

# PREPARATION AND CHARACTERIZATION OF MICROSPHERES UTILIZING RATE-CONTROLLING MEMBRANES FOR THE MANAGEMENT OF DIABETES MELLITUS

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## ABSTRACT

The present research work aimed at the formulation of film-coated microspheres incorporating glibenclamide drug and their evaluation for the management of diabetes mellitus (DM). Microspheres were prepared by solvent evaporation methodology by the usage of ethyl cellulose as polymer, ethanol and dichloromethane as solvents and Tween 80<sup>®</sup> as a non-ionic surfactant. The film-coated membrane was prepared by pan coating method, incorporating ethyl cellulose, isopropyl alcohol, diethyl phthalate and sodium lauryl sulfate. This film membrane was coated on microspheres with the help of a spray gun. The efficiency of entrapment of the film coated microspheres of F5\* batch, among different formulations, is highest and comes out to be in the range of  $76.65 \pm 0.58$ . The percentage yield was observed to be  $73.32 \pm 0.14$ . Morphological studies conducted by scanning electron microscope show spherical microspheres of uniform size. *In vitro* drug release study conducted of the coated microspheres of glibenclamide shows the highest amount of release of 97.44% in the F5\*batch. The best-fit model was determined by the highest  $R^2$  value. Further, the developed formulation helps in reduction in dose dumping, with better patient compliance, and also masks the bitter taste of the drug.