5. SUMMARY

Orlistat is successfully formulated by using liquisolid drug delivery and self-emulsifying drug delivery techniques to overcome problems associated with Orlistat. In preformulation study, Orlistat was characterized for its physical and chemical properties such as its solubility, melting point and absorption maxima. The purity of Orlistat was confirmed by the FTIR and DSC studies. From the study, it was found that Orlistat sample obtained was pure. The solubility of Orlistat in Natural oils, surfactants and co-surfactants was studied to select suitable solvent/vehicle system for the Orlistat. The UV spectroscopic method for Orlistat has been developed which was simple and suitable. The compatibility of Orlistat with excipients was verified by DSC and FTIR studies and which was found to be compatible with excipients used in the formulation. The liquisolid drug delivery system and self-emulsifying Orlistat were prepared. A $3^2$ factorial design was employed to formulate and optimize the LSDDS and SEDDS of Orlistat. The effects of different independent variables on dependent variables were studied for all nine batches.

In case of LSDDS, batch with good flow characteristic, hardness, and % cumulative drug release and minimum tablet weight were selected as a optimized batch and subjected for further study whereas in case of SEDDS batch with minimum globule size and emulsification time were selected. Optimized liquid SEDDS formulation was subjected for the freeze-drying to have better stability, which was compressed into the tablet. These optimized batches were subjected for the evaluation. Optimized formulations were evaluated for different parameters FTIR, DSC, SEM, TEM, in vitro drug release study and in vitro enzyme inhibition study followed by pharmacodynamic study.
From the evaluation, it was observed that the Orlistat was successfully incorporated into the formulation. *In vitro*, drug release study, it was noticed that the optimized formulations showed better drug release than the marketed formulation when compared. The developed formulations were tested for their lipase inhibition potential. Optimized LSDDS and SEDDS formulation showed highest rate and extent of lipase inhibition than the marketed formulation, which confirmed increased drug release, and dissolution of poorly soluble Orlistat.

In pharmacodynamic study, it was observed that the animal groups treated with the optimized liquisolid tablet and self-emulsifying Orlistat tablet was significantly reduced body weight and lipase activity in the wistar rat when compared with the marketed formulation and the diseased group. Thus, the optimized formulations were showed better lipase inhibition potential than the marketed formulation.