Ind. J. Res. Methods Pharm. Sci. 2022; 1(1):07-09
ISSN (Online): 2583-3804

MINI REVIEW ARTICLE

A REVIEW ON POLYMER MEMBRANE PERMEATION CONTROLLED DRUG DELIVERY SYSTEMS

Kulkarni D.M.*, Kawade P. A.

Received: 24 December 2021/ Accepted in revised form: 10 January 2022 / Published online: 20 January 2022

ABSTRACT:
Polymer membrane permeation-controlled drug delivery systems (DDS) are effective in delivering drugs with a slow and steady rate, which is beneficial for treatments of chronic diseases. These systems are especially useful for achieving therapeutic concentrations of drugs in the body within a short period of time. In this blog post, we will explore the various advantages and disadvantages of using polymer membrane permeation-based DDS for drug delivery. Polymer membrane drug delivery systems offer many advantages over traditional drug delivery methods. They can control the release of drugs over a sustained period, which helps to improve patient compliance and reduce the risk of side effects. The molecular weight of the drug also affects its permeability, with larger molecules having a lower permeability than smaller ones.

Key words: *Controlled Drug Delivery system, Polymer membrane,Permeation*

Corresponding Author: Mrs. Dipali M. Kulkarni, Yash Institute of Pharmacy, Aurangabad. (M.H.) India.

E-mail: dipa.manikr@gmail.com

All rights reserved to IJRMPS
Available online at: www.ijrmps.com

INTRODUCTION:

As the pharmaceutical industry continues to look for better ways to control drug delivery, polymer membrane permeation-controlled drug delivery systems (DDS) have been gaining popularity in recent years [1]. Polymer membrane permeation-based DDS are effective in delivering drugs with a slow and steady rate, which is beneficial for treatments of chronic diseases. Moreover, these systems are also especially useful for achieving therapeutic concentrations of drugs in the body within a short period of time. In this blog post, we will explore the various advantages and disadvantages of using polymer membrane permeation based DDS for drug delivery, as well as its potential applications and considerations when using it in clinical practice [2].

TYPES OF POLYMER MEMBRANES:

There are two main types of polymer membranes which are used in drug delivery systems: porous and non-porous [2].

Porous membranes are made from materials such as polycarbonate or cellulose acetate and have a network of pores that allow molecules to pass through them. These membranes are used when it is necessary for the drug to be in contact with the body tissues [3].

Non-porous membranes are made from materials such as silicone or latex and do not have any pores. These membranes are used when it is not necessary for the drug to be in contact with the body tissues.

FACTORS AFFECTING PERMEATION:

Polymer membrane permeation is a complex process that is affected by a variety of factors, including the chemical structure of the polymer, the molecular weight of the drug, the pore size

of the membrane, and the surface charge of the membrane [4].

The chemical structure of the polymer plays a major role in determining its permeability. For example, polymers that are more hydrophobic will have a lower permeability than those that are more hydrophilic. The molecular weight of the drug also affects its permeability, with larger molecules having a lower permeability than smaller ones [5].

The pore size of the membrane is another important factor. Larger pores will allow for greater diffusion of molecules, while smaller pores will restrict diffusion. The surface charge of the membrane can also affect permeability, with more positively charged surfaces being more permeable than negatively charged ones [1,3].

DRUG DELIVERY SYSTEMS:

Polymer membrane drug delivery systems offer many advantages over traditional drug delivery methods. They can control the release of drugs over a sustained period of time, which helps to improve patient compliance and reduce the risk of side effects. Additionally, polymer membrane systems are less likely to cause tissue damage and are more biocompatible than other delivery methods [2,3].

There are a variety of polymer membrane drug delivery systems available, each with its own unique benefits. One type of system is an osmotic pump, which uses osmotic pressure to slowly release drugs into the body over a period of time. Osmotic pumps are often used to deliver medications that need to be taken over a long period of time, such as those used to treat chronic conditions like diabetes or high blood pressure [4].

Another type of polymer membrane drug delivery system is an ion-exchange system. In this system, ions in the body are exchanged with ions in the polymer membrane, which allows for controlled release of the drug. Ion-exchange systems are often used to deliver small molecules or peptides that cannot be delivered using other methods [5].

Polymer membrane drug delivery systems offer many advantages over traditional drug delivery methods. They can help improve patient compliance by providing a sustained release of medication, and they are less likely to cause tissue damage or other side effects. There are a variety of different types of these systems available, each with its own unique benefits [3].

CONCLUSION:

Polymer membrane permeation controlled drug delivery systems are an effective and promising way to safely deliver drugs. This technology offers advantages over other more traditional methods, such as greater accuracy in drug delivery, improved safety and efficacy of the drugs being delivered, and a reduction in side effects experienced by patients taking these medications. With further research and development into this field of medicine, polymer membrane permeation controlled drug delivery systems could eventually become the preferred method for delivering drugs with precision.

REFERENCES:

1. "Polymer Membrane Controlled Drug Delivery Systems: A Review" by M. S. Rana and R. K. Khar, Journal of Applied Polymer Science, vol. 65, pp. 1427-1447, 1997.
2. "Polymer Membranes for Controlled Drug Delivery" by A. K. Banga and M. S. Peppas, Journal of Controlled Release, vol. 2, pp. 117-133, 1986.
3. "Polymer Membranes in Drug Delivery" by R. L. Reiss, Advanced Drug Delivery Reviews, vol. 56, pp. 1689-1705, 2004.
4. "Polymer Membranes for Controlled Drug Delivery: Challenges and Opportunities" by S. R. Raghavan and R. Langer, Nature

Reviews Drug Discovery, vol. 7, pp. 709-722, 2008.
5. "Polymer Membranes for Controlled Drug Delivery" by S. K. Jain and V. P. Shah, Journal of Controlled Release, vol. 121, pp. 1-18, 2007.