'Targeted drug delivery system is a special form of drug delivery system where the medicament is selectively targeted or delivered only to its site of action or absorption and not to the non-target organs or tissues or cells.'

• It is a method of delivering medication to a patient in a manner that increases the concentration of the medication in some parts of the body relative to others.

• Targeted drug delivery seeks to concentrate the medication in the tissues of interest while reducing the relative concentration of the medication in the remaining tissues.

• This improves efficacy and reduce side effects.

THE DRUG MAY BE DELIVERED :

• To the capillary bed of the active sites.

• To the specific type of cell (or) even an intracellular region. Ex: Tumour cells but not to normal cells.

• To a specific organ (or) tissues by complexion with the carrier that recognizes the target.

OBJECTIVE :

• To achieve a desired pharmacological response at a selected sites without undesirable interaction at other sites, there by the drug have a specific action with minimum side effects & better therapeutic index.

• Ex- In cancer chemotherapy and enzyme replacement therapy.

What is Drug Targeting?

➤ The therapeutic response of a drug depends upon the interaction of drug molecules with cell on cell membrane related biological events at receptor sites in concentration dependent manner.

➤ Selective and effective localization of the pharmacologically-active moiety at preidentified target(s) in therapeutic concentration, while restricting its access to non-target(s) normal cellular linings, thus minimizing toxic effects and maximizing the therapeutic index.

Target cell

Normal Cell

Normal Cell
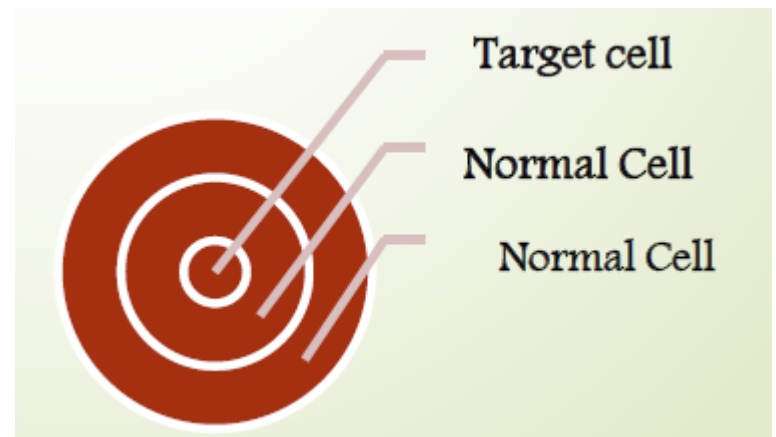
Reason for drug targeting:

- In the treatment or prevention or diseases.
- Pharmaceutical drug instability in conventional dosage form solubility ,biopharmaceutical low absorption, high-membrane bounding, biological instability, pharmacokinetic / pharmacodynamic short half life, large volume of distribution, low specificity, clinical, low therapeutic index.

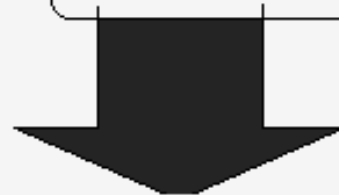# Properties of İdeal Drug Delivery Targeting

• It should be -
> o Non-toxic
> o Biocompatible
> o Biodegradable
> o Physicochemical stable both in-vivo & in-vitro

• Controlled and predictable drug release

• Minimal drug leakage

• Carrier should be readily eliminated without causing any change in
diseased state

• Preparation should be easy, reproductive and cost effective

• Drug release should not effect drug action

ADVANTAGES :

• Drug administration protocols may be simplified.

• Toxicity is reduced by delivering a drug to its target site, there by reducing harmful systemic effects.

• Drug can be administered in a smaller dose to produce the desire effect.

• Avoidance of hepatic first pass metabolism.

• Enhancement of the absorption of target molecules such as peptides and particulates.

• Dose is less compared to conventional drug delivery system.

• No peak and valley plasma concentration.

• Selective targeting to infections cells that compare to normal cells.

DISADVANTAGES :

• Rapid clearance of targeted systems.

• Immune reactions against intravenous administered carrier systems.

• Insufficient localization of targeted systems into tumour cells.

• Diffusion and redistribution of released drugs.

• Requires highly sophisticated technology for the formulation.

• Requires skill for manufacturing storage, administration.

• Drug deposition at the target site may produce toxicity symptoms.

•Difficult to maintain stability of dosage form.

E.g.: Resealed erythrocytes have to be stored at 4^0 C.

• Drug loading is usually law. E.g. As in micelles. Therefore it is difficult to predict /fix the dosage regimen.

Briefly;

ADVANTAGES

• Reduction of drug side-effects

• Reduced frequency of drug intake

• Reduced dose of drug

• Uniform blood level of drug

• Maximizes the therapeutic index

DISADVANTAGES

• Rapid clearance of targeted systems

• Immune reaction against carrier systems

• Insufficient localization of targeted systems in tumor cells

• Diffusion and redistribution of released drug

• High cost