1.6. Aim and scope

Successful oral delivery of insulin, can greatly improve the efficacy of treatment of diabetes mellitus. Some significant advances have been made in the recent past that has led to better ways of addressing the challenges of oral insulin delivery.

Use of nanoparticles-oily vehicle combination has been proposed as a promising alternative for oral insulin delivery. Nanoparticles dispersion systems effectively address some of the key challenges in insulin delivery. However, better understanding of how the insulin-loaded nanoparticle formulations function is desired for developing better ways to enhance oral bioavailability of insulin.

The overall goal of this work was to evaluate the first pass metabolism of oral insulin in normal and streptozotocin-intoxicated rats. The specific goals of this research are outlined below:

1) Preparation of insulin-loaded nanoparticles formula for oral delivery of insulin.

2) Pharmacological evaluation of oral insulin formula on diabetic and normal rats.

3) Investigation of the mechanisms of absorption and transport of insulin-loaded nanoparticles preparation across the intestine using the everted gut sac model and in situ intestinal perfusion technique.

4) Determination of the level of insulin, which is metabolized in liver using in situ liver perfusion technique and isolated hepatocytes culture on diabetic and normal rats.

5) Examination the inhibitory effect of bacitracin on insulin degradation using isolated hepatocytes model.