Chitosan based biomaterial drug delivery system - An overview

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Abstract:

Chitosan (CS) derivatives are extensively employed in a range of biomedical applications due to their special qualities, which include biocompatibility, mucoadhesion, non-toxicity, and the ability to form gels. They are also promising prospects for the development of films, tablets, and systems based on nanotechnology that could be scaled up commercially and industrially. Only systems requiring a higher solubility and drug release rate can employ CS due to its poor solubility at physiological pH (>6.0). A further drawback of CS is its high degree of swelling and quick water adsorption in aquatic environments, which might cause quick drug release. Through chemical modification of one amino group and two hydroxyl groups on the CS chains, the carboxymethyl moieties will alter the properties of the CS. At various pH values, the water solubility of carboxymethyl chitosan (CMC) is determined by the degree of carboxymethylation. CMC derivatives have the ability to interact with cells to promote wound healing, tissue regeneration, and cell growth. Because of their antimicrobial, emulsion stabilising, and moisture absorption/retention qualities, they are also utilised in the production of cosmetics. The most current of CMC derivatives with biological activity that is antibacterial, anticancer, antitumor, antioxidant, and antifungal in areas like wound healing, tissue engineering, drug/enzyme delivery, bioimaging, and cosmetics will be the main topic of this presentation.

Keywords: Chitosan, drug delivery, drug release, carboxymethyl, tissue engineering.