

#### **4. Plan of Study**

##### **4.1. Development of Silver sulfadiazine loaded solid lipid nanoparticles and DNase-**

I enriched chitosan gel for the effective management of biofilm associated with wounds.

- i. Preparation and optimization of SSD-SLNs
- ii. Particle size, polydispersity index and zeta potential analysis
- iii. Scanning electron microscopy (SEM)
- iv. In-vitro release study
- v. Drug-excipient compatibility study
  - a) Fourier transform infrared spectroscopy (FT-IR)
  - b) Differential scanning calorimetric (DSC) study
  - c) Powder X-ray diffraction (PXRD) study
- vi. Bacterial strain and growth condition
- vii. Minimal inhibitory concentration (MIC) assay
- viii. Anti-Biofilm activity of SSD-SLNs
- ix. Determination of toxicity on Human Dermal Fibroblast
- x. Preparation of SSD-SLNs loaded chitosan gel
- xi. Characterization of SSD-SLN loaded chitosan gel
  - a) Texture profile analysis (TPA)
  - b) In-vivo wound healing studies on rat model
- xii. Statistical analysis.

**4.2.** Development of the Alginate lyase immobilized chitosan nanoparticles of the ciprofloxacin to enhance antimicrobial activity against mucoid *P. aeruginosa* biofilm associated with cystic fibrosis.

- i. Preparation of inhalable powder
- ii. In vitro aerodynamic property of dry powder
- iii. Identification of AgLase Conjugation
- iv. Enzyme activity assay of AgLase bearing NPs
- v. Particle Size (PS), polydispersity index (PDI) and zeta potential (ZP) analysis
- vi. Entrapment efficiency (EE)
- vii. Scanning electron microscopy (SEM)
- viii. *In vitro* release
- ix. Fourier transform infrared spectroscopy (FT-IR)
- x. Powder X-ray diffraction (PXRD)
- xi. Collection of mucoid *P. aeruginosa*, characterization and culture growth,
- xii. Minimum biofilm inhibitory concentration (MBIC)
- xiii. Minimum inhibitory concentration (MIC)
- xiv. Biofilm formation on coverslip and microscopy
- xv. Minimum biofilm eradication concentration (MBEC)
- xvi. MTT assay
- xvii. Haemolysis study
- xviii. Platelet aggregation
- xix. In vivo toxicity study
- xx. Statistical analysis