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Fomulation and characterization of calcium alginate beads loaded with rhodamin B niosomes

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Background and Aims: Delivery of drugs to the systemic circulation through colonic absorption represents a novel mode of introducing enzyme labile drugs such as peptides. In this research the preparation and characterization of novel calcium alginate beads loaded with niosomes was studied.
Methods: Rhodamin B (RB) was used as a model substance and encapsulated in sorbitan palmitate (Span 40) niosomes. The niosomal suspension was then mixed with sodium alginate and dropped into CaCl2 solution. The resultant beads were dried at room temperature and coated with Eudragit 100. Morphological study, in vitro dissolution rate measurement and size analysis was evaluated. In vivo passage through rats' GI tract was observed by animal imager.
Results: Multi-lamellar vesicles (MLVs) were formed in the presence of RB. No release in SGF was observed and the dissolution data in SIF were best fitted with diffusion-based models. The mean small intestinal transit time was found more than 3.5-4 h and RB was released in the colon about 4.5 h after administration in all rats. This is in conformation with the in vitro RB release studies in SGF and SIF.
Conclusions: The results clearly demonstrated that the coated calcium alginate gel beads-entrapped niosome is a potential system for colon-specific drug delivery.

Keywords: Colon-specific drug delivery; Rhodamin B; Calcium alginate