the human environment. Because of their extremely small size they are capable of entering the human body by inhalation, ingestion, skin penetration, intravenous injections and medical devices, and have the potential to interact with intracellular macromolecules. Because of their greater stability they are anticipated to remain in the body and in the environment for long periods of time. However, information on their potential adverse health effects is very limited at the present time. It is not known at what concentration or size they can exhibit toxicity. Therefore, there are obvious public safety concerns. This has led to the initiation of a new research discipline commonly known as nanotoxicology.

The main purpose of this book is to assemble up-to-date, state-of-the-art toxicological information on nanomaterials presented by recognized experts in a single edition. Therefore, it is an authoritative source of current knowledge in this area of research. The book is designed primarily for research scientists currently engaged in this field. However, it should be of interest to a variety of scientific disciplines including toxicology, genetics, medicine and pharmacology, as well as drug and food and material sciences. Also, it should be of interest to federal regulators and risk assessors of drug, food, environment and consumer products.

Nanotoxicology is an emerging new multidisciplinary field of science, and therefore there is a risk of change in its rapid development in the near future. However, its fundamental concepts and ideas as well as the experimental data are not going to change. For years to come this book will be a very valuable reference source to students and investigators in this research field to guide them in their future work.

Saura C. Sahu and Daniel A. Casciano

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