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Synthesis and identification of cross-linked chitosan/tripolyphosphat/dacarbazine nano-composite

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Various nanocarrier preparations have been designed to improve therapeutic efficacy and reduce toxic side effects. Nanocarriers prospect a continuous, direct, and controlled drug release to the malignant cells selectively with augmented drug localization and cellular uptake. Nanoparticles can be automated to identify malignant cells and give discriminating and precise drug transfer, evading contact through the normal cells [1].Nanoparticles developed from natural polymers like albumin, heparin and chitosan are used to create nanoparticles for the targeted transport of nucleotide-based drugs, oligonucleotide drugs and proteins [2]. Chitosan (CS) is the most important derivative of chitin which is prepared by the alkaline deacetylation of chitin [3]. The ionic gelation of chitosan by the addition of sodium tripolyphosphate (TPP) is used to prepare chitosan nanoparticles. TPP is a small negative ion that contains three negative charges at physiological pH and its non-toxicity favors its medical application. This compound is able to create five ionic cross-linking points with cationic groups of chitosan. These characteristics make TPP one of the best cross-linking agents for preparation of chitosan nanoparticles [4]. In this study, solution Chitosan and dacarbazine (chemotherapy medication) are mixed together in the dark, then combined with tripolyphosphate solution in a water bath. Using FT-IR, SEM-EDS, NANO DRAP, TGA-DTA and XRD techniques, the structural characteristics of the resulting composite, the percentage of drug use on the Pharmaceutical platform and, also the entrapment efficiency are investigated. As a result, Dacarbazine drug with rod morphology is placed on the chitosan/tripolyphosphate nanocomposite.

Keywords: Chitosan , Tripolyphosphat , Dacarbazine

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