

# USING NANOPARTICLE AS DRUG DELIVERY SYSTEM CARRIER: A CASE STUDY OF CHITOSAN NANOPARTICLE

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## **Abstract**

*In recent years, nanoparticulate delivery systems are extensively investigated as a drug delivery strategy in the pharmaceutical research. In general, nanoparticles may protect a drug from degradation, enhance drug absorption by facilitating diffusion through epithelium, modify pharmacokinetic and drug tissue distribution profile and/or improve intracellular penetration and distribution. Furthermore, by modulating the surface properties, composition and milieu, the desired release pattern of the drug and its biodistribution can be achieved. Different types of nanoparticles, such as polymeric nanoparticles, solid lipid nanoparticles, ceramic nanoparticles, magnetic nanoparticles, etc., are being developed for various drug-delivery applications. Polymeric nanoparticles can be fabricated from polysaccharides, proteins and synthetic polymers. Nanoparticles made from natural hydrophilic polymers has gained much interest, since they have been proved efficient in terms of better drug-loading capacity, biocompatibility and possibly less opsonization by reticuloendothelial system (RES) through an aqueous steric barrier. Among the available potential natural polymeric nanoparticles, chitosan-based nanoparticles are particularly interesting as drug delivery system carrier, since they hold certain advantages such as biocompatible, biodegradable, non-toxic and mucoadhesive. This paper provides an overview of chitosan-based nanoparticles, including properties, preparation methods, characterizations, and applications. Our on going research projects on the development chitosan nanoparticles for oral delivery system of insulin dan topical delivery system of vitamin are also reported.*

