This research work entitled “Evaluation and Optimization of Mucoadhesive Drug Delivery of Famotidine with polysaccharide isolated from Hibiscus esculentus Linn.” has been carried out to exploit natural polysaccharide for efficacious and cost effective delivery of the model drug Famotidine. The present work and its experimental findings were drafted into a thesis which has been divided into seven chapters those are presented in order. These chapters cover all the aspects of our research work.

Chapter 1 of this thesis covers with the general introduction to novel drug delivery systems and Mucoadhesive drug delivery systems. This chapter includes different approaches and methods to design novel Mucoadhesive drug delivery systems including the factors and evaluation parameters for drug delivery systems. The chapter also provides a brief overview about statistical optimization methods of pharmaceutical formulations, the plant profile and the drug profile.

Chapter 2 deals with review of literature supporting the present research work. A brief summary of the scientific literatures surveyed during this research work have been presented.

Chapter 3 covers the basic aim and objectives of present research work. This includes a brief description of the approaches used to achieve the objectives.

Chapter 4 describes the experimental works, result and discussion of extraction and purification of polysaccharide from Hibiscus esculentus and it’s cross-linking. This chapter describes the mucoadhesion characteristics of Hibiscus esculentus and its cross-linked derivative.
Chapter 5 presents the details of formulations and optimization aspects of mucoadhesive tablets prepared with *H. esculentus* polysaccharide and its cross-linked derivative. The statistical tools used for optimization give formulations with very high desirability. Mucoadhesive properties of the prepared tablets are presented and the drug release kinetics was assessed for formulated mucoadhesive tablets.

Chapter 6 elaborates in vivo studies performed for mucoadhesive tablets consists of *Hibiscus esculentus* polysaccharide (HEP) and Cross-linked *Hibiscus esculentus* polysaccharide (CHEP). In vivo residence time was studied by X-Ray radiographic and Gamma Scintigraphic imaging techniques. Pharmacokinetic parameters of optimized tablets were determined and level ‘A’ correlation was attempted between in vitro drug release and in vivo plasma concentration.

A list of publications with papers published based on this research works have been presented at the end of this thesis.