



Biotechnological Advances for Microbiology, Molecular Biology, and Nanotechnology

An Interdisciplinary Approach to the Life Sciences
Edited By *Jyoti Ranjan Rout, Rout George Kerry, Abinash Dutta*

Edition	1st Edition
First Published	2022
eBook Published	28 April 2022
Pub. Location	New York
Imprint	Apple Academic Press
DOI	https://doi.org/10.1201/9781003161158
Pages	694
eBook ISBN	9781003161158
Subjects	Bioscience, Engineering & Technology

Share
66
Citation

You do not have access to this content currently. Please click 'Get Access' button to see if you or your institution have access to this content.

GET ACCESS PREVIEW PDF

To purchase a print version of this book for personal use or request an inspection copy >>

GO TO ROUTLEDGE.COM

RELATED BOOKS

Book
Human Embryonic Stem Cells
Edited By *Jan Odorico, Roger Pedersen, Su-Chun Zhang*

Book
Stem Cells and Revascularization Therapies
Edited By *Hyunjaon Kong, Andrew J. Putnam, Lawrence ...*

Book
Nanobiomaterials
Edited By *Anil K. Sharma, Raj K. Keservani, Rajesh K...*

ABSTRACT

Biotechnological Advances for Microbiology, Molecular Biology, and Nanotechnology: An Interdisciplinary Approach to the Life Sciences presents cutting-edge research associated with the beneficial implications of biotechnology on human welfare.

The volume mainly focuses on the highly demanding thrust areas of biotechnology that are microbiology, molecular biology, and nanotechnology. The book provides a detailed overview of the beneficial roles of microbes and nanotechnology-based engineered particles in biological developments. Also, it highlights the role of epigenetic machinery and redox modulators during the development of diseases. In addition, it provides research on nanotechnology-based applications in tissue engineering, stem cell, and regenerative medicines.

Overall, the book provides an extended platform for acquiring the methodological knowledge needed for today's biotechnological applications, such as DNA methylation, redox homeostasis, CRISPR, nano-based drug delivery systems, proteomics, genomics, metagenomics, bioluminescence, bioreactors, bioremediation, biosensors, etc.

Divided into three sections, the book first highlights some recent trends in applied microbiology used in different areas, such as crop improvement, wastewater treatment, drug delivery, healthcare management, and more. The volume goes on to cover some advances in cellular and molecular mechanisms, such as CRISPR technology in biological systems, induced stem cells in disease prevention, integrated omics technology, and others. The volume also explores the indispensable role of nanotechnology in the precisely modulating intricate functioning of an organism in diagnostic and therapy along its application in tissue engineering and regenerative medicine and in food science as well as its role in ecological sustainability.

This multidisciplinary volume will be highly valuable for the researchers, scientists, biologists, and faculty and students striving to expand their horizon of knowledge in their respective fields.

TABLE OF CONTENTS

Part Part I | 175 pages

Trends in Applied Microbiology

Chapter Chapter 1 | 21 pages
Role of Endophytes in Crop Improvement
By *Bicky Jerin Joseph, A. R. Nayana, E. K. Radhakrishnan* [GET ACCESS](#)
[Abstract](#)

Chapter Chapter 2 | 14 pages
Omics Approach to Understanding Microbial Diversity
By *Shilpee Pal, Arijit Jana, Keshab Chandra Mondal, Suman Kumar Halder* [GET ACCESS](#)
[Abstract](#)

Chapter Chapter 3 | 26 pages
Role of Bioremediation in Wastewater Treatment
By *Iqbal Ansari, Muniyan Sundararajan, Deblina Maiti, Anand Kumar, Jyoti Ranjan Rout* [GET ACCESS](#)
[Abstract](#)

Chapter Chapter 4 | 12 pages
Usage of Engineered Virus-Like Particles in Drug Delivery
By *Sushil Kumar Sahu, Ramakanta Rana, Ashok Kumar Mallik* [GET ACCESS](#)
[Abstract](#)

Chapter Chapter 5 | 42 pages
Novel Microbial Compounds as a Boon in Health Management
By *Shubha Rani Sharma, Rajani Sharma, Debasish Kar* [GET ACCESS](#)
[Abstract](#)

Chapter Chapter 6 | 27 pages
Rise of the Microbial World: An Economic Point of View
By *Binita Dev, R. Jayabalan* [GET ACCESS](#)
[Abstract](#)

Chapter Chapter 7 | 29 pages
Biosafety Principles for Microbial Culture Technologies
By *Vidushi Abrol, Sundeep Jaglan, Shorada Mallubhotla* [GET ACCESS](#)
[Abstract](#)

Part Part II | 246 pages

Advances in Cellular and Molecular Mechanisms

Chapter Chapter 8 | 47 pages
Intracellular Redox Status and Disease Development: An Overview of the Dynamics of Metabolic Orchestra
By *Sharmi Mukherjee, Anindita Chakraborty* [GET ACCESS](#)
[Abstract](#)

Chapter Chapter 9 | 17 pages
Oxidative Stress as a Detrimental Factor in Various Clinical Pathology
By *Priyanka Saha, Anupam Das Talukdar, Rajat Nath* [GET ACCESS](#)
[Abstract](#)

Chapter Chapter 10 | 38 pages
Implications of CRISPR Technology in Biological Systems
By *Kikku Sharma, Souvik Sen Gupta* [GET ACCESS](#)
[Abstract](#)

Chapter Chapter 11 | 14 pages
Revolutionary Approaches of Induced Stem Cells in Disease Prevention
By *Stanzin Ladao* [GET ACCESS](#)
[Abstract](#)

Chapter Chapter 12 | 14 pages
Stem Cell Biology: An Overview
By *Sumit Sidharth* [GET ACCESS](#)
[Abstract](#)

Chapter Chapter 13 | 40 pages
Recent Advances in Imaging and Analysis of Cellular Dynamics in Real Time
By *Chandra Bhan, Pankaj Dipankar, Shiba Prasad Dash, Papiya Chakraborty, Nibedita Dalpati, Pranita P. Sorangi* [GET ACCESS](#)
[Abstract](#)

Chapter Chapter 14 | 57 pages
Integrated Omics Technology for Basic and Clinical Research
By *Kuldeep Giri, Vinod Singh Bisht, Sudipa Maiti, Kiran Ambatipudi* [GET ACCESS](#)
[Abstract](#)

Chapter Chapter 15 | 14 pages
Current State of Malaria Diagnosis: Conventional, Rapid, and Safety Diagnostic Methods
By *Barsa Baisalini Panda, Rupenangshu Kumar Hazra* [GET ACCESS](#)
[Abstract](#)

Part Part III | 232 pages

Nanotechnological Intervention in Life Sciences

Chapter Chapter 16 | 20 pages
Current Perspective of Biofunctionalized Nanomaterials in Biology and Medicine
By *Namita Bhoi, Iswar Baitharu* [GET ACCESS](#)
[Abstract](#)

Chapter Chapter 17 | 29 pages
Nano-System as Therapeutic Means
By *Ananya Ghosh, Anirudha Mukherjee* [GET ACCESS](#)
[Abstract](#)

Chapter Chapter 18 | 41 pages
Recent Developments in Nanoparticle-Mediated Drug Delivery in Therapeutic Approaches
By *Janmejaya Bag, Swetapadma Sahu, Manalisa Mishra* [GET ACCESS](#)
[Abstract](#)

Chapter Chapter 19 | 34 pages
Beneficial Utility and Perspective of Nanomaterials Toward Biosensing
By *Ravindra Pratap Singh, Kshitij R.B. Singh* [GET ACCESS](#)
[Abstract](#)

Chapter Chapter 20 | 21 pages
Benefits of Nanomaterials-Based Biosensors
By *Sourav Mishra, Rohit Kumar Singh, Uday Suryakanta, Bijayananda Panigrahi, Dindyal Mandal* [GET ACCESS](#)
[Abstract](#)

Chapter Chapter 21 | 31 pages
Role of Nanotechnology in Tissue Engineering and Regenerative Medicine
By *Bijayananda Panigrahi, Uday Suryakanta, Sourav Mishra, Rohit Kumar Singh, Dindyal Mandal* [GET ACCESS](#)
[Abstract](#)

Chapter Chapter 22 | 24 pages
Protein-Based Nanosystems as Emerging Bioavailability Enhancers for Nutraceuticals
By *Rahini Samadarsi, Debjani Dutta* [GET ACCESS](#)
[Abstract](#)

Chapter Chapter 23 | 26 pages
Application of Nanomaterials in Environmental Pollution Abatement and Their Impact on Ecological Sustainability: Recent Status and Future Perspective
By *Syed Nikhat Ahmed, Subhashree Subhadarsini Mishra, Jayanta Kumar Sahu, Sabita Shroff, Prajna Paramita Naik, Iswar Baitharu, Sanjat Kumar Sahu* [GET ACCESS](#)
[Abstract](#)