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Environmental Nanotechnology Volume 3

 Springer

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Preface

We dedicate this book to those who are affected by environmental hazards. We hope that this book may be a small contribution to improving their quality of life.



Think Environment – Think Nanomaterials
- Dr. Nandita Dasgupta

This book is the third volume of *Environmental Nanotechnology* from its several volumes and contains the chapters related to nanoremediation, waste water purification, nanosensors, nanomedicine, and nanofiltration. This book also highlights the safety aspects and risk assessment and management related to several toxins and nanotechnology-related solution for these challenges. New nanomaterials have been discussed from the nexus of environment, water, remediation, and total environment. Total environment is a main factor issue to decide good health of human mankind as well as for food and agriculture in the context of health, sustainable growth, and efficient agro-food product development. As a consequence, novel technologies are emerging fast, and environmental nanotechnology is one among them. In particular, pollution issues of air and water can be solved by environmental nanotechnologists, which include nanobioremediation, nanonutraceuticals, nanobiosensors, and nanodegradation.

The first chapter by Agboola et al. discusses about the nanomaterials for sustainable environment and clean water. Then, Lupu et al. review the use of inorganic nanomaterials in therapeutic applications of malignant diseases in Chap. 2. In Chap. 3, Klosov and Klosova et al. explain the modification of oligomers and

reinforced polymeric composites by carbon nanotubes and ultrasonic. Interaction of nanomaterials with soil is reviewed in Chap. 4 by Piplai et al. Applications of nanotechnology for water treatment are presented by Ali and Ahmad in Chap. 5. Overview of nanomaterial-assisted technologies for denitrification processes has been presented by Mirbagheri and coauthors in Chap. 6. Lohith et al. detail the nanoencapsulation of food carotenoids in Chap. 7. Overview on nanomaterials for agricultural applications has been presented by Garg and Payasi in Chap. 8. In Chap. 9, Singh and Kumar present the effect of the interaction of nanoparticles with roots on the uptake in plants. Hassan and Elkady describe the semiconductor nanomaterial applications for gas sensor applications in Chap. 10.

Thanks for reading!

Lucknow, Uttar Pradesh, India
Kolkata, India
Aix-en-Provence, France

Nandita Dasgupta
Shivendu Ranjan
Eric Lichtfouse

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About the Editors



Nandita Dasgupta has completed her BTech and PhD from VIT University, Vellore, India. She is Elected Fellow (FBSS) of Bose Science Society. She has major working experience in micro-/nanoscience and is currently working as Assistant Professor at the Department of Biotechnology, Institute of Engineering and Technology, Lucknow, India. Earlier at LV Prasad Eye Institute, Bhubaneswar, India, she has worked on mesenchymal stem cell-derived exosomes for the treatment of uveitis. She has exposure of working at university, research institutes, and industries including VIT University, Vellore, Tamil Nadu, India; CSIR-Central Food Technological Research Institute, Mysore, India; Uttar Pradesh Drugs & Pharmaceutical Co. Ltd., Lucknow, India; and Indian Institute of Food Processing Technology (IIFPT), Thanjavur, Ministry of Food Processing Industries, Government of India. At IIFPT, Thanjavur, she was involved in a project funded by a leading pharmaceutical company, Dr. Reddy's Laboratories, and has successfully engineered micro-vehicles for model drug molecules. Her areas of interest include micro/nanomaterial fabrication and its applications in various fields – medicine, food, environment, agriculture and biomedicine.

She has published 13 edited books and 1 authored book with Springer, Switzerland. She is an Associate Editor of *Environmental Chemistry Letters* – a Springer journal with an impact factor of 3.2.



Shivendu Ranjan has completed his BTech and PhD in Biotechnology from VIT University, Vellore, India, and has expertise in nano(bio)technology. He is Elected Fellow of Bose Science Society (FBSS) and is currently working as Head of Research & Technology Development at E-Spin Nanotech Pvt. Ltd., SIDBI Center, Indian Institute of Technology, Kanpur, India. After joining E-Spin Nanotech, IIT, Kanpur, he has successfully developed prototypes for many products and three patents. He is also serving as a Senior Research Associate (Adjunct) at the Faculty of Engineering and Built Environment, University of Johannesburg, Johannesburg, South Africa. He is also mentoring Atal Innovation Centre, Bhubaneswar, Odisha, and giving his technical inputs to the center. Atal Innovation Centre is the part of Atal Innovation Mission of the NITI Aayog, Government of India. He is also Reviewer of Iran National Science Foundation (INSF), Tehran, Iran, and Jury at Venture Cup, Denmark, from the past three consecutive years. He had founded and drafted the concept for the first edition of the “VIT Bio Summit” in 2012, and the same has been continued till date by the university. He has worked in CSIR-CFTRI, Mysuru, India, as well as in UP Drugs and Pharmaceutical Co. Ltd., India, and IIFPT, Thanjavur, MoFPI, Government of India. At IIFPT, Thanjavur, he was involved in a project funded by a leading pharmaceutical company, Dr. Reddy’s Laboratories, and has successfully engineered micro-vehicles for model drug molecules.

His research interests are multidisciplinary which includes micro-/nanobiotechnology, nano-toxicology, environmental nanotechnology, nanomedicine, and nanoemulsions. He is an Associate Editor of *Environmental Chemistry Letters* – a Springer journal with an impact factor of 3.2. He has published six edited books and one authored book with Springer, Switzerland, and many scientific articles in international peer-reviewed journals, and has authored many book chapters as well as review articles. He has also received several awards and recognitions from different national and international organizations.



Eric Lichtfouse PhD, born in 1960, is an Environmental Chemist working at the University of Aix-Marseille, France. He has invented carbon-13 dating. He is teaching scientific writing and communication and has published the book *Scientific Writing for Impact Factor Journals*, which includes a new tool – the micro article – to identify the novelty of research results. He is Founder and Chief Editor of scientific journals and series in environmental chemistry and agriculture. He founded the European Association of Chemistry and the Environment. He received the Analytical Chemistry Prize by the French Chemical Society, the Grand Prize of the Universities of Nancy and Metz, and a Journal Citation Award by the Essential Indicators.

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