3. AIM AND OBJECTIVES:

Site-specific drug delivery to the colon is considered for the development of drug delivery systems that are able to release drugs specifically in the colon in a predictable and reproducible manner. The importance of site specific drug delivery to colon is for the treatment of diseases associated with the colon, reducing the side effects and reducing the dose. There are four types of drug delivery systems for targeting the drug to the colon i.e. pH dependent systems, time dependent systems, pressure controlled system and microbially triggered systems. All the systems have their merits and demerits. Microbially triggered system is highly advantageous due to considerable variability in the \textit{in vivo} performance in time dependent, pressure controlled system and pH dependent systems. Therefore, efforts are being made by the researchers to explore the colonic microflora for targeting drugs to colon.

The aim of present investigation is to explore the potential of natural polysaccharides in modified or cross-linked form for microbially triggered colonic delivery of drugs. Natural polysaccharides are widely used for drug delivery because of large number of derivatizable groups, a wide range of molecular weights, varying chemical compositions, biodegradability, high stability and non toxicity. There occurs wide range of bacterial enzymes present as microbial flora in the colon. These colonic bacterial enzymes are capable of degrading a variety of polysaccharides present in the diet that are not affected either in the stomach or in the small intestine. These non-toxic and biodegradable polysaccharides have the potential of delivering drugs specifically to the colon.

Polysaccharides include naturally occurring polysaccharides obtained from plants (Guar gum, Inulin, pectin), animals (Chitosan, Chondroitin sulphate), algae (Alginates) or microflora (Dextran). These polysaccharides are fermented by colonic microflora. As, these polymers are hydrophilic and soluble in acidic media, they must be made water insoluble and acid resistant by cross-linking or hydrophobic derivatization. Physical or chemical cross-linking of the polymers can enhance the water/acid stability of natural polysaccharides to form swellable hydrogels.

In view of above, it can be suggested that natural polysaccharides cross-linked with other polymers or in modified form can be used to protect the drug from physiological environment of stomach and small intestine. Therefore, cross-linking modified or unmodified natural polysaccharides with other polysaccharides will be used to formulate solid dosage form of representative drug being used for targeting drugs to colon.