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*“Rare earth elements are involved in a number of essential technological applications. Their effects raise a number of challenges in environmental sciences and in human health. The present book provides an extensive and balanced survey of the manifold—adverse and favorable—effects associated with rare earth elements.”*

**Prof. Dr. José L. Domingo**  
Rovira i Virgili University, Spain

*“The present book is a valuable tool to gain insight into the complex and sometimes surprising health effects of rare earth elements. Especially interesting—due to my field of research—are the chapters addressed to the study of the changes in redox endpoints in a number of organisms and cell systems. This carefully edited book, with a multidisciplinary view of rare earth elements, is really an important scientific contribution.”*

**Prof. Dr. Federico V. Pallardó**  
University of Valencia, Spain

*“I congratulate the authors for this timely production of an extensive overview of an important topic in environmental and medical sciences: the risks and challenges that may be connected with increasing use and distribution of rare earth elements. It is essential to increase our knowledge about the environmental fate and biological effects of these technologically so important metals in order to prevent unforeseen long-term consequences of our doing. This book will surely become an important resource for scientists, engineers, and decision makers who understand the need of a sensible exploitation of this resource.”*

**Prof. Dr. Susanne Heise**  
Hamburg University of Applied Sciences, Germany

This book presents the multifaceted aspects of rare earth elements (REEs), focusing on both their potential benefits and adverse health effects. The adverse impacts of REEs on human and environmental health raise a growing concern not only in the scientific community but also among a number of stakeholders, potentially including students, media workers, and decision makers. The recognized and potential benefits arising from REE-related technological applications may envisage their further advantages.

A limited number of books have been devoted so far to REEs, and they mainly focus on REE-related chemistry, mineralogy, economy, and developing technologies for these elements. This book presents recent research achievements in REE-associated health effects, which have been mostly confined to journal reports on individual laboratory studies so far. It is an updated and balanced approach to REE research and technology. It provides novel yet established information as stated in the title “At the Crossroads between Toxicity and Safety,” with particular emphasis on the hormesis phenomenon.



**Giovanni Pagano** has 40 years' experience in environmental research, including projects supported by grants from the European Commission and the North Atlantic Treaty Organization. He has been a senior scientist at the Italian National Cancer Institute in Naples, Italy, and a contractor scientist at the University of Naples Federico II, Italy. He is a visiting professor in various universities of France, Greece, and Croatia. Prof. Pagano has published 105 journal articles and 22 book chapters, with 1900 ResearchGate citations.