Application of preformulation considerations

- Objectives of the Preformulation Considerations are-
  - To provide and understand The degradation process,
  - Any adverse conditions relevant to the drug,
  - Bioavailability,
  - Pharmacokinetics and formulation of similar compound and
  - Toxicity

Continue....

- **Usefulness of Preformulation Consideration-**
  A. Selection of the drug candidate itself,
  B. Selection of formulation components,
  C. API& drug product manufacturing processes,
  D. Determination of the most appropriate container closure system,
  E. Development of analytical methods,
  F. Assignment of api retest periods
  G. The synthetic route of the api,
  H. Toxicological strategy.

solid dosage forms development

- Solid dosage form acquires most of the pharmaceutical market.
- The typical parameter studies for solid dosage forms relate to the ability of a powder mix to flow well in manufacturing machines and to the intrinsic characteristics that make it compressible.
- Pre-formulation influences on selection of the drug candidate itself
- Selection of formulation components, API & drug product manufacturing processes.
- Determination of the most appropriate container closure system, development of analytical methods, assignment of API retest periods, the synthetic route of the API and toxicological strategy.

Continue....

- The most important function of pre-formulation stage is solid state characterization which determines the next step in the formulation work of the studied API.
- Solubility studies identify those drugs with a potential for bioavailability problems.
  - E.g. Drug having limited solubility (7 %) in the fluids of GIT often exhibit poor or erratic absorption unless dosage forms are tailored for the drug.
- Physical properties of the studied API influence on its physical and chemical stability.
- A drug for oral administrative should be examined for solubility in an isotonic saline solution and acidic pH. This solubility data may provide the dissolution profile in vivo.

Continue . . . .

- It influences on the rout of administration, delivery system and the drug activity.
- Moreover, Chemical stability of the drug is affected by the physical properties.
- Crystal morphology, polymorphism, amorphous forms and hygroscopicity are usually studied.
- In addition, solubility, salt form, melting point, dissolution of the API are also studied.

Liquid dosage form development

- After solid dosage form second largest market is of liquid dosage form.
- Liquid dosage form has certain advantages like easy administration, fast absorption and variety of dosage form like syrup, emulsion, suspension etc.
- During development of liquid dosage form formulation of type of dosage form is based on preformulation studies, if drug is aqueous soluble then it can be easily formulated in solution dosage form, if drug is insoluble then it can be formulated in suspension form, oily drug can be formulated in emulsion form.

Continue . . . .

- Solubility in various mediums is useful in developing suspension or solution toxicological and pharmacological studies.
- Characterization of drug in solid form for particle size and surface area during formulation of liquid dosage form is also important as it affect various parameters of liquid dosage form.
- Stability concern is more in liquid dosage form as compared to solid dosage form, as liquid provides media for various degradation processes hence special concern should be provided over stability in case of liquid dosage form.
- Selection of container closure system is also important criteria during preformulation of liquid dosage form.

Continue . . . .

- Some of the examples studied during liquid preformulation studied include organoleptic characters like taste, colour, viscosity and flow ability studies, stability studies, solubility of API, selection of vehicle and proper excipients like preservatives, antioxidants etc.

Parenteral dosage form development

- Parenteral word means outside of intestine.
- The drugs which are injected into the body come under parenteral.
- Preformulation studies of parenteral dosage forms include bulk characterization like particle size, powder flow properties, crystallinity and polymorphism, solubility study including pka determination, partition coefficient, stability study, spectroscopic studies, microscopic studies, chromatographic studies.
- Selection of container closure system is also important criteria during preformulation studied of parenteral dosage form.