PREFACE

Colon cancer is one of the fourth most disastrous cancer and causes mortality and morbidity worldwide. Colon cancer-associated death is mostly found in western countries due to changes in their habitual lifestyle and food habit. In recent years more than 66,000 cases of colon cancer are also reported in India. Several types of natural and synthetic drugs have been used as a chemotherapeutic agent for the treatment of colon cancer but they have been associated with lots of biochemical side effects which predominantly destroy the healthy cells of patients.

Capecitabine is one of the potent chemotherapeutic agent widely used for several decades for the treatment of colon cancer. The major challenges related to oral administration of capecitabine is attributed due to the short plasma half-life, rapid rate of elimination, high dose of capecitabine is needed twice per day, unwanted dose-related toxicity like bone marrow depression, cardiotoxicity, diarrhea, nausea, and dermatitis, etc. Keeping this view, the present study focused on the development of a natural polymer gum odina- sodium alginate based capecitabine loaded microsphere for the treatment of colon cancer.

The subject matter of the thesis has been divided into several chapters containing the development of gum odina- sodium alginate based capecitabine loaded microsphere, optimization of formulations, physicochemical characterizations, and biological evaluation of

formulation and *in vitro* and *in vivo* studies of optimized formulation to investigate the role of the formulated microsphere as an ideal formulation for the treatment of colon cancer.