
Preface

Chitosan is a deacetylated derivative of chitin, which is an abundant marine resource that can be obtained from the shells of shrimps or crabs. Chemically, it is a linear polysaccharide composed of randomly distributed β -(1-4)-linked D-glucosamine (deacetylated unit) and N-acetyl-D-glucosamine (acetylated unit). It is a unique natural base polysaccharide whose structural units are similar to those of glycosaminoglycans of the extracellular matrix (ECM). As a result, chitosan has the advantage of being multiply bioactive, which can be taken advantage of in constructing biomaterials of different applications. At the same time, a large number of active hydroxyl and amino groups are available within chitosan molecules. In order to produce various chitosan derivatives, these groups can be set as target sites for chemical modification. Chitosan molecules undergo different types of degradation reactions that result in different degradation products with different molecular weights, some of which will take part in the synthesis of ECM. To optimize the physical, mechanical, and biological properties of these materials, different kinds of chitosan networks are designed and produced, resulting in chitosan-based biomaterials. These biomaterials are used to make a variety of medicines, drug controlled-release carrier, tissue-engineering scaffolds, and immobilized enzymes. With the development of stem-cell technology, chitosan-based biomaterials are also used as scaffolds for stem cells, which will regulate the proliferation and differentiation of cells. Today, more and more papers and patents on chitosan-based materials are emerging. However, very few of these materials can be merchandised, which means that more work needs to be done to fill the gap between research and production. Recognizing this situation, the authors try to summarize progress in the research and development of chitosan-based biomaterials, which they think will not only inspire those who contribute to the research and development of chitosan-based biomaterials, but will also provide the basis for future research.

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