AIM:
Fabrication, Characterization and Pharmacological evaluation of Dual loaded nanoparticles containing hepatoprotective agent to overcome limitations of conventional hepatoprotective agent.

OBJECTIVES:
The liver is the second largest organ in the body, and is often seen as the most important one. The liver receives a dual blood supply with about 20% of blood coming from the hepatic artery and 80% from the portal circulation. The blood flow to the liver is around 20 to 25% of the total cardiac output.

Toxins, infectious agents, medications, and serum inflammatory mediators may result in a diverse range of disease processes, leading to loss of normal histological architecture, reduced cell mass, and loss of blood flow. Consequently, functional liver capacity may be lost.

Efforts have been made to search for effective hepatoprotective agents. However, no effective hepatoprotective therapies are available until now. Therefore, the prevention of liver diseases has a great significance both in theory and in practice.

Herbal drugs play a vital role in the treatment of hepatic disorders. In the absence of reliable hepatoprotective drugs in modern medicine, a number of medicinal plants and their formulations are used to cure hepatic disorders in traditional systems of medicine in India.

There are numerous plants and traditional formulations available for the treatment of liver diseases. About 600 commercial herbal formulations with claimed hepatoprotective activity are being sold all over the world.

Around 190 phytoconstituents isolated from 110 plants belonging to 55 families have been reported to possess hepatoprotective activity. In India, more than 93 medicinal plants are used in different combinations in the preparations of 40 patented herbal formulations. However, only a small proportion of hepatoprotective plants as well as
formulations used in traditional medicine are pharmacologically evaluated for their safety and efficacy. Some herbal preparations exist as standardized extracts with major known ingredients or even pure compounds which are being evaluated. **However, the major limitations of most hepatoprotective agents are lack of regeneration of hepatic cell poor aqueous solubility and bioavailability and which contribute to reduced hepatoprotective activity and increased toxicity.**

In this present study the major goals in designing dual loaded nanoparticles as a delivery system are to control particle size, surface properties and release of pharmacologically active agents in order to achieve the site-specific action of the drug at the therapeutically optimal rate and dose regimen.

- To prepare 2-3 polymeric dual loaded nanoparticles formulations of hepatoprotective agent.
- To characterize the prepared dual loaded nanoparticles such as size, surface morphology, zeta potential, drug encapsulation, in-vitro drug release, solubility etc.
- To establish various in-vitro antioxidant property of prepared dual loaded nanoparticles.
- To establish in-vivo hepatoprotective properties of prepared nanoparticles in suitable animal models.
- To evaluate in-vivo pharmacokinetic parameters of prepared nanoparticles in suitable animal models.
- To establish various toxicity studies of prepared nanoparticles.
- To establish stability of prepared nanoparticles.