CHAPTER- 3 RESEARCH ENVISAGED

AIMS AND OBJECTIVES:

Oral route has been the major route of drug delivery for the chronic treatment of many diseases. However, oral delivery of 50% of the drug compounds is hampered because of the high lipophilicity of the drug itself. The oral delivery of such drugs is frequently associated with implications of low bioavailability, high intra- and inter subject variability, and lack of dose proportionality. To overcome these problems, various formulation strategies are reported in the literature including the use of surfactants, cyclodextrins, nanoparticles, solid dispersions, micronization, lipids, and permeation enhancers. In this project, much attention has been focused on lipid based formulations with particular emphasis on Self-Microemulsifying Drug Delivery Systems (SMEDDS) to improve oral bioavailability of lipophilic drugs.

Keeping these aims in mind, two poorly water soluble hypertensive drugs, Valsartan and Olmesartan were selected for the present study, mainly because hypertension is an important risk factor for cardiovascular morbidity and mortality in the industrialized countries. Hypertension is associated with the development of congestive heart failure

The following objectives were planned for the study.

1. **Solubility:** To improve solubility of selected drugs.
2. **Dissolution rate:** Due to low solubility dissolution rate of these drugs are also slow. Hence by increasing solubility, to increase the dissolution rate.
3. **Stability:** System should be stable under different condition. To impart thermodynamic stability to the system.
4. **Bioavailability:** These poorly water soluble drugs have poor bioavailability. Therefore to improve the bioavailability of selected drugs with a new promising approach.
5. **Toxicity:** To reduce dose of drug and thereby reduce toxicity

OBJECTIVES:

- Selection of excipients for Self-Microemulsifying Drug Delivery System (SMEDDS)
- Incorporation of selected drugs into oil globules of Microemulsions

- Development of stable SMEDDS

- Optimization of various parameters in order to obtain most suited SMEDDS

- Characterization of prepared SMEDDS like particle size, zeta potential, viscosity, conductivity to meet the requirements so as to deliver the drugs by oral route.

- Comparative stability studies of prepared SMEDDS to select final formulation for *in vitro- in vivo* study.

- *In vitro* evaluation of prepared SMEDDS to check the release profile of prepared SMEDDS across the dialysis bag membrane.

- *Ex vivo* evaluation of prepared SMEDDS to check the permeability of prepared SMEDDS across the intestinal tissue.

- *In vivo* evaluation in animal models to determine efficiency of prepared SMEDDS for bioavailability enhancement.