Improvement of drug safety by lipid based nanocarriers

**Improve drug physicochemical properties**
- **Solubility**
  - ↑ drug solubility;
  - ↓ drug precipitation;
  - ↓ excipient related toxicity
- **Stability**
  - ↑ stability against oxidative/hydrolytic degradation *in vitro*;
  - ↑ shelf life with freeze drying
- Provides right conformation to polypeptide drugs;
  - ↑ bioactivity
  - ↓ drug toxicity

**Provide targeting to site of action**
- Passive targeting;
  - ↑ drug accumulation in target site due to nanosize;
  - ↑ therapeutic activity;
  - ↓ therapeutic dose;
  - ↓ dosing frequency;
  - ↓ drug toxicity
- Active targeting;
  - ↑ Cellular uptake;
  - ↓ multidrug resistance;
  - ↑ therapeutic activity;
  - ↓ therapeutic dose;
  - ↓ dosing frequency;
  - ↓ drug toxicity

**Alter drug pharmacokinetic profile**
- Provides stability to peptides
  - ↓ enzymatic degradation;
  - ↑ residence time in blood
- Prevents opsonization through steric stabilization;
  - ↓ drug clearance;
  - ↑ residence time in blood
- Provides sustained drug release for non-targeted systems;
  - ↓ dosing frequency;
  - ↓ drug concentration fluctuation
- Drug retained in carrier for targeted systems;
  - ↓ albumin binding;
  - ↓ hemotological toxicity
  - ↓ non-specific distribution/interaction with other body parts