5. PLAN OF WORK

5.1 Design of Plan of Work Based on the Literature Review

a. Selection and procurement of drug and excipients.

b. Preformulation studies of drug and excipients
   - Preformulation studies will be carried out for drug & excipients: (Melting point, solubility, particle size and shape, calibration curve, FTIR, DSC etc.)
   - Compatibility study between drug and excipients using FTIR spectroscopy

c. Formulation of nanoparticles by suitable statistical approach.
   - Effect of the formulation variables on the method of formulation
   - In-vitro evaluation of nanoparticles for % yield, drug content and in-vitro release study etc.
   - Treatment of the dissolution data obtained with different prepared batches of formulations with kinetic release equations.

d. Optimization of the selected variables in the process based on the results of the preliminary study and optimization of formulation.

e. Aging study of the optimized batch amongst all prepared formulations.

f. In Vivo study of optimized formulations.

g. Thesis write up including results, discussion and conclusion

5.2 Selection and Procurement of Drug and Excipients

- Selection of drug:
  After extensive literature review bisphosphonate category of drugs for osteoporosis treatment were selected for the research work.

- Selection of excipients:
  After extensive literature review, some of the most commonly used polymers like, chitosan, sodium tripolyphosphate (TPP), sodium alginate, albumin, calcium chloride, stearic acid, Poly Vinyl Alcohol have been selected for the preparation of nanoparticles. (Any of the suitable polymers may be used for the preparation of nanoparticles and SLN).

- Procurement of drug & excipients:
  - The drug Alendronate Sodium was obtained as a gift sample from SUN PHARMACEUTICALS, VADODARA. Risedronate Sodium was purchased from MANUS AKTTEVA, AHMEDABAD.
- Various other excipients like chitosan, sodium TPP, sodium alginate, calcium chloride, bovine serum albumin (BSA), stearic acid, PVA were made available from the department.