Preface

Cardiovascular disease is a class of diseases that involved by the heart or blood vessels (arteries, capillaries and veins). Cardiovascular disease refers to any disease that affects the cardiovascular system, principally cardiac disease, vascular diseases of the brain, kidney and peripheral arterial disease. The causes of cardiovascular disease are diverse but atherosclerosis and/or hypertension are the most common. Cardiovascular disease is the leading cause of deaths worldwide, though since the 1970s. Cardiovascular mortality rates have declined in many high-income countries. At the same time, cardiovascular deaths and disease have increased at a fast rate in low and middle-income countries. The people suffering with cardiovascular disease need to take more number of drugs with repeated administration. This causes the patient non compliance and some time may lead to the severe adverse affects. Sustaining the drug release of these drugs may improve the patient compliance, reduce the plasma drug fluctuations and limit the adverse reactions. Giving more therapeutic benefit by changing the dosage forms and site specific dosage form gives more advantageous to the patients.

In the present study two cardiovascular drugs such as Losartan potassium and Clopidogrel were selected to develop the site specific extended release formulations. Losartan potassium showed the extensive hepatic metabolism hence buccal and mucoadhesive drug delivery systems gives potential advantages. The literature showed some research on the buccal films and buccal tablets of Losartan potassium but not reported the bi layer systems for the buccal drug delivery. In the present study aimed at developing the bi layer buccal delivery of the Losartan potassium.

The drug Clopidogrel showed the site specific absorption of the drug, the literature reported the floating and sticking drug delivery systems of the Clopidogrel. Hence the present study aimed at developing the mucoadhesive microspheres and mucoadhesive mini tablets for better therapeutic activity.

The formulations were prepared by using various rate controlled polymers such as cellulose derivatives, Carbopol, Natural gums, Natural polymers such as pectin and polyethylene oxides. Formulations and processing parameters were developed and optimized in order to achieve the desirable rate of drug release from each drug delivery system. Various physico-chemical properties for the films, tablets, granules and microspheres were studied with an aim to commercialize final product.
*In vitro* dissolution and *in vivo* radiographic image analysis were conducted on selected formulations. Accelerated stability studies on some selected formulations were conducted as per ICH guidelines.

This research study provided useful information on Preformulation and formulation optimization of the cardiovascular drugs during development of controlled drug delivery systems containing various rate controlling polymers.