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Editorial

A Brief Note on Various Drug Delivery Systems

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DESCRIPTION

Drug delivery systems are technologies that are designed to provide therapeutic drugs in a targeted and/or controlled manner. Drugs have long been used to enhance health and prolong people's lives. The rate at which a drug is delivered and the region inside the body where it is distributed are controlled by delivery systems.

Drug Delivery Systems (DDSs) are designed to deliver the appropriate amount of medication to the appropriate target areas while also maintaining the optimal drug levels. Liposomes, nanoparticles, niosomes, transdermal drug delivery, implants, microencapsulation, and polymers are being studied as novel DDS.

A drug's efficacy can be altered greatly by the mode through which it is given. It is now easy to manage medication pharmacokinetics, pharmacodynamics, toxicity, immunogenicity, and effectiveness by designing a range of Drug Delivery Systems (DDSs).

It is possible to "optimise" the performance of a medicine within the body by determining the best-suited delivery mechanism for a certain drug molecule.

This method is used by binding molecules to release medications at a regulated rate at a specific location in the body. The idea of drug distribution is closely linked to drug dose and administration route. There are various routes of drug delivery systems are Buccal, Oral, Pulmonary, Transdermal, Ocular, nasal, sublingual, vaginal.

Buccal medication delivery refers to the administration of a medicament through the buccal mucosa (lining of the cheek). While this route of delivery avoids first-pass effects (rapid drug uptake and metabolism into inactive compounds by the liver), it presents a "challenging" barrier to drug absorption, particularly for larger biopharmaceuticals–delivery is currently limited to small molecule drugs with lipophilic properties because they can easily cross the membrane. Since the buccal route is frequently utilised for extended-release drug administration (in which the medication is given in a regulated manner over a prolonged period of time), formulations that may bind to the mucosa are generally selected. For buccal administration, a number of formulations have been developed, including pills, gels, lozenges, and patches.

Nasal drug delivery is the administration of a medicine through the nasal cavity of the nose. Nasal spray drugs are often used to treat local disorders of the upper respiratory tract (e.g. nasal congestion, allergic rhinitis). However, in some cases this delivery method can be used for systemic distribution of small molecule medications, such as the migraine treatment. Because the thin nasal mucosa is highly vascularized, transport to the systemic blood circulation is quick, and first-pass metabolism can be avoided, as with buccal administration. Nasal drug delivery can be achieved by using liquid or (less commonly) powder formulations.

Due to the eye's unique structure and physiology - static, dynamic, and metabolic ocular barriers inhibit medication absorption through the eye. There are various potential methods for delivering medications to particular areas of the eye.

Because of its non-invasive nature, convenience of use, cost-effectiveness, and the highly absorptive qualities of the Gastrointestinal (GI) tract, oral drug delivery is most well-known and often selected method of drug administration. To ensure the efficacy of oral medication administration, the aqueous solubility of the therapeutic molecule in the GI system should be evaluated to identify if adjustments are necessary to increase bioavailability. However, there are disadvantages to oral medication administration when it comes to its applicability for particular patient populations, such as paediatric, geriatric, and those with cognitive impairment.

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