Preparation and Application of Nano Chitosan Drug Carriers

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ABSTRACT

The objective of this study was to prepare nano chitosan drug carriers. First, chitosan was dissolved in HCl and the pH of solution was adjusted. Chitosan hydrochloride was obtained after dehydration. The solutions of chitosan-HCl with diclofenac sodium and genipin were prepared. Spray-drying was used to prepare nano chitosan drug carriers containing diclofenac sodium. To evaluate characteristics of these carriers, FESEM, cytotoxicity, permeability, and drug release tests were conducted. The FESEM indicated that the size of carriers had an average size of 300 nm. The FTIR indicated that the samples appeared characteristic absorption peak when containing drugs. When increased the concentration of cross-linking agent in these carriers, the IR absorption peak of amide was decrease. MTT data showed that these carriers with a concentration below 100 ug/mL were non-toxic to Caco-2 cells. In TEER results, sample D has a penetration greater than 50 %. When samples containing moisture, aggregation happened and the size of samples become larger. Hence samples can’t penetrate cell junction successfully. The results of trypan blue assay showed that samples won't harm the cells. The drug release behaviors showed that less than 50 % diclofenac sodium could be release in one hour. With prolonging releasing time, the drug concentration was increasing. Chitosan drug carriers have potential in the application of controlled release.

Keywords : chitosan ; drug carriers ; spray drying ; drug release

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