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## Targeted Drug delivery systems

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### Short Communication

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### INTRODUCTION

Drug delivery system is a device that empowers the introduction of a therapeutic substance in the body and enhances the efficacy and safety by controlling the rate, time, and place of release of drug in the body. This methodology includes organization of the therapeutic product, the release of the active ingredients by the product, and the resulting transport of the active ingredients over the biological membrane [1-3].

#### Types of conventional drug delivery

Conventional drug delivery system includes the formulation of the drug into a suitable form [4-7]

- **Solid dosage forms:** Tablets, capsules, powders
- **Liquid dosage forms:** **Mono phasic:** Syrups, Elixirs  
**Biphasic:** Suspensions, Emulsions
- **Powders**

#### Advantages:

Convenience in Administration, Non invasive, accurate dose, Higher compliance, Economical [8-10].

#### Disadvantages:

Unconscious patients cannot take dose, Low solubility and permeability, Degradation by Gastro Intestinal flora, first pass metabolism, Food interactions, and Poor bioavailability.

### DISCUSSION

High concentration of conventional drugs is required for desired therapeutic effect this leads to toxicity. Disadvantages with conventional Drugs can be overcome by using targeted drug delivery systems. Delivery of drug to specific part of body. [11 - 15]

#### **Therapeutic benefits of targeted Drug Delivery systems:**

Increased efficacy of drug, Site specific delivery, low toxic effects, treatment for previously incurable diseases, better patient compliance, Deliver the drug at the right point, in the right time and with right dosage. [16-27]

#### **Types of targeted Drug delivery systems:**

##### ***Liposome's:***

Liposome's are spherical vesicles in which lipid layer enclosed in aqueous environment. Anthracyclines

##### ***Microspheres/Microparticles:***

Solid small spherical particles 1  $\mu\text{m}$  to 1000  $\mu\text{m}$  contains a microscopic hollow sphere

##### ***Nanoparticles:***

Particle size ranges from  $10^{-9}\text{m}$  .Microscopic particle size is measured in nano meters. small object that behaves as a whole unit with respect to its transport and properties.

##### ***Nanocrystal:***

smaller than 100 nanometres. Composed of atoms in either a single- or poly-crystalline arrangement.

##### ***Nanowires:***

Wire with a diameter of only a few nanometres. structures that have a thickness or diameter constrained to tens of nanometers or less and an unconstrained length

##### ***Nanotubes:***

Tubular molecule consists of a large number of carbon atoms.

##### ***Micro emulsion:***

clear, thermodynamically stable, isotropic liquid mixtures of oil, water and surfactant. Aqueous phase contain salt /other ingredients oil phase contain complex mixture of different hydrocarbons and olefins.

##### ***Nanosized ethosomes:***

Phospho lipid elastic nanovesicles. contains ethanol 20–45%. Deliver the drug to outer layer of skin.

**Nano cubes:**

Exhibit high current densities due to the presence of 100 crystallographic planes

**Transdermal:**

Self drug containing dosage form which when applied to skin deliver the drug to skin at controlled rate for longer period of time.

**Nano emulgel:**

When gel and emulsion are used in combination with nano sized it is known as emulgel

**Nano rods:**

Dimensions range from 1–100 nm. Nano rods synthesized from metals or semiconducting materials.

**Carbon nano tube:**

Tubular cylinders of carbon atoms, contains mechanical, electrical, thermal, optical and chemical properties at the individual tube level [56-60].

**Applications:**

Targeted drug delivery used to treat cardiovascular diseases, Cancer tumors and diabetes, used for treatment of tuberculosis, CNS, Oncology, Cardiovascular, pulmonary and infectious disease [28 - 55].

## CONCLUSION

To overcome the limitations of conventional drug delivery system, continuous steady rate of drug at the site of action targeted Drug Delivery systems was developed it requires very small amount of drug comparatively to conventional dosage forms. Due to this, the toxicity inside the body and side effects of the drug on organs are reduced. Drugs can be delivered to the exact location with the right amount of dosage. Research studies are still going on targeted drug delivery system

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