Innovative methods to increase the oral bioavailability of medications that aren't very soluble.

Jayesh Munira*

Department of Pharmaceutics, SVKM's Dr. Bhanuben Nanavati College of Pharmacy, Mumbai, India

Received date: *January 21, 2023, Manuscript No. AJPTI-23-92527;* ***Editor assigned date:*** *January 26, 2023, Pre QC No. AJPTI-23-92527(PQ);* ***Reviewed date:*** *February 16, 2023, QC No. AJPTI-23-92527;* ***Revised date:*** *February 23, 2023, Manuscript No. AJPTI-23-92527(R);* ***Published date:*** *February 28, 2023.*

Accepted on 25th February, 2023

Description

Implantable Drug Delivery Systems (DDS) are medical devices that are implanted in the body to deliver drugs over an extended period. These devices have gained significant attention in recent years as they offer several advantages over traditional drug delivery methods, such as oral or intravenous administration. Implantable DDS can deliver drugs directly to the target site, bypassing the first-pass metabolism, and reduce the frequency of dosing. Implantable drug delivery systems can be broadly classified into two categories based on their mechanism of drug release: passive and active.

Passive implantable drug delivery systems: Passive implantable drug delivery systems release drugs at a constant rate without any external stimulus. These systems are designed to maintain a steady-state drug concentration in the body. The most common types of passive implantable drug delivery systems are polymer based drug delivery systems are the most commonly used implantable drug delivery systems. These systems consist of a drug-loaded polymer matrix that slowly releases the drug over an extended period. The rate of drug release can be controlled by altering the polymer composition or the drug loading.

Reservoir-based drug delivery systems consist of a drug reservoir and a semipermeable membrane that controls the release of the drug. The rate of drug release can be controlled by altering the membrane's permeability or by changing the size of the drug reservoir.

Active implantable drug delivery systems release drugs in response to an external stimulus, such as light, temperature, or electrical signals. These systems are designed to provide ondemand drug release and can be controlled remotely. The most common types of active implantable drug delivery systems are electro-responsive drug delivery systems use electrical signals to trigger drug release. These systems consist of a drug-loaded polymer matrix and a conducting material that responds to electrical signals. When an electrical signal is applied, the Conducting material contracts, squeezing the polymer matrix and releasing the drug.

Thermo-responsive drug delivery systems release drugs in response to changes in temperature. These systems consist of a drug-loaded polymer matrix and a temperature-responsive polymer. When the temperature is increased above a certain threshold, the temperature-responsive polymer collapses, releasing the drug.

Implantable drug delivery systems have several applications in the treatment of various diseases, such as cancer, chronic pain, and diabetes.

Implantable drug delivery systems can be used to deliver chemotherapeutic drugs directly to the tumor site, bypassing the systemic circulation. This can reduce the side effects of chemotherapy and improve the efficacy of the treatment. For example, Gliadel wafers are implantable polymer-based drug delivery systems that release carmustine directly to the brain tumor site after surgery.

Implantable drug delivery systems can be used to deliver opioids or local anesthetics directly to the site of pain. This can provide effective pain relief without the side effects associated with oral administration. For example, the Medtronic Synchro Med II pump is an implantable drug delivery system that delivers opioids directly to the spinal cord to manage chronic pain.

Implantable drug delivery systems can be used to deliver insulin directly to the bloodstream, bypassing the need for frequent injections. This can improve patient compliance and reduce the risk of hypoglycemia. For example, the Medtronic MiniMed 670G system is an implantable insulin pump that uses a glucose sensor to deliver insulin as needed.

*Correspondence to

Jayesh Munira,

Department of Pharmaceutics, SVKM's Dr. Bhanuben Nanavati College of Pharmacy,

Mumbai,

India,

E-mail: jayeshmuni10.1988@gmail.com

Citation*: Munira J. Innovative Methods to Increase the Oral Bioavailability of Medications that Aren't Very Soluble AJPTI 2023;11(40):1-2.*