3. SCOPE OF THE STUDY

Pancreatitis is a painful disease of the pancreas due to overwhelming response given by proinflammatory cytokines produced at the site of initial mild injury in the cells of pancreas. Alcohol abuse is the major cause and high fat diet (HFD) is the potentiating factor of pancreatitis. Currently, pancreatitis and its complications are treated by drugs which can only reduce the pain and maintain the electrolyte balance. As the mortality due to pancreatitis keep increasing every year, new therapeutic drugs with fewer side effects need to be investigated to meet out the demand.

Ayurvedic system of medicine is the natural boon to human population which provides natural and harmless protection against major ailments. The phytonutrients formed as secondary metabolites of plants and plant products consumed in the diet, play important role in maintaining good health. Currently, a vast number of research is focused on identifying the medicinal value of plant extracts, and their isolated compounds.

There are many medicinal plants which are traditionally used to treat inflammation related disorders including arthritis and gastrointestinal complications. The fruits of many such plants have found to contain anti-inflammatory compounds. In this regard, the fruits of Emblica officinalis are used traditionally for various ailments but the scientific validation is not yet established. Rutin is the major flavonoid present in Emblica officinalis and shown to have therapeutic value.

The present study has been planned to evaluate the anti-inflammatory property of Emblica officinalis fruit extract and rutin, a rich flavonoid present in the fruit. Once the medicinal property is confirmed, it is essential to study the toxicity profile and the mode of action. As the Nod-like receptor pyrin domain containing 3 (NLRP3) inflammasome plays an important role in triggering inflammation in pancreas, any new drug need to be evaluated for its modulating action on this protein complex. So, the influence of methanolic fruit extract of Emblica officinalis or rutin on the gene and protein level expressions of NLRP3 inflammasome and its components were investigated.
Since the major causes of human pancreatitis are alcohol abuse and gallstone diseases associated with modulated cholecystokinin activity, any drug to be recommended for pancreatitis need to be tested against different experimental models comprised of these factors. Hence two experimental models have been used in the study.

3.1 Major objectives of the study

1. To identify major phytonutrients, flavonoids, terpenoids, alkaloids, and phenolic compounds in the MEEO.

2. To assess the acute and chronic toxicity profile of the test drugs in male albino Wistar rats.

3. To determine the inflammation reducing effect of MEEO/rutin in rats treated with ethanol and high fat diet.

4. To test the efficacy of MEEO/rutin as a therapeutic agent against pancreatic inflammation induced by administering ethanol and cerulein.

5. To study the influence of MEEO/rutin on the components and functions of NLRP3 inflammasome which mediate the activation of caspase-1 and formation of active proinflammatory cytokines.

The expected outcome of the study is a scientific validation of *Emblica officinalis* fruit extract and rutin for the anti-inflammatory activity.