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Development and characterization of LTA appended chitosan nanoparticles for mucosal immunization against hepatitis B

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The present study was aimed at exploring the targeting potential of LTA anchored chitosan nanoparticles specifically to M cell following oral immunization. Chitosan nanoparticles encapsulating hepatitis B surface antigen (HBsAg) were prepared by ionotropic gelation method with tripolyphosphate (TPP) as gelatinizer. Following activation by gluteraldehyde method, *Lotus tetragonolobus* (LTA) lectin was grafted to the surface of chitosan nanoparticles. Anchored chitosan nanoparticles were characterized for shape, size, zeta potential and antigen loading efficiency. The lectinized chitosan nanoparticles exhibited 7-29% coupling efficiency depending upon the amount of gluteraldehyde added. The immune stimulating potential was assessed by measuring anti-HBsAg titer in serum in Balb/c mice. Induction of the mucosal immunity was assessed by estimating secretory IgA (sIgA) level in the salivary, intestinal and vaginal secretions and cytokine (IL-2 and IFN-γ) levels in the spleen homogenates. Furthermore, IgG1 and IgG2a isotype were also determined in order to confirm the T_H1/T_H2 mixed immune response. The lectinized nanoparticles have demonstrated additional higher binding tendency with the bovine submaxillary mucin (BSM) as compared to plain counter parts. The results demonstrated that LTA anchored chitosan nanoparticles elicited strong humoral and cellular responses and hence could be a competent carrier-adjuvant delivery system for oral mucosal immunization against Hepatitis B.

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