

Biopolymers & Natural polymers

From biomass



Cellulose



Polysaccharide

From microbial



P(3HB) Granule



Polyhydroxyalkanoates

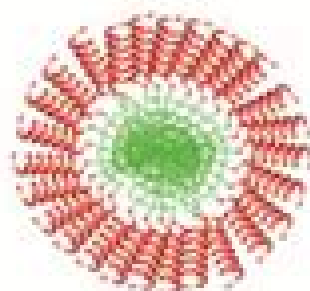


Hyaluronic acid

Polynucleotide

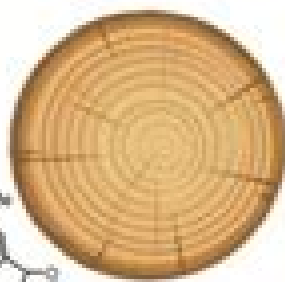
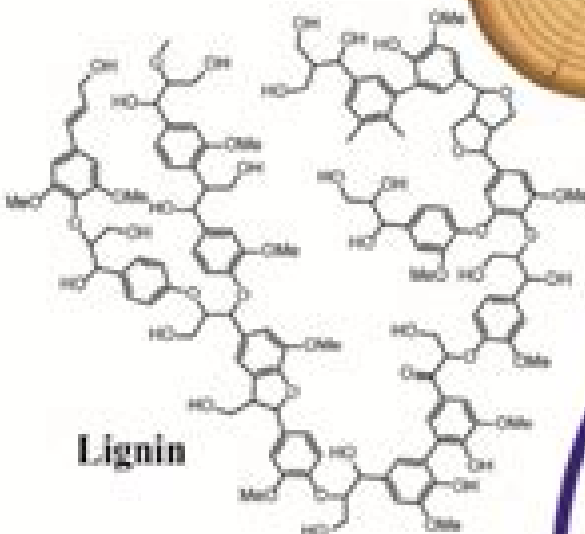


DNA



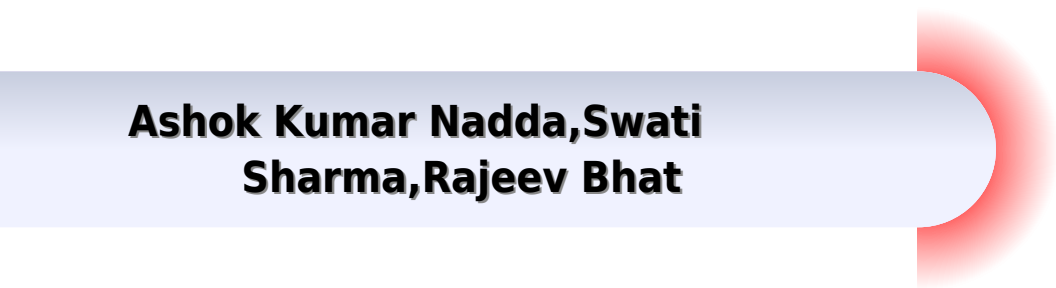
Drug delivery

Lignin



Biopolymers Biomedical And Environmental Applications

**Ashok Kumar Nadda, Swati
Sharma, Rajeev Bhat**



Biopolymers Biomedical And Environmental Applications:

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Biopolymers Jeyaseelan Aravind, Murugesan Kamaraj, 2023-07-24 Sustainable and green eco friendly remediation technologies to tackle environmental issues are currently being developed. This book covers advancements and achievements in the application of tailored biopolymers for green environmental pollution remediation technologies. It covers plant based and animal sourced biopolymers, composites and biopolymer based membrane technology. This book covers all the chapters in the form of a review which gives a comprehensive outlook on each of the topics covered in the chapters, thus quite useful for graduates, researchers and academicians.

Biopolymers for Medical Applications Juan M. Ruso, Paula V. Messina, 2017-02-17 This book presents an experimental and computational account of the applications of biopolymers in the field of medicine. Biopolymers are macromolecules produced by living systems such as proteins, polypeptides, nucleic acids and polysaccharides. Their advantages over polymers produced using synthetic chemistry include diversity, abundance, relatively low cost and sustainability. This book explains techniques for the production of different biodevices such as scaffolds, hydrogels, functional nanoparticles, microcapsules and nanocapsules. Furthermore, developments in nanodrug delivery, gene therapy and tissue engineering are described.

Biodegradable and Biobased Polymers for Environmental and Biomedical Applications Susheel Kalia, Luc Avérous, 2016-01-29 This volume incorporates 13 contributions from renowned experts from the relevant research fields that are related to biodegradable and biobased polymers and their environmental and biomedical applications. Specifically, the book highlights developments in polyhydroxyalkanoates, applications in agriculture, biodegradable packaging material and biomedical field like drug delivery systems, implants, tissue engineering and scaffolds. The synthesis and elaboration of

cellulose microfibrils from sisal fibres for high performance engineering applications in various sectors such as the automotive and aerospace industries or for building and construction The different classes and chemical modifications of tannins Electro activity and applications of Jatropha latex and seed The synthesis properties and applications of poly lactic acid The synthesis processing and properties of poly butylene succinate its copolymers composites and nanocomposites The different routes for preparation polymers from vegetable oil and the effects of reinforcement and nano reinforcement on the physical properties of such biobased polymers The different types of modified drug delivery systems together with the concept of the drug delivery matrix for controlled release of drugs and for antitumor drugs The use of nanocellulose as sustainable adsorbents for the removal of water pollutants mainly heavy metal ions organic molecules dyes oil and CO₂ The main extraction techniques structure properties and different chemical modifications of lignins Proteins and nucleic acids based biopolymers The role of tamarind seed polysaccharide based multiple unit systems in sustained drug release

Nanoscience and Biotechnology for Environmental Applications K M Gothandam, Shivendu Ranjan, Nandita Dasgupta, Eric Lichtfouse, 2019-02-05 This book presents the complete guide for readers to understand the applications and pros and cons of nanotechnology applications in environmental remediation although there are few critical reviews and textbooks available on environmental biotechnology Water pollution has become one of the biggest concerns of the world After the industrialisation and urbanisation environmental pollution has become an enormous concern Water pollution results in biomagnifications by entering the food chain As a result water pollution and its risks need to be considered seriously and solutions need to be researched This volume looks into such topics as bioremediation nanobiotechnology biosensors and enzyme degradation to find solutions to these problems Biopolymer-based Composites for Energy Generation and Storage Satyaranjan Bairagi, Shakeel Ahmed, Mohammad Jawaid, 2025-10-08 Biopolymer Based Composites for Energy Storage and Generation covers the properties and performance of various biopolymers examining their potential applications in batteries supercapacitors and solar cells alongside considerations of their environmental impact economic benefits and associated challenges and limitations Chapters discuss the fundamentals of biopolymers used in the energy field cover their essential properties and performance and feature specific applications including batteries supercapacitors solar cells portable electronics electric vehicles and grid energy storage The book concludes by discussing the role of biopolymers in energy harvesting and generation energy efficiency and conservation It critically examines challenges and limitations considering both environmental impact and economic benefits Research advancements and future directions are also discussed making this a valuable resource for researchers and professionals interested in the application of sustainable materials in the energy sector Explores the properties and performance of various types of biopolymers and biocomposites used in energy generation and storage technologies Describes diverse applications of biopolymer based composites in energy storage and generation ranging from portable electronics and electric vehicles to grid storage Features case studies and techno economic aspects

associated with the utilization of biopolymer based composites for energy storage and generation

Graft Copolymers for Biomedical and Tissue Engineering Applications Rishabha Malviya, Sonali Sundram, 2025-09-12 The revolutionary capabilities of the use of graft copolymers of polysaccharides in tissue engineering and biomedical applications are explored in this new volume covering their production uses and future directions Graft copolymers are innovative materials that show enormous potential for combating many healthcare issues This book demonstrates an immense range of possible potentials presenting groundbreaking work on chitosan based graft copolymers as well as cutting edge research on graft polysaccharides as excipients for solid dosage forms The topics explore green synthesized nanobactericides and the use graft polymers to formulate nanoparticles highlighting the ways that nanotechnology and environmental consciousness are influencing this discipline Detailed discussions on improving biodegradability biocompatibility and the development of smart hydrogels are included as well as research on bone marrow regeneration applications demonstrating the significant role that graft copolymers play in enabling innovative biomedical solutions Exploring the vast potential that polysaccharide based graft copolymers have in biomedical and tissue engineering applications this volume will be a valuable resource for biomedical specialists clinical practitioners pharmaceutical scientists and medical experts

Biopolymers Ashok Kumar Nadda, Swati Sharma, Rajeev Bhat, 2022-05-23 This book emphasizes various challenges and opportunities in biopolymers and identifying their potential applications in various fields including food pharmaceuticals cosmetics and electronics It offers an overview of the environmental related issues regulatory and legislative issues green extraction technologies and sustainability challenges It will be interesting and valuable for researchers working in the related field

Biocomposites Shakeel Ahmed, Saiqa Ikram, Suvardhan Kanchi, Krishna Bisetty, 2018-04-17 Biocomposites formed by a matrix and a reinforcement of natural fibers often mimic the structure of living materials and offer the strength of the matrix as well as biocompatibility Being renewable cheap recyclable and biodegradable they have witnessed rapidly growing interest in terms of industrial and fundamental applications This book focuses on fiber based composites applied to biomedical and environmental applications It presents a comprehensive survey of biocomposites from the existing literature paying particular attention to various biomedical and environmental applications The text describes mechanical designs and manufacturing aspects of various fibrous polymer matrix composites and presents examples of the synthesis and development of bionanocomposites and their applications The book is the first of its kind to present all these topics together unlike most other books on nano biocomposites that are generally limited to their fundamentals different methods of synthesis and applications

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