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DETERMINATION OF *IN VITRO* RELEASE KINETICS OF DOXORUBICIN FROM CHITOSAN AND CHITOSAN-ALGINATE NANOPARTICLES

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At present cancer chemotherapy has become a challenge due to the poor solubility, adverse side effects and resistance phenomenon displayed by many drugs. The research on anticancer nano drug delivery systems has gained a greater importance with their distinctive properties such as; targeted delivery, slow release and the protection of healthy tissues from the drug. Usage of biopolymers in anticancer drug delivery systems has improved extensively due to their biocompatibility, biodegradability, mucoadhesiveness and the ability to form gels. Chitosan, the deacetylated form of chitin, and alginate, extracted from brown algae, are polyelectrolytes which form ionic complexes through electrostatic interactions. These two polymers have wide use in many applications involving delivery of various types of drugs. In this study, two nano composites were synthesized using above two polysaccharides *i.e.* chitosan nanoparticles and chitosan-alginate nano particles. Preparation of both types of nanoparticles was achieved by a two-step method, i.e., oil in water emulsion and ionic gelation. The encapsulation efficiencies (% EE) were determined by measuring the concentration of doxorubicin remaining in the supernatant after centrifugation by fluorimetry. The values of % EE were around 75% and 95% for chitosan and chitosan-alginate nanoparticles respectively. Both nanoparticles were spherical in shape and showed a positive zeta potential. The release of doxorubicin from both systems was monitored using a fluorometer for 100 hours. The total drug release amount for chitosan nanoparticles after 100 hours was 41% and a release of 55% was shown by chitosan-alginate nanoparticles.

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