

Chapter 14

Conclusion and future prospects of Chitosan-Based nanocomposites

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Abstract:

Chitosan, as a bionanocomposite has been garnering immense attention and become a centre of comprehensive research, owing to its vast structural possibilities for physio-chemical alterations to produce novel characteristics, functions, and utilizations, especially in the biomedical field. Chitosan is endowed with numerous properties such as biocompatibility, biodegradability, non-toxicity, antimicrobial activity, low immunogenicity, stimuli sensitivity, adjustable physical strength, and water solubility. This ideal biopolymer can be transformed into nanoparticles, nanocapsules, nano-vehicles, fiber meshes, scaffolds, and 3D printed scaffolds. The last decade is a testimony to the enormous potential of chitosan and chitosan-based nanocomposites, as showcased by the legion of research reports displaying many new applications in the field of targeted drug delivery, modern biomedical instruments, and bio-imaging sensors. This chapter unfolds different aspects of chitosan, including its properties and mutations, and focuses on chitosan-based nanocomposites. Emphasis has been laid on the salient biomedical applications of chitosan-based nanocomposites including drug delivery, gene therapy, tissue engineering and regeneration, cancer diagnosis and treatment, and bioimaging amongst various others.

Keywords: Chitosan, bionanocomposite, properties, modifications, biomedical applications

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