

Green Approach towards Synthesis of Chitosan Nanoparticles for in vitro Release of Quercetin

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Abstract : Chitosan, a carbohydrate polymer at nanoscale level has gained considerable momentum in drug delivery applications due to its inherent biocompatibility and non-toxicity. However, conventional synthetic strategies for chitosan nanoparticles mainly rely upon physicochemical techniques, which often yield chitosan microparticles. Hence, there is an emergent need for development of controlled synthetic protocols for chitosan nanoparticles within the nanometer range. In this context, we report the green synthesis of size controlled chitosan nanoparticles by using *Pongamia pinnata* (L.) leaf extract. Nanoparticle tracking analysis confirmed formation of nanoparticles with mean particle size of 85 nm. The stability of chitosan nanoparticles was investigated by zetasizer analysis, which revealed positive surface charged nanoparticles with zeta potential 20.1 mV. The green synthesized chitosan nanoparticles were further explored for encapsulation and controlled release of antioxidant biomolecule, quercetin. The resulting drug loaded chitosan nanoparticles showed drug entrapment efficiency of 93.50% with drug-loading capacity of 42.44%. The cumulative in vitro drug release up to 15 hrs was achieved suggesting towards efficacy of green synthesized chitosan nanoparticles for drug delivery applications.

Keywords : Chitosan nanoparticles, green synthesis, *Pongamia pinnata*, quercetin

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