

عنوان مقاله:

Physical Properties and Stability of Plasmid DNA-Loaded Chitosan-TPP Nanoparticle

محل انتشار:

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خلاصه مقاله:

Chitosan (CS) is a biodegradable natural polymer that has shown potential for gene delivery. Although a number of in vitro studies showed that chitosan and its derivatives have emerged as promising vehicles for efficient non-viral gene and plasmid DNA (pDNA) vaccine delivery, the stability of chitosan/plasmid nanoparticle remain insufficient. In the present study, ionically crosslinked chitosan nanoparticles were formulated with plasmid DNA using the ionic gelation technique with sodium tripolyphosphate (TPP) as a crosslinking agent. We investigate the stability of chitosan/pDNA nanoparticles which was synthesized by this method. Optimization study showed that chitosan to TPP ratios of 1:0.4(w/w) results in the reproducible formation of nanoparticles with good production yields. SEM and DLS analyses revealed a circular shape of the CS/TPP nanoparticles with an average size diameter of 173 nm. The zeta potential of the nanoparticles was + 10.8 mv. In vitro study of pDNA release from CS/TPP nanoparticles revealed no DNA release following incubation of chitosan/pDNA nanoparticles for up to 1 month, in mediums of PBS and acetic acid at pH 4 and pH 7.4. According to the results, ionically crosslinked CS/TPP nanoparticles have the potential to be used as a .biocompatible non-viral gene delivery system with strong stability

کلمات کلیدی:

Chitosan, Gene delivery, Nanoparticles, Ionic gelation

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