LS-10-P-3226 Preparation and Characterization of Guar Gum Nanoparticles for Colonic Drug Delivery

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Despite technological challenges polymeric nanoparticles have shown great promise for the development of drug administration and are now viewed as a spy to check cellular machinery so as to combat various dreadful life threatening diseases. Apart from their sub cellular size, biocompatibility with tissue and cells these polymeric nanoparticles hold good promise as an efficient drug deliverers in a controlled and sustained release manner. Guar gum, used in the present investigation, is a naturally abundant non-ionic hydrophilic polysaccharide involving low cost in its processing. Guar gum has emerged as a potential candidate for the same due to its unique drug release retarding property and susceptibility to microbial degradation in the large intestine. In the present study, our focus was on development of a new pharmaceutical formulation for colon targeted drug delivery using guar gum nanoparticles. The drug loaded guar gum nanoparticles were prepared by nano-precipitation method. 5-Fluorouracil, an anticancer agent, was used as a model drug in this study. The nanoparticles were characterized using Scanning Electron Microscopy (SEM) and Transmission Electron Microscopy (TEM). The nanoparticles were found to be 50-100 nm in size and spherical in shape. The uniformity distribution was checked by the Zeta-sizer. In-vitro drug release pattern was studied using HPLC. The results obtained using drug loaded guar gum nanoparticles were found to be quite encouraging for development of new colon targeted drug delivery system. Thus, data obtained could be exploited to reduce the systemic side effects and provide effective and safe therapy in colorectal cancer treatment.

Keywords: Nanoparticles, Guar gum, Drug delivery, 5-Fluorouracil, Colorectal cancer