

EVALUATION OF SURFACE ENGINEERED NANOCONSTRUCTS FOR EFFECTIVE MUCOSAL IMMUNIZATION

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ABSTRACT

The objective of the present study is to encapsulate Immunogens (HBsAg) in PCL (A nanosize polymeric carrier) and then to attach Con A on the surface of antigen loaded nanoconstructs using polyethylene glycol (PEG, a biocompatible polymer) as spacer and to target carbohydrate specific receptor that expressed by epithelial mucosal cells (M cells). The developed system was characterized for shape, size and loading efficiency. The *in vitro* release and antigen integrity were also evaluated. Particles were prepared by a double emulsion solvent evaporation method. The Con A decorated PCL nanoparticles of average size 186.16 ± 2.61 nm with a narrow size distribution (PDI: 0.184 ± 0.040). HBsAg antigen was efficiently entrapped in PCL-PEG-Con A (PPC) nanoparticles (entrapment efficiency $40.70 \pm 2.53\%$, loading capacity $16 \pm 2\%$ (w/w). After oral immunization mucosal immunity induction was assessed by measuring cytokine (IL-2 and IFN- γ) levels in the spleen homogenates. The results suggested that PPC nanoparticles elicited strong mucosal, cellular and humoral immune responses and hence could be a competent carrier-adjuvant delivery system for mucosal immunization against Hepatitis B.

Keywords; Oral immunization, HBsAg, Vaccine targeting; Nanoparticles, Con A.