

Preparation and characterization of hydrophobized oligo-chitosan nanoparticle

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Nanoparticles, prepared by self assembly methods, have been widely investigated for biomedical applications such as drug carriers, drug solubilizers, and imaging agents. Among the numerous synthetic and natural polymers for nanoparticle preparation, chitosan, a natural amino polysaccharide, possesses several advantages such as absence of toxicity, ease of chemical modification, and biodegradation, etc. Chitosan is a biodegradable polysaccharide composed of two subunits, D-glucosamin and N-acetyl-D-glucosamine linked together by (1,4)-glycosidic bonds. In this study, low molecular weight oligo-chitosans, with various molecular weight (3 - 30 KD), were chemically modified by hydrophobic groups of cholesterol and stearic acid. Then, particle size, morphology, critical micelle concentration (CMC) of the hydrophobized chitosan nanoparticles were characterized by dynamic light scattering, atomic force microscope (AFM), and fluorometer, respectively. Finally, biomedical applications of the nanoparticles as drug carriers and gene carriers were investigated.