A large number of drug delivery systems are presently available to treat variety of colon infections. However, therapeutic efficacy of the drug is frequently diminished due to its inability to reach the site of action and maintain stable effective concentration for desired period of time because of altered bowel motility.

The present research work was aimed to overcome this problem. Microsponges based colon specific drug delivery system(s) was expected to effectively target bioactive compounds and increase residence time as well.

This study encompasses preparation and evaluation of microsponges based colon specific tablet formulations. Initially, microsponges of dicyclomine and paracetamol were prepared by quasi-emulsion solvent diffusion method using eudragit RS 100 and eudragit S-100. The reason for preparing microsponge due to the fact that, drug carrier systems less than 200 μm may efficiently be taken up by the macrophages present in colon tissue, thus exhibit effective localized drug action at the desired site. A subsequent increase of residence time that may be postulated for microsponges as compared to existing drug delivery systems may allow dose reduction and enhance therapeutic effect. Another reason for preparing microsponges was their sponge like texture that can easily be compressed by direct compression for producing mechanically strong tablets.

Then core tablets of microsponges were prepared by direct compression method and were compression coated with pectin:HPMC mixture. The reason for selecting pectin was its biodegradation in the colon by colonic flora. HPMC is reported to increase the mechanical strength of the tablet coat and helped in maintaining its integrity during its sojourn in the gastro-intestinal tract.

Antispasmodic drug have traditionally formed the basis of treating irritable bowel syndrome. Dicyclomine an anticholinergic drug, has direct smooth muscle relaxant action in addition to its antispasmodic action. Plasma half-life of dicyclomine is 4-6 h. Dicyclomine which is commonly used for the treatment of irritable bowel syndrome, is associated with number of side effects including the most serious one i.e. heat stroke. To control the rise in body temperature, antipyretic drugs are generally administered. The most commonly used drug for this purpose is paracetamol. Paracetamol (PCM), an antipyretic and analgesic drug which has a short half life about 1-4 hours in plasma. Paracetamol may reduce rise in body temperature and
abdominal pain as well. Paracetamol is associated with many contraindicative manifestations including hypertension, allergic reaction.

**AIM OF THE PRESENT RESEARCH WORK:**

The present study was aimed at developing and characterizing microsponge based novel colon specific drug delivery systems containing dicyclomine and paracetamol for the treatment of IBS to achieve following objects:

- To overcome potential side effects of dicyclomine and paracetamol and enhancing their therapeutic effectiveness.
- To develop superior formulation with pronounced targeting potential of drugs to colon as compared to conventional delivery systems.

**PLAN OF WORK**

Exhaustive Literature survey through journals and e-journal

→ Procurement of Drug(s), and Excipient(s)

→ Preformulation studies

→ Preparation and optimization of microsponges

→ Development of colon specific formulation(s)

→ In vitro and stability studies of promising formulations