



Book | © 2022

Bio-Nano Interface

Applications in Food, Healthcare and Sustainability

Home > Book

Editors: [Manoranjan Arakha](#), [Arun Kumar Pradhan](#), [Suman Jha](#)

Provides information on economically important topics like use of nanotechnology in bioethanol production and post-harvest technology

Includes effect of interfacial phenomena resulting from nano-bio interactions and describes the interfacial functional groups on mammalian and bacterial cells

Special chapters on the application of nanoparticles in bioremediation and ecological sustainability

9203 Accesses | **13** Citations

Sections

[Table of contents](#)
[About this book](#)
[Keywords](#)
[Editors and Affiliations](#)
[About the editors](#)
[Bibliographic Information](#)

 This is a preview of subscription content, [access via your institution](#).

Table of contents (19 chapters)

Search within book

 
Front Matter [PDF #](#)

Pages i-ix

[Impact of Isotropic and Anisotropic Plasmonic Metal Nanoparticles on Healthcare and Food Safety Management](#)

Nabojit Das, Rayavarapu Raja Gopal

Pages 1-20

[An Introduction to Different Methods of Nanoparticles Synthesis](#)

Rohit Pritam Das, Arun Kumar Pradhan

Pages 21-34

[Classification, Synthesis and Application of Nanoparticles Against Infectious Diseases](#)

Bhabani Shankar Das, Ankita Das, Abhishek Mishra, Manoranjan Arakha

Pages 35-58

[Nanotechnology in Food Science](#)

Rina Ningthoujam, Barsarani Jena, Sabita Pattanayak, Santwona Dash, Manasa Kumar Panda, Rajendra Kumar Behera et al.

Pages 59-73

[Facets of Nanotechnology in Food Processing, Packaging and Safety: An Emerald Insight](#)

Sushrirekha Das, Smita Hasini Panda, Mahidhar Bolem, Nityasundar Pal, Biswa Ranjan Samantaray, Hrudayanath Thatoi

Pages 75-92

[Nanotechnology and Its Potential Application in Postharvest Technology](#)

Barsarani Jena, Rina Ningthoujam, Sabita Pattanayak, Santwona Dash, Manasa Kumar Panda, Bimal Prasad Jit et al.

Pages 93-107

[Nanotechnology Mediated Detection and Control of Phytopathogens](#)

Banishree Sahoo, Sandip Kumar Rath, Sallendra Kumar Mahanta, Manoranjan Arakha

Pages 109-125

[Nanosystems for Cancer Therapy](#)

Sallendra Kumar Mahanta, Manoranjan Arakha

Pages 127-142

[Phytoplankton Mediated Nanoparticles for Cancer Therapy](#)

Priyadarshini Padhi, Manasa Kumar Panda, Yengkhom Disco Singh, Kaushik Kumar Bharadwaj, Kausika Kumar Malik, Binata Nayak

Pages 143-159

[Nanotechnology and Its Potential Implications in Ovary Cancer](#)

Bimal Prasad Jit, Biswajita Padhan, Ashok Sharma

Pages 161-175

[Nanotechnology: An Emerging Field in Protein Aggregation and Cancer Therapeutics](#)

Sonali Jena, Sonali Mohanty, Monalisha Ojha, Kumari Subham, Suman Jha

Pages 177-207

[Bio-nano Interface and Its Potential Application in Alzheimer's Disease](#)

Biswajita Pradhan, Bimal Prasad Jit, Saiendri Maharana, Shankar Ramchandani, Mrutyunjay Jena

Pages 209-224

[Potential of Curcumin Nanoparticles in Tuberculosis Management](#)

Bhabani Shankar Das, Ashirbad Sarangi, Debapriya Bhattacharya

Pages 225-249

[Application of Nanobiosensor in Health Care Sector](#)

Subham Preetam, Lipsa Dash, Suman Sudha Sarangi, Mitali Madhusmita Sahoo, Arun Kumar Pradhan

Pages 251-270

[Bioactive Nanoparticles: A Next Generation Smart Nanomaterials for Pollution Abatement and Ecological Sustainability](#)

Showkat Mir, Nirius Jenan Ekka, Binata Nayak, Iswar Baitharu

Pages 271-285

[Smart Nanomaterials for Bioimaging Applications: An Overview](#)

Kunal Biswas, Avik Sett, Debashis De, Jaya Bandyopadhyay, Yugal Kishore Mohanta

Pages 287-306

[Biology of Earthworm in the World of Nanomaterials: New Room, Challenges, and Future Perspectives](#)

Jayanta Kumar Sahu, Rajendra Kumar Behera, Iswar Baitharu, Prajna Paramita Naik

Pages 307-328

[Bioethanol Production from Agricultural Wastes with the Aid of Nanotechnology](#)

Manisha Mahapatra, Arun Kumar Pradhan

Pages 329-337

[Nanotechnology for Sustainable Bioenergy Production](#)

Yengkhom Disco Singh, Manasa Kumar Panda, Mrinal Kumar Sarma, Rina Ningthoujam, Punuri Jayasekhar Babu, Mohinikanti Das et al.

Pages 339-355

[Back to top](#) ↑

About this book

This book discusses the unique interactions of nanoparticles with various biomolecules under different environmental conditions. It describes the consequences of these interactions on other biological aspects like flora and fauna of the niche, cell proliferation, etc. The book provides information about the novel and eco-friendly nanoparticle synthesis methods, such as continuous synthesis of nanoparticles using microbial cells. Additionally, the book discusses nanoparticles' potential impact in different areas of biological sciences like food, medicine, agriculture, and the environment. Due to their advanced physicochemical properties, nanoparticles have revolutionized biomedical and pharmaceutical sciences. Inside the biological milieu, nanoparticles interact with different moieties to adopt stable shape, size, and surface functionalities and form nano-biomolecular complexes. The interaction pattern at the interface form complexes determines the fate of interacting biomolecules and nanoparticles inside the biological system. Understanding the interaction pattern at the nano-bio interface is crucial for the safe use of nanoparticles in natural sciences. This book rightly addresses all questions about the interaction and the ensuing structure and function of these nano-biomolecular complexes.

This book caters to students and researchers in the area of biotechnology, microbiology, and pharmaceutical sciences.

[Back to top](#) ↑

Keywords

[Bioactive Nanoparticles](#) [Bio-nano Interface](#) [Bio-nano Interactions](#)
[Drug Delivery](#) [Nanomedicine](#) [Nanotechnology](#)
[Back to top](#) ↑

Editors and Affiliations

Centre for Biotechnology, Siksha 'O' Anusandhan (Deemed to be University), Bhubaneswar, India

Manoranjan Arakha, Arun Kumar Pradhan

Department of Life Science, National Institute of Technology Rourkela, Rourkela, India

Suman Jha

[Back to top](#) ↑

About the editors

Dr. Manoranjan Arakha is an assistant professor at the Centre for Biotechnology, Siksha 'O' Anusandhan (Deemed to be University), Bhubaneswar, Odisha, India. He received his doctorate in Life Science from the National Institute of Technology Rourkela, India, in 2017. Subsequently, He pursued post-doctoral research on Bio-Nano interface at University College Dublin, Ireland. His research interests include green synthesis of different metal nanoparticles and moderate their Physico-chemical parameters for antimicrobial and cytotoxic properties. For antimicrobial, he is mainly interested in nanoformulation effective against biofilm-forming and antimicrobial peptide-resistant bacteria.

Dr. Arun Kumar Pradhan is an assistant professor in Centre for Biotechnology, School of Pharmaceutical Sciences, Siksha 'O' Anusandhan (Deemed to be University), Bhubaneswar, Odisha, India. He received his Ph.D. degree in 2016 from the Department of Environment & Sustainability, CSIR-Institute of Minerals and Materials Technology, Bhubaneswar, India. His area of interest is microbial biosurfactants and their various biotechnological applications like the effect of biosurfactant on cancer cells, study of biofilm inhibitory capacity of biosurfactants, nanoparticle approach (liposome) of heavy metal detection, etc. Currently, he is working on the green synthesis of various nanoparticles and clinical applications of biosurfactants to cure different disorders.

Dr. Suman Jha is an associate professor in the Department of Life Science, National Institute of Technology Rourkela, Odisha, India. He received his Ph.D. from the Department of Physical Chemistry-I, Technical University of Dortmund, Germany, in 2009. He completed his post-doctoral research in protein biophysics from the Department of Molecular and Cell Biology, University of Connecticut, USA (2010-2011). Currently, Dr. Jha investigates different nanoformulations for biological applications like in T1DM, Parkinson's, and cancer. His research interests involve studying nanoparticle-biomolecular interfacial interactions, protein-metal ions & protein-protein interactions.

[Back to top](#) ↑

Bibliographic Information

Book Title Bio-Nano Interface	Book Subtitle Applications in Food, Healthcare and Sustainability	Editors Manoranjan Arakha, Arun Kumar Pradhan, Suman Jha
DOI https://doi.org/10.1007/978-981-16-2516-9	Publisher Springer Singapore	eBook Packages Biomedical and Life Sciences , Biomedical and Life Sciences (RQ)
Copyright Information The Editor(s) (if applicable) and The Author(s), under exclusive license to Springer Nature Singapore Pte Ltd. 2022	Hardcover ISBN 978-981-16-2515-2 Published: 28 November 2021	Softcover ISBN 978-981-16-2518-3 Published: 29 November 2022
eBook ISBN 978-981-16-2516-9 Published: 27 November 2021	Edition Number 1	Number of Pages IX, 355
Number of Illustrations 1 b/w illustrations	Topics Biotechnology , Nanotechnology , Biomedical Research , Industrial Microbiology , Pharmaceutics	

[Back to top](#) ↑