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Book Review

POLYSACCHARIDES IN MEDICINAL AND PHARMACEUTICAL APPLICATIONS

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In line with the current focus on a sustainable economy, polysaccharides have received a special attention due to the diversity of their resources, non-toxicity, biodegradability, and biocompatibility; they are also renewable sources being capable of chemical modifications. In this order, the book provides a comprehensive overview of researches regarding the use of polysaccharides in the medicinal and pharmaceutical field.

The first chapter, *Configurations, Structures and Morphologies of Cellulose* presents an overview regarding the structure, morphology, sources and physicochemical properties of cellulose. A particular importance is given to micro- and nanostructured cellulose materials, due to their applicability as additives for pharmaceutical formulations, as biocompatible hydrogels or as scaffold materials in tissue engineering.

In Chapter 2, *Hemicelluloses in Pharmacy and Medicine*, a structuring of the sources and the chemical structure of hemicelluloses together with the most interesting applications are presented. The most important properties of hemicelluloses including the controllable biological activity, biodegradability and their ability to form hydrogels are also included in this chapter.

The current applications concerning the fungal exopolysaccharides are summarised in Chapter 3, *Fungal Exopolysaccharides*. Their unique properties of some bioactive fungal exopolysaccharides as immunomodulators, antitumor agents, and effective agents in the treatment of microbial infections and in lowering blood pressure

or cholesterol in humans are presented in this chapter. These properties are correlated with their structure, and they depend on the microorganisms which synthesised them and the conditions of production. The heteropolysaccharides, which are complex compounds made up from different sugar monomers, some of which may be negatively charged, are also included here.

Chapter 4, *Pullulan for Biomedical Uses*, is an overview regarding the structure, rheological properties of pullulan solutions and films, their biological properties and some derivatives in solution. The chemical modifications of pullulan such as carboxymethylation and sulfation are also mentioned in this chapter. The possibility of developing different systems based on micro- and nano-hydrogels, films and multilayer formation for drug delivery is also minutely presented in this chapter.

The use of cellulose in the medical field as membranes in dialysis or blood purification is presented in Chapter 5, *Cellulose and Its Use for Blood Purification*.

Immunomodulatory Effects of Botanical Polysaccharides (Chapter 6) presents the significant therapeutic potential of polysaccharides extracted from mushrooms, algae and higher plants and the future development of novel compounds with medical value.

The antioxidant, mitogenic and antiviral activity, the adjuvant effects, antitumor properties and effects on the leucocyte function are also included in this chapter for these plant-derived polysaccharides.

In Chapter 7, *Pharmaceutical Applications of Cyclodextrins*, the extensive information regarding the physicochemical properties of cyclodextrins and their interest for pharmaceutical applications are summarized. Their ability to form the inclusion compounds with various substances and their high capacity to entrap different active principles are only some aspects of cyclodextrins, included in this chapter, which increase their interest for using the cyclodextrins in the pharmaceutical field.

In *Bioactivity of Chondroitin Sulfate* (Chapter 8) some details about the biological functions of the chondroitin sulfate at the cellular level in treating arthritis are discussed by the authors. This chapter also presents biomaterials containing chondroitin sulfate and its role in improving the biological activity. These materials can be used as scaffolds in cartilage tissue engineering, in wound healing by tissue regeneration or heart valve engineering.

At present, many polysaccharides are used to serve the pharmaceutical needs as carriers for controlled drug release.

A lot of examples of micro- and nanocarriers based on polysaccharides applied in various fields as ophthalmic, respiratory, renal, cardiovascular, digestive, immunologic diseases, cancer therapy, neurologic and endocrine pathology are summarized in Chapter 9, *Micro- and Nanoparticles Based on Polysaccharides for Drug Release Applications*.

Finally, in Chapter 10, *Carbohydrate-Containing Dendrimers in Biomedical Applications*, the implication of dendrimers based on carbohydrates in drug and gene delivery, synthetic vaccines and the prevention of pathological processes caused by bacteria and viruses are presented.

Covering all aspects, the book is a useful instrument for postgraduate students or scientists from the academic and industrial community working with polysaccharides and their possible applications. This book will be appreciated due to overview regarding the use of polysaccharides and their derivatives in the top fields such as medicine and pharmacy.

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