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Development of a double phase dosage form for enhanced peptide drug delivery

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Parenteral administration is currently the most utilized route of administration for protein and peptide drugs due to poor intestinal epithelial permeability and digestive degradation. This study focused on developing and evaluating a double phase drug delivery system for oral insulin delivery. Extrusion spheronization was utilized to prepare spherical beads containing insulin as active ingredient and chitosan as muco-adhesive agent. Four other bead formulations were also prepared by means of extrusion spheronization, each containing a different drug absorption enhancing agent namely *Aloe vera* whole leaf, *Aloe vera* gel, a bile salt mixture (which consisted of 50% sodium cholate acid and 50% sodium deoxycholate) and a single bile salt (namely sodium glycocholate). The physical and muco-adhesive properties of the different bead formulations were evaluated. Beads containing insulin were mixed with each of the bead formulations containing an absorption enhancer and then loaded into hard gelatin capsules to prepare four different 'double phase drug delivery systems'. The insulin delivery performance of these double phase drug delivery systems was evaluated across excised pig intestinal tissues in a Sweetana-Grass diffusion apparatus. All the bead formulations exhibited acceptable physical properties and showed relatively narrow particle size distribution values. Inclusion of chitosan pronouncedly improved the muco-adhesive properties of the beads. Although all the double phase drug delivery systems showed enhanced transport of insulin across the excised pig intestinal tissues, the beads containing *A. vera* whole leaf caused a statistically significant increase in insulin transport when compared to that of the control group (insulin alone).

Biography

Josia Hendrik Hamman has completed his PhD in Pharmaceutics at the North-West University in 2001. He is currently a Research Professor and has published more than 65 papers in reputed journals. He has successfully supervised 10 Doctoral students and 30 Master's students and has been serving as an Editorial Board Member of 3 scientific journals.

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