# DEVELOPMENT AND EVALUATION OF SYNBIOTIC MICROSPHERES USING INULIN AND *LACTOBACILLUS PLANTARUM*

**Keywords:** Inulin; *Lactobacillus plantarum*; mesalamine; symbiotic; microspheres

**Aim:** To prepare and evaluate synbiotic microspheres with the pH-dependent colon-targeted drug delivery system

**Objectives:** To develop synbiotic microspheres containing inulin, *L. plantarum,* and mesalamine; to coat microspheres with Eudragit S100 for extended drug release; to evaluate the developed microspheres

**Methodology:** Microspheres were prepared by an ion-exchange method (Fig.1). Furthermore, these microspheres were coated with Eudragit S100 by a simple dipping method. Formulations were evaluated for viability counts, drug content, and *in vitro* release of drugs and probiotics. *In vitro* drug and probiotic release studies were carried out in three different media (Hydrochloric acid buffer pH 1.2, phosphate buffer pH 6.8, phosphate buffer pH 7.4) sequentially using the USP Apparatus II.

The macroscopic structures of the coated microspheres were examined by scanning electron microscopy.

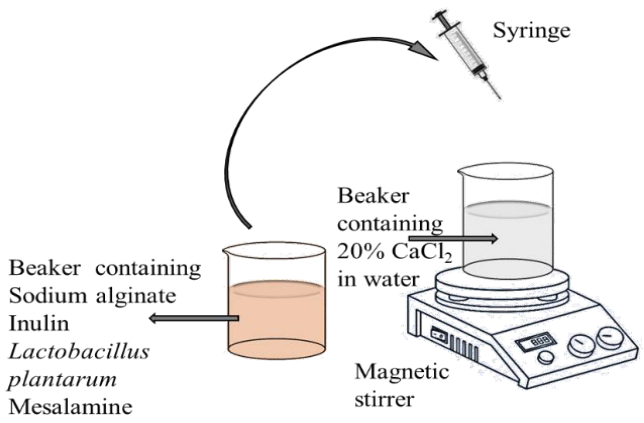


**Fig. 1:** Digramattic representation of preparation of microspheres by ion-exchange method

**Results and Discussion:** The *in vitro* drug release of the F5 formulation (uncoated) and F6 formulation (coated) were found to be 94.55% and 91.87% respectively, after 10 h in phosphate buffer pH 7.4 (Fig. 2). The *in vitro* probiotic release of the F5 formulation (uncoated) and F6 formulation (coated) were found to be 28.82% and 11.17% respectively, after 6 h in phosphate buffer pH 6.8. It shows that the Eudragit S100 coating provides a controlled release of both the drug and probiotic in contrast to the F5 formulation.

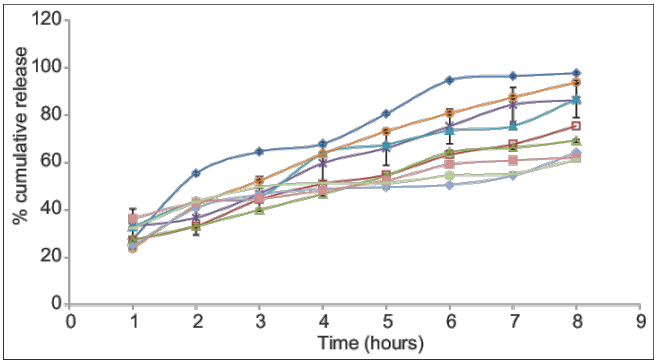


**Fig. 2:** *In vitro* release profile of various batches [Error bars represent standard deviation of n=3. C-300 (-◊-); H300 (-□-); H1:1 (-Δ-); H1:3 (-×-); H1:5 (-▲-); H1:7 (-○-); H3:1 (-♦-); H5:1 (-■-) and H7:1 (-●-)]

**Conclusion:** Synbiotic microspheres with Eudragit S100 coating can be a convenient methodology for extended colon-targeted drug delivery.

**Major References:**


- M.B. Pimparade, *et al.*, Development of taste masked caffeine citrate formulations utilizing hot melt extrusion technology and *in vitro-in vivo* evaluations, Int. J. Pharm., 2015 (487) 167–17.
- N.H. Cnubben, *et al.*, Comparative *in vitro-in vivo* percutaneous penetration of the fungicide ortho-phenylphenol, Toxicol. Pharmacol., 2002 (35) 198–208.