

SNS COLLEGE OF PHARMACY AND HEALTH SCIENCES



Affiliated To The Tamil Nadu Dr. MGR Medical University, Chennai

Approved by Pharmacy Council of India, New Delhi.

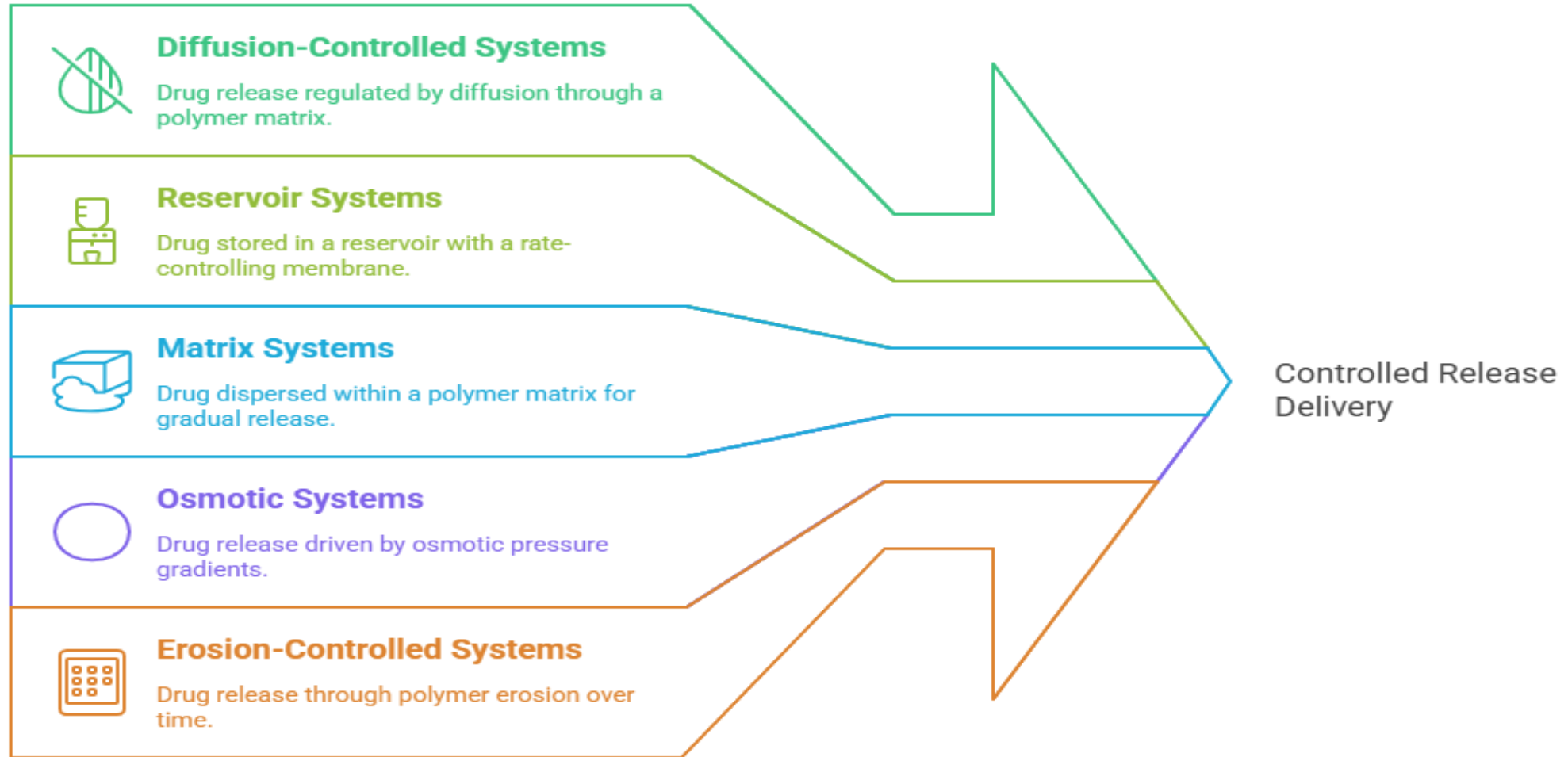
Coimbatore -641035

COURSE NAME : NOVEL DRUG DELIVERY SYSTEM (BP 706 T)

VII SEM / IV YEAR

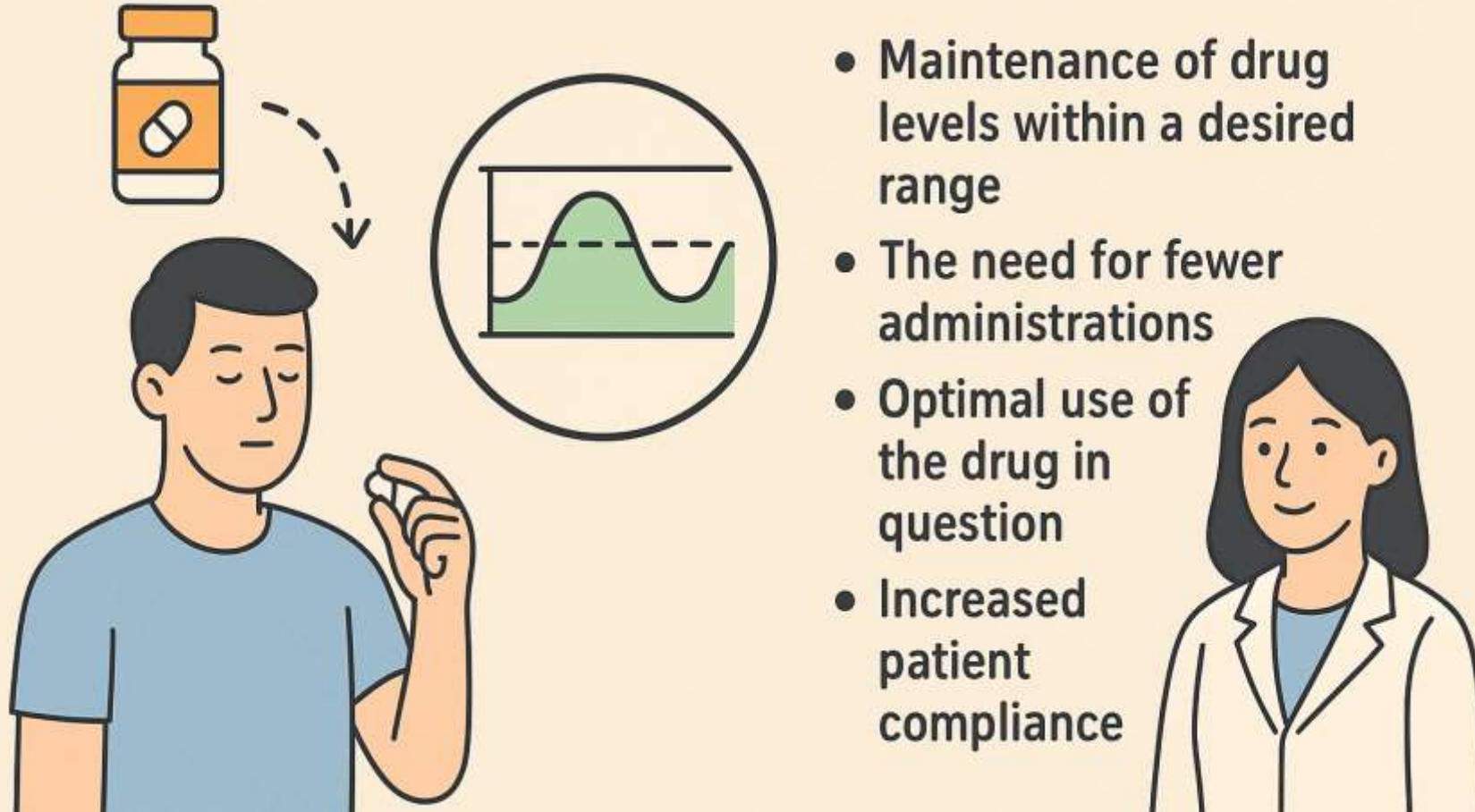
TOPIC 1 : CONTROLLED RELEASE DRUG DELIVERY SYSTEMS

Pathways to Controlled Release



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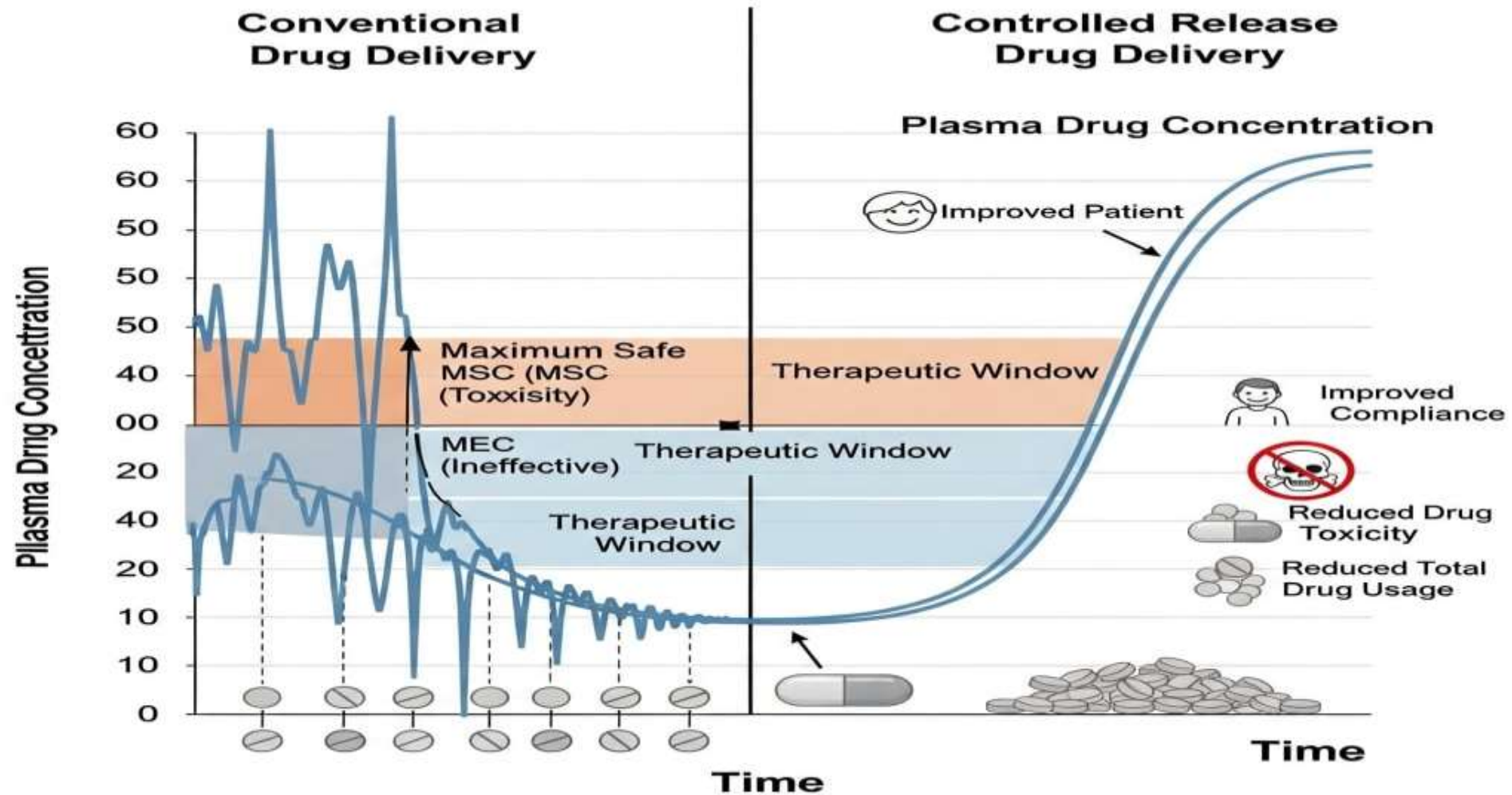
CONTROLLED DRUG DELIVERY SYSTEMS



The illustration depicts a controlled drug delivery system. On the left, a man in a blue t-shirt is shown taking a pill. Above him is a bottle of pills with a dashed arrow pointing to a circular inset. The inset contains a graph of drug concentration over time, with a green shaded area under the curve. To the right, a woman in a white lab coat is shown.

- Maintenance of drug levels within a desired range
- The need for fewer administrations
- Optimal use of the drug in question
- Increased patient compliance

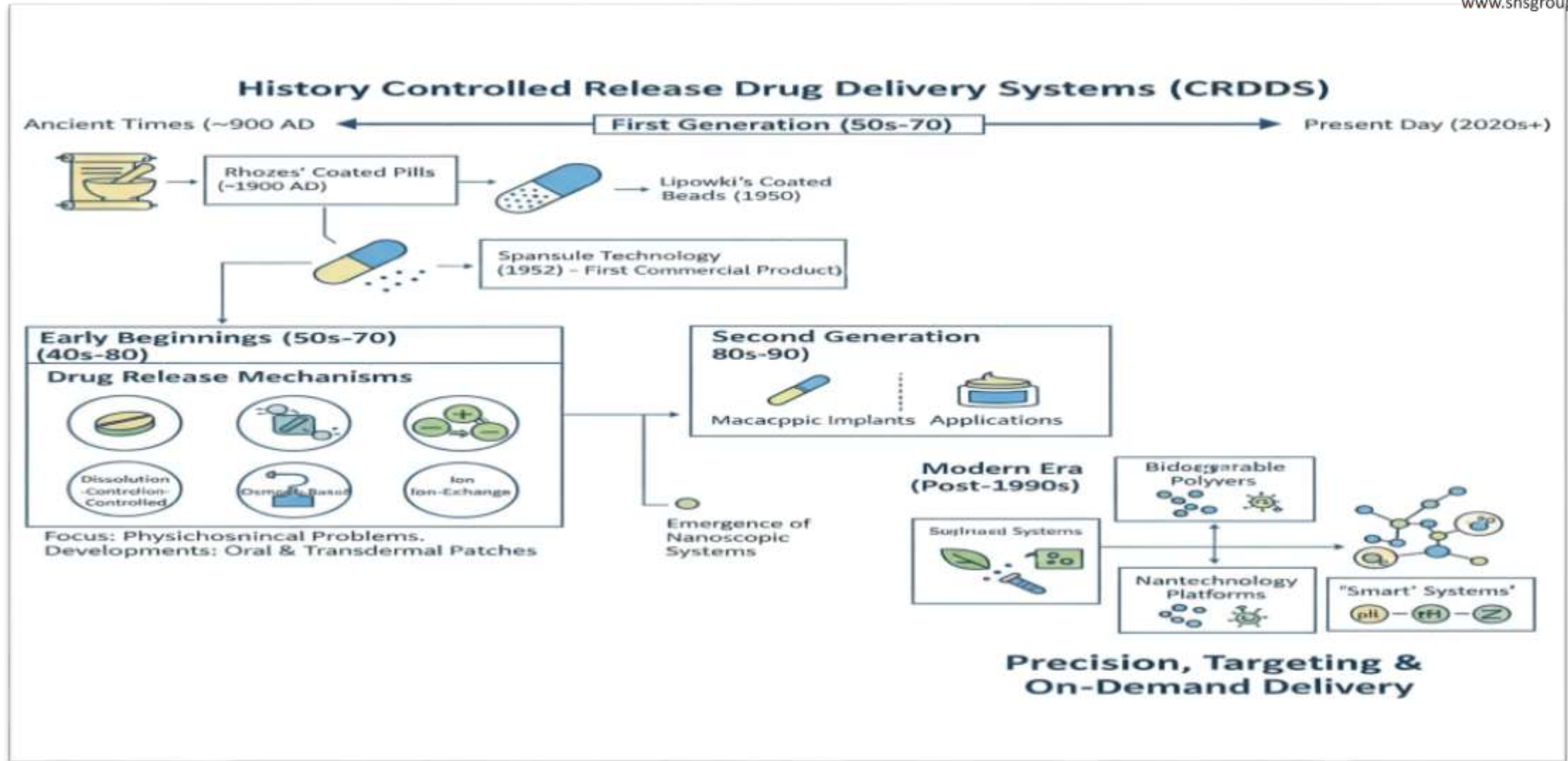
ADVANTAGES OF CRDDS



DRUGS SUITABLE FOR CRDDS



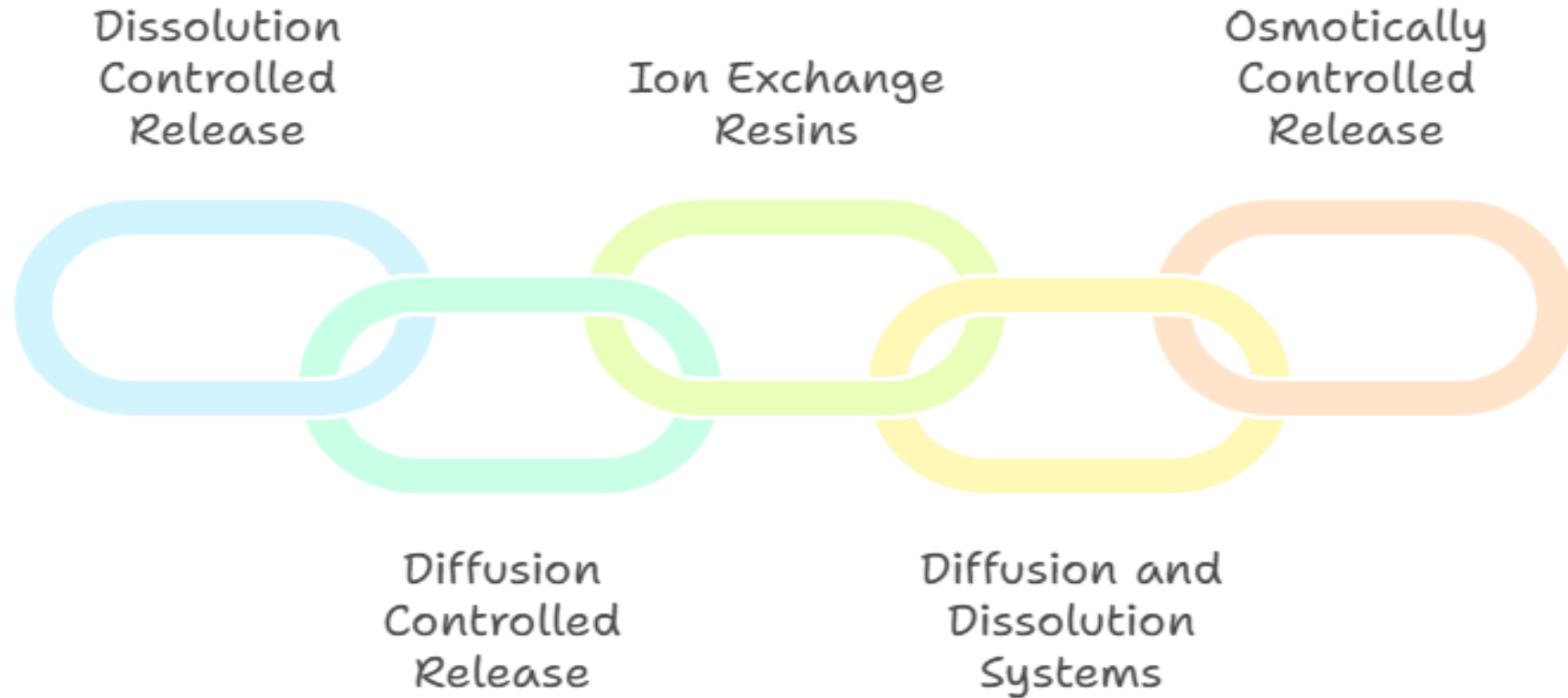
HISTORY OF CRDDS



CONTROLLED RELEASE DRUG DELIVERY SYSTEM



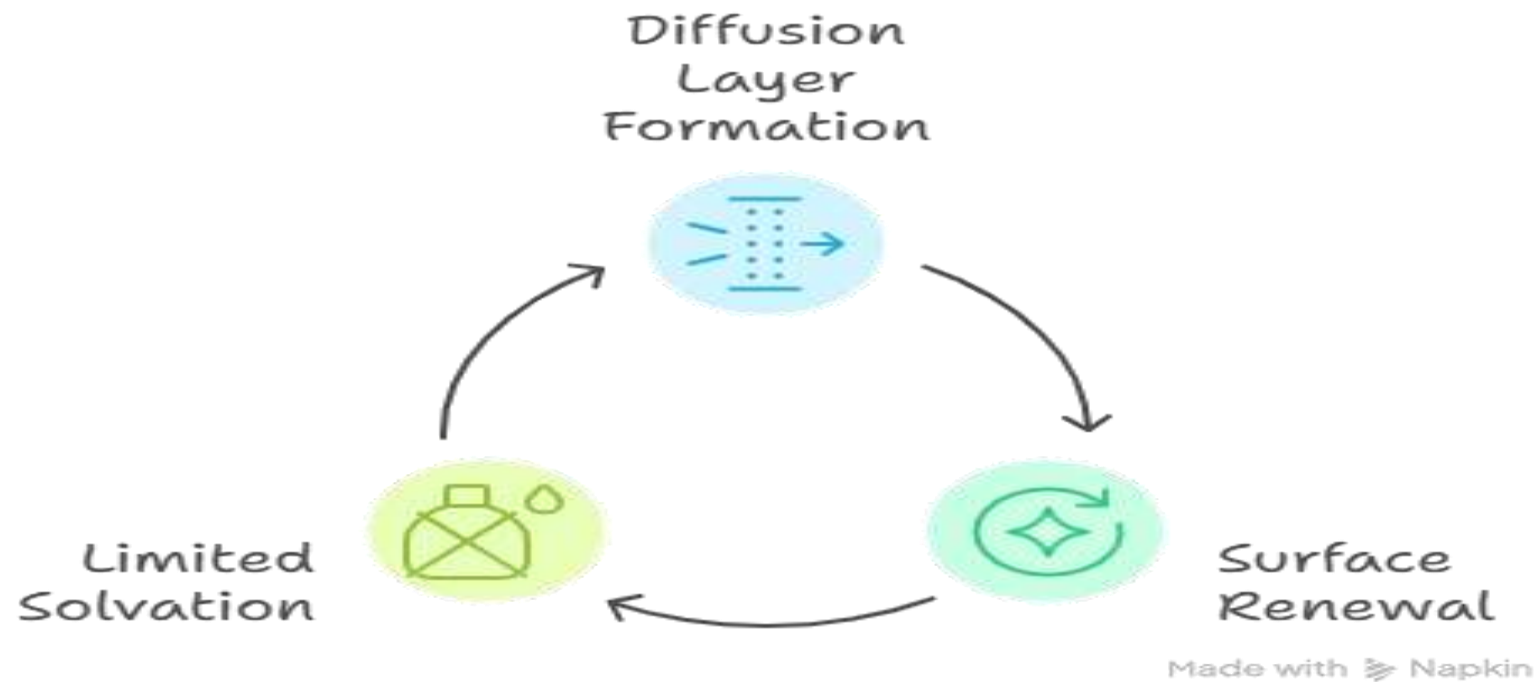
Methods of Controlled Release



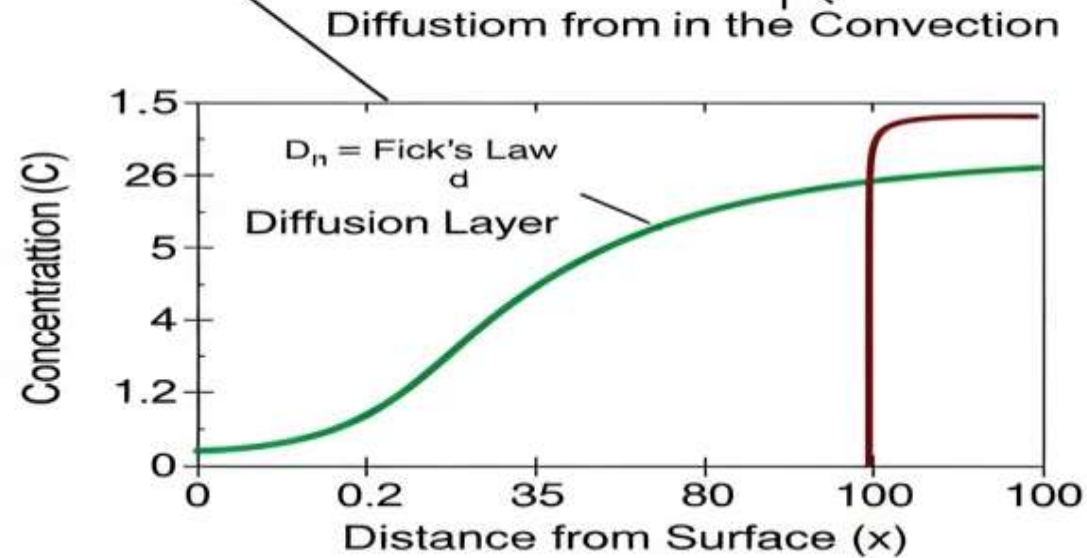
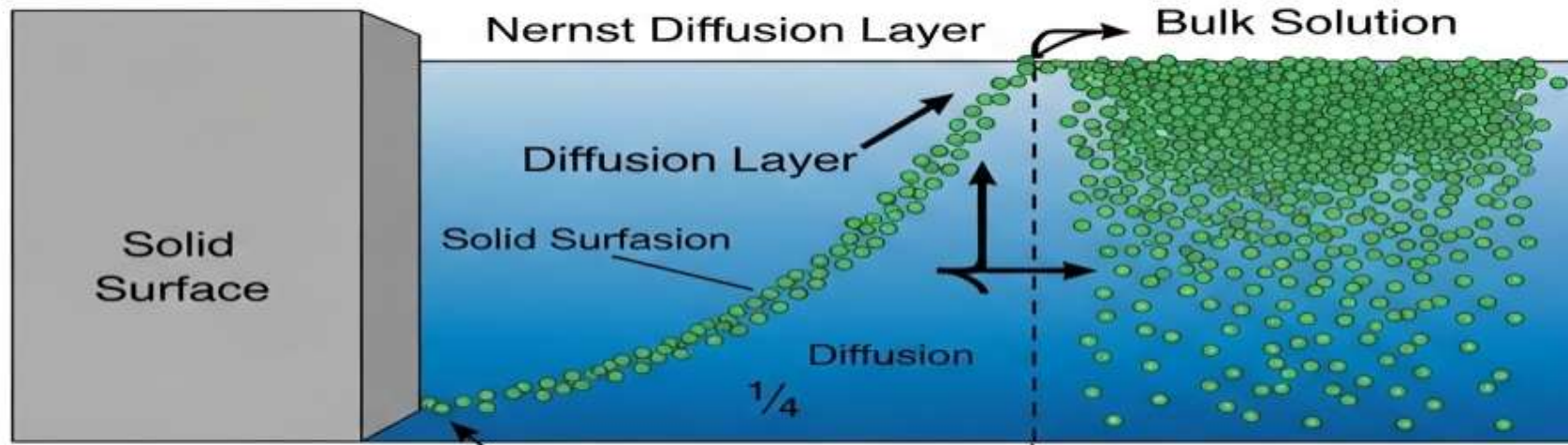
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DISSOLUTION CONTROLLED RELEASE

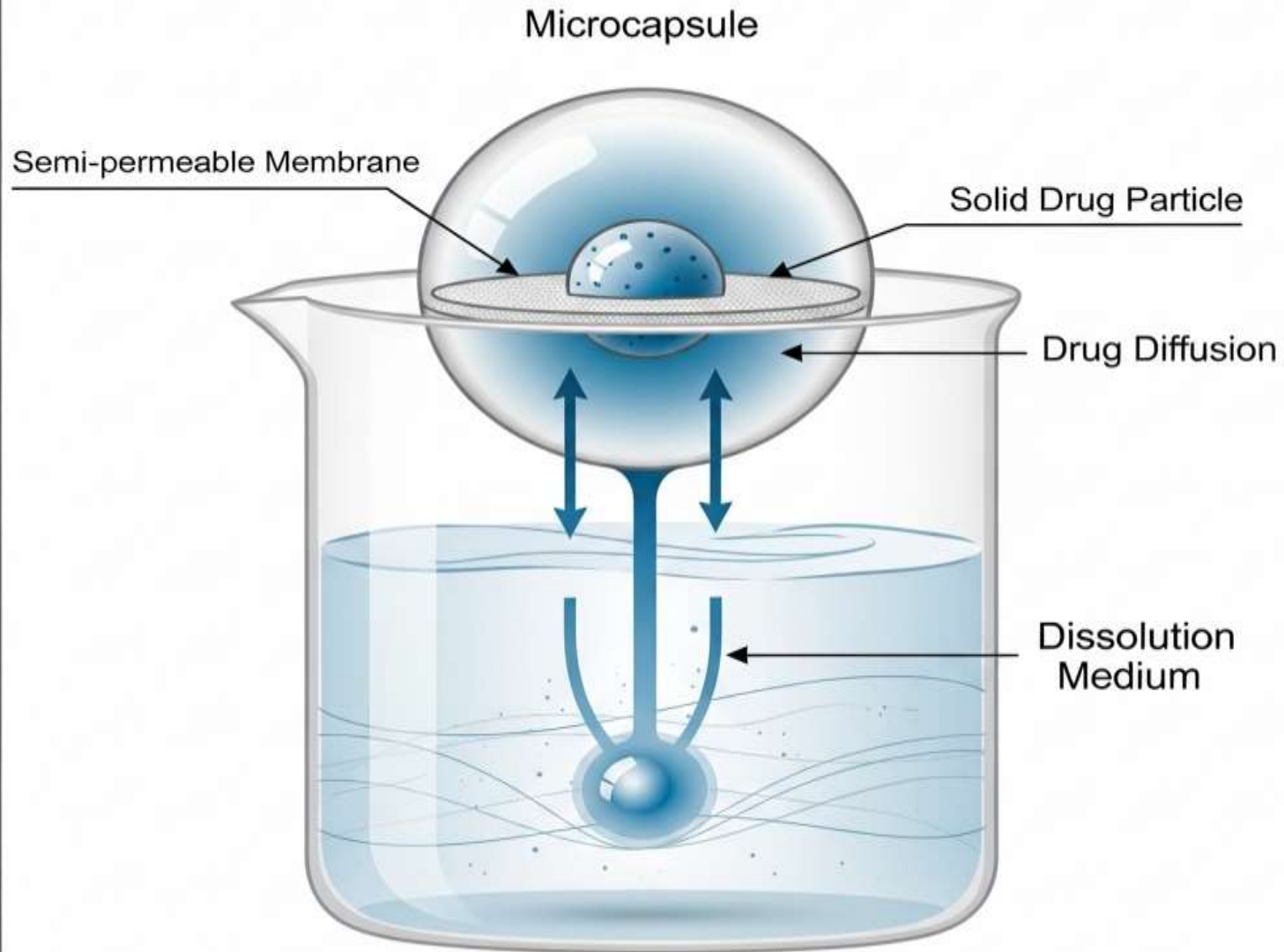
Theories of Dissolution



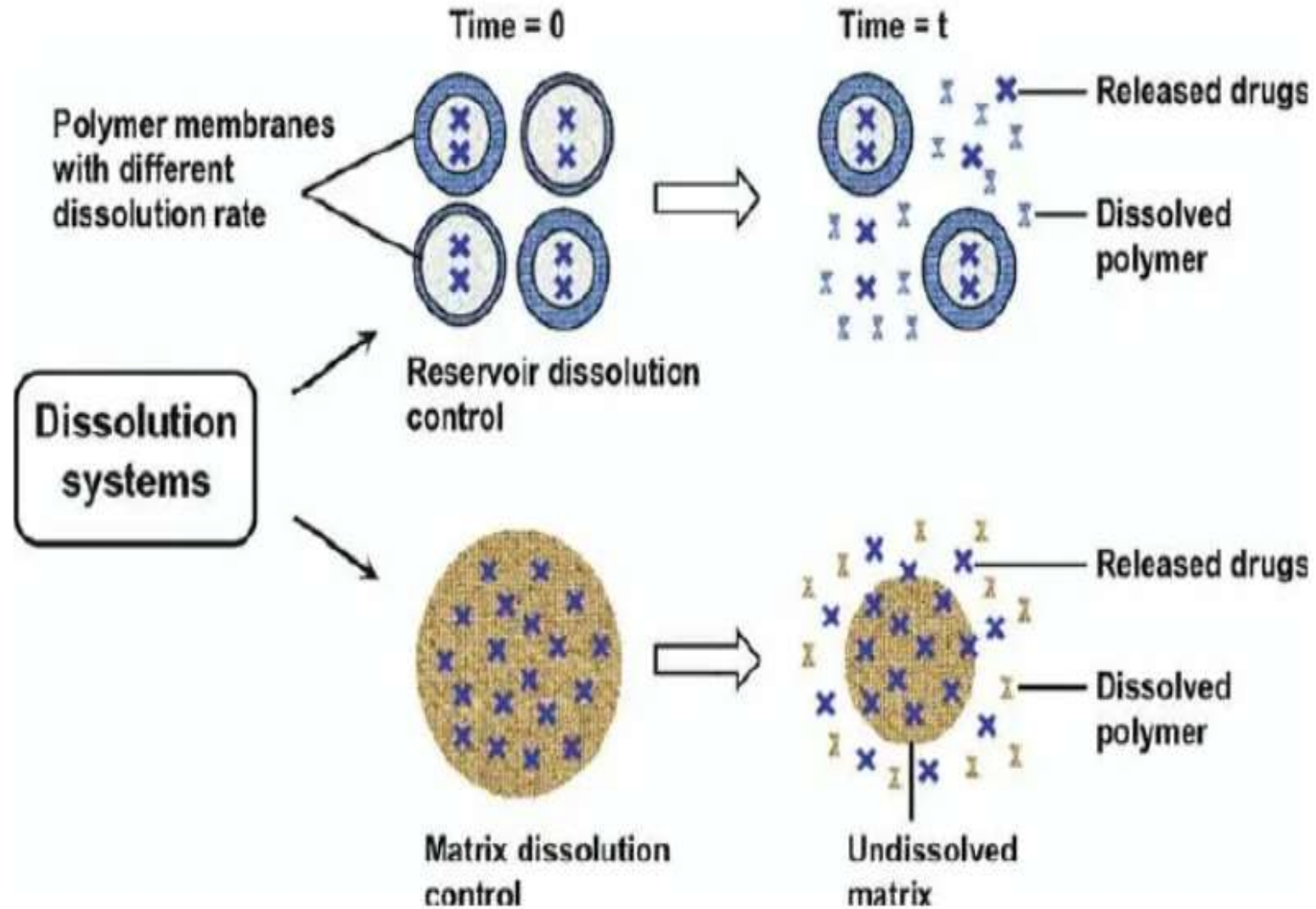
The Diffusion Layer Theory



ENCAPSULATED DISSOLUTION SYSTEM

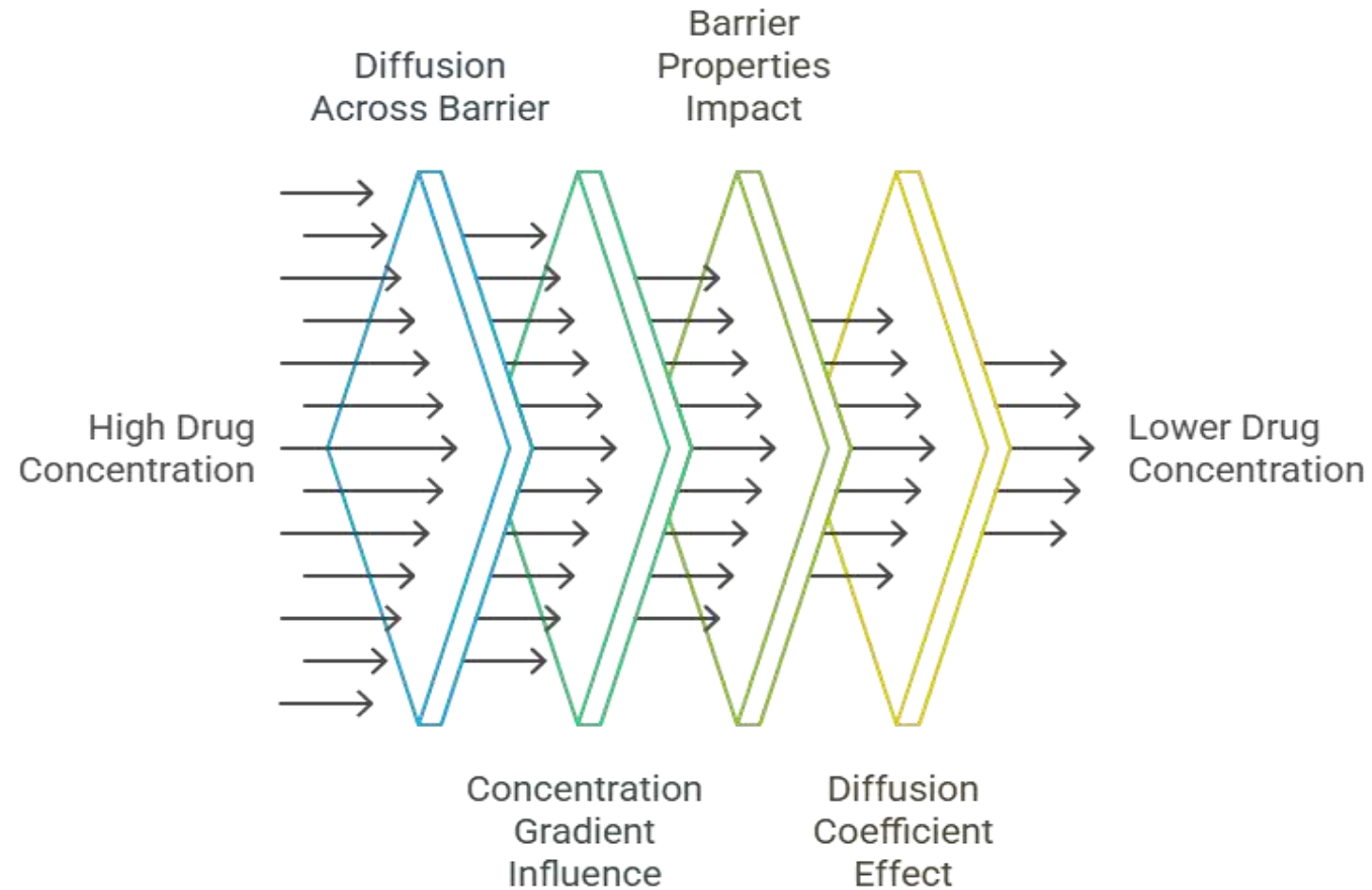


MATRIX DISSOLUTION-CONTROLLED SYSTEMS

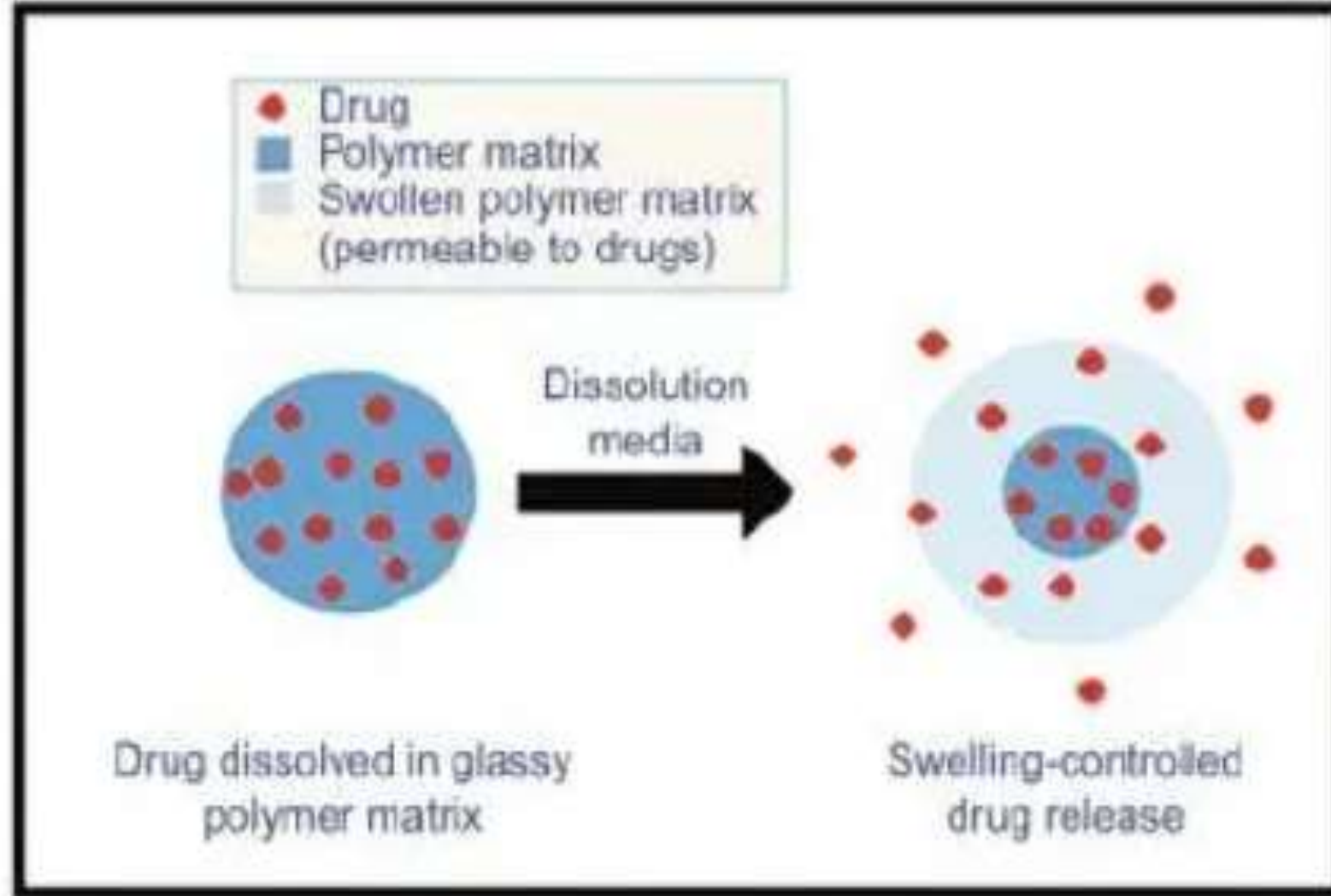


DIFFUSION-CONTROLLED SYSTEMS

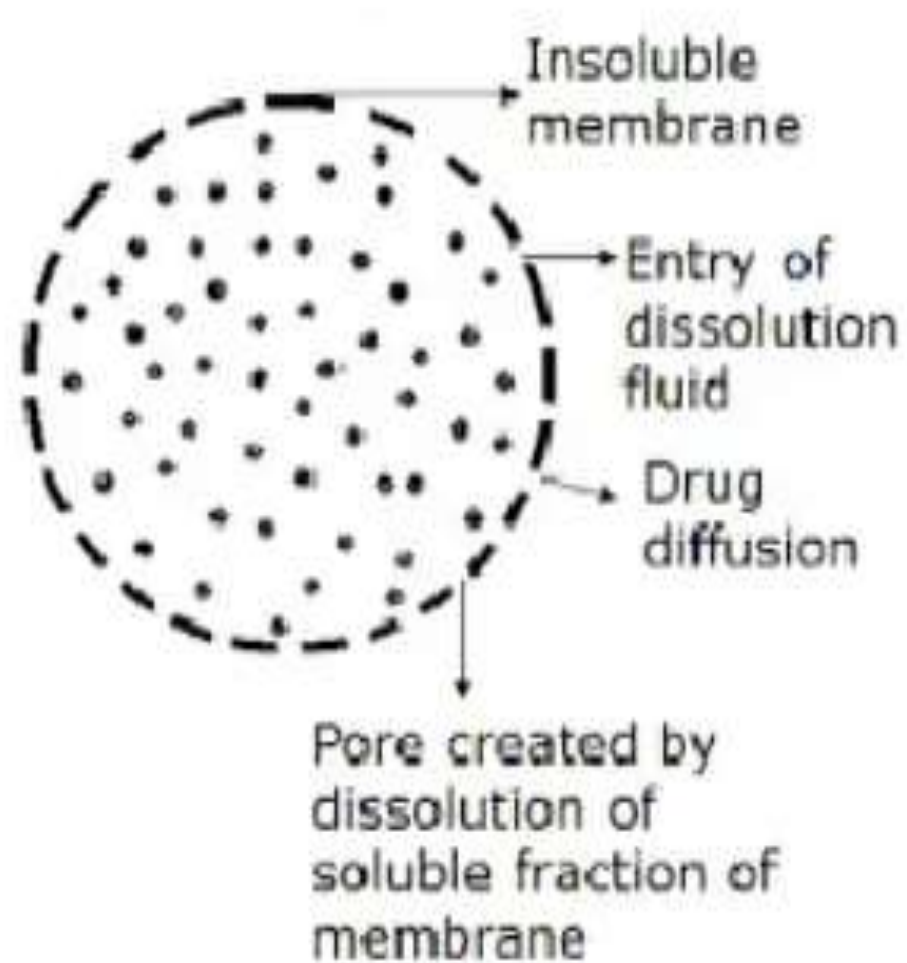
Drug Release Process



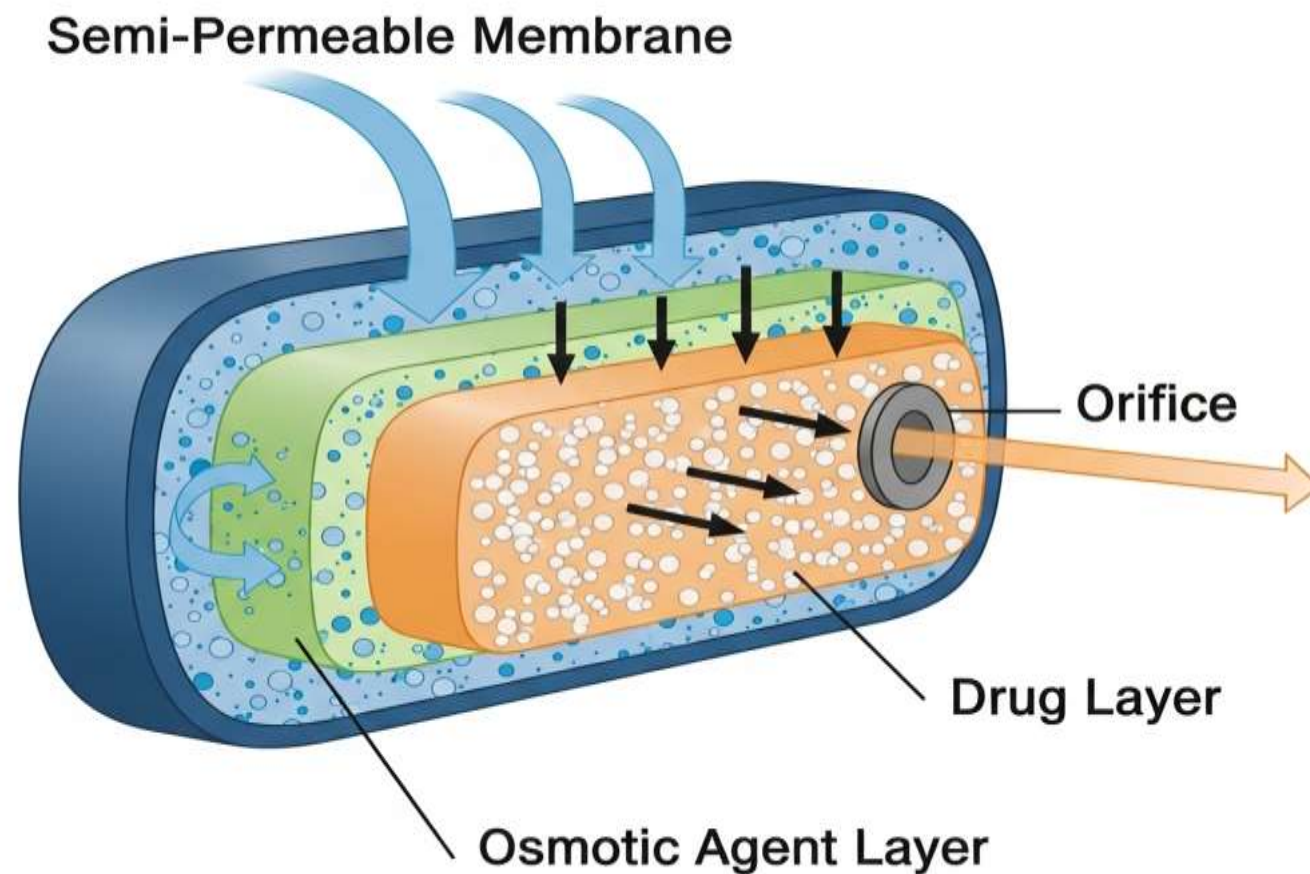
RESERVOIR SYSTEMS



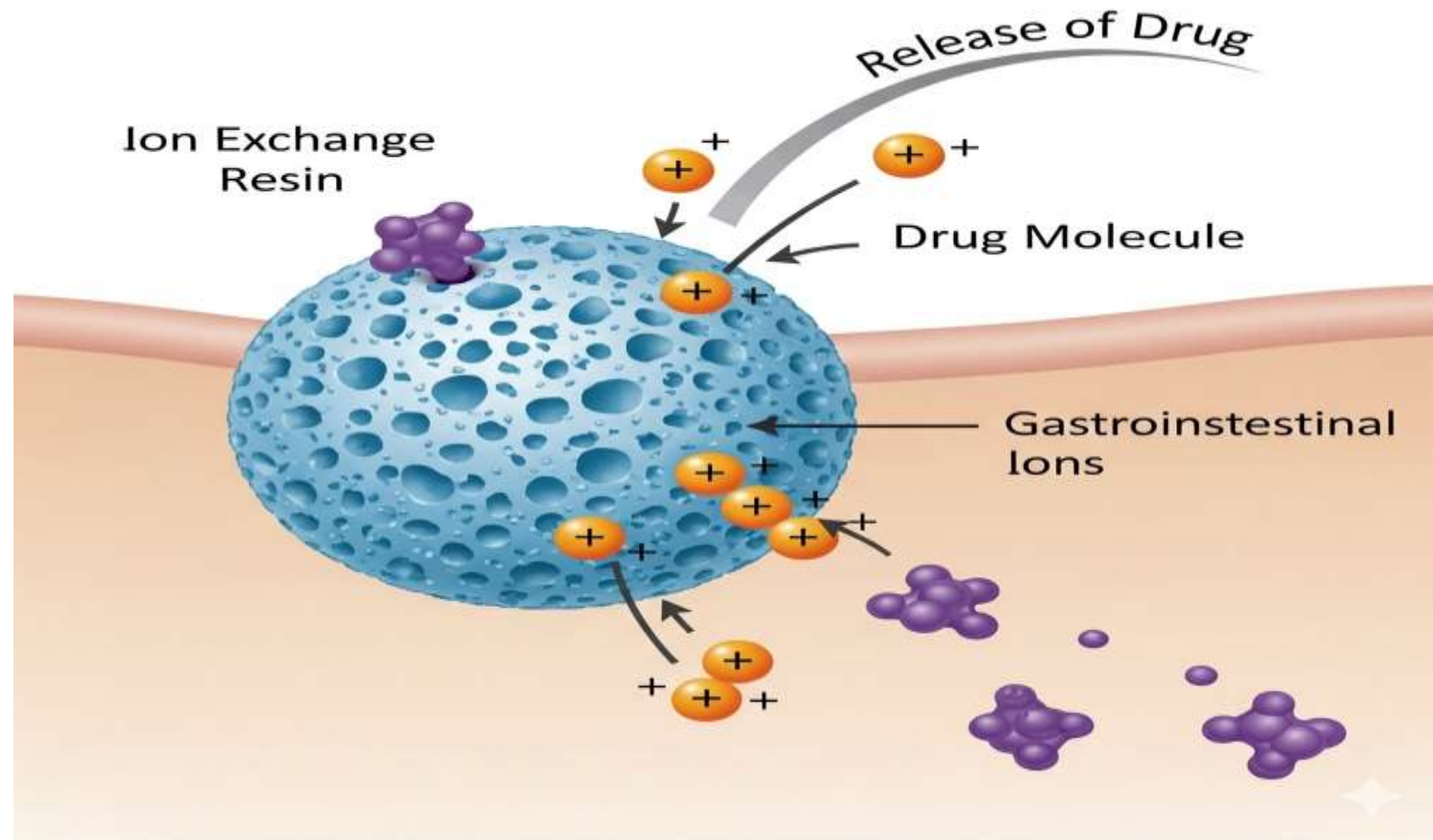
MATRIX SYSTEMS



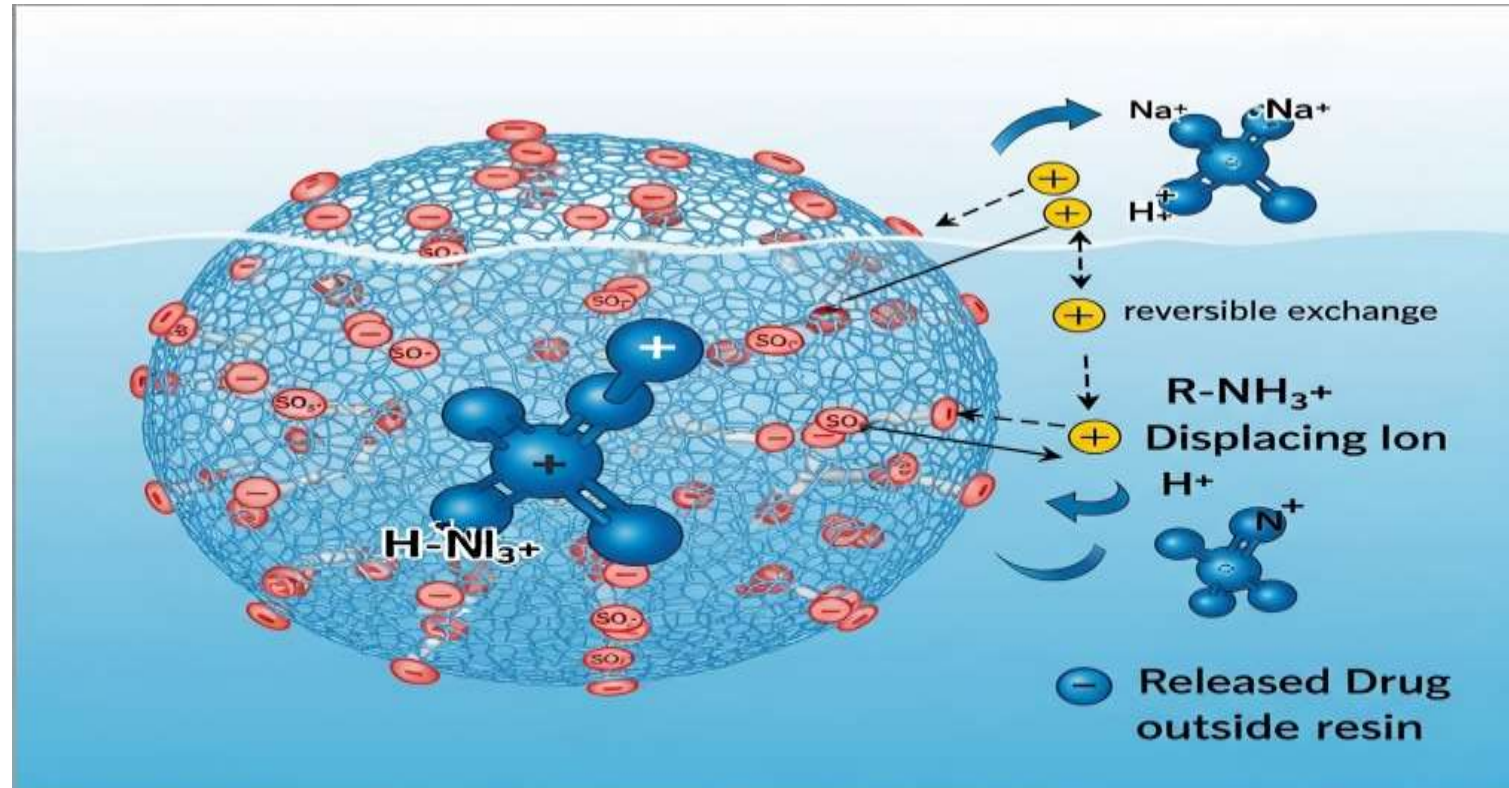
OSMOTIC-CONTROLLED SYSTEMS



ION EXCHANGE SYSTEMS



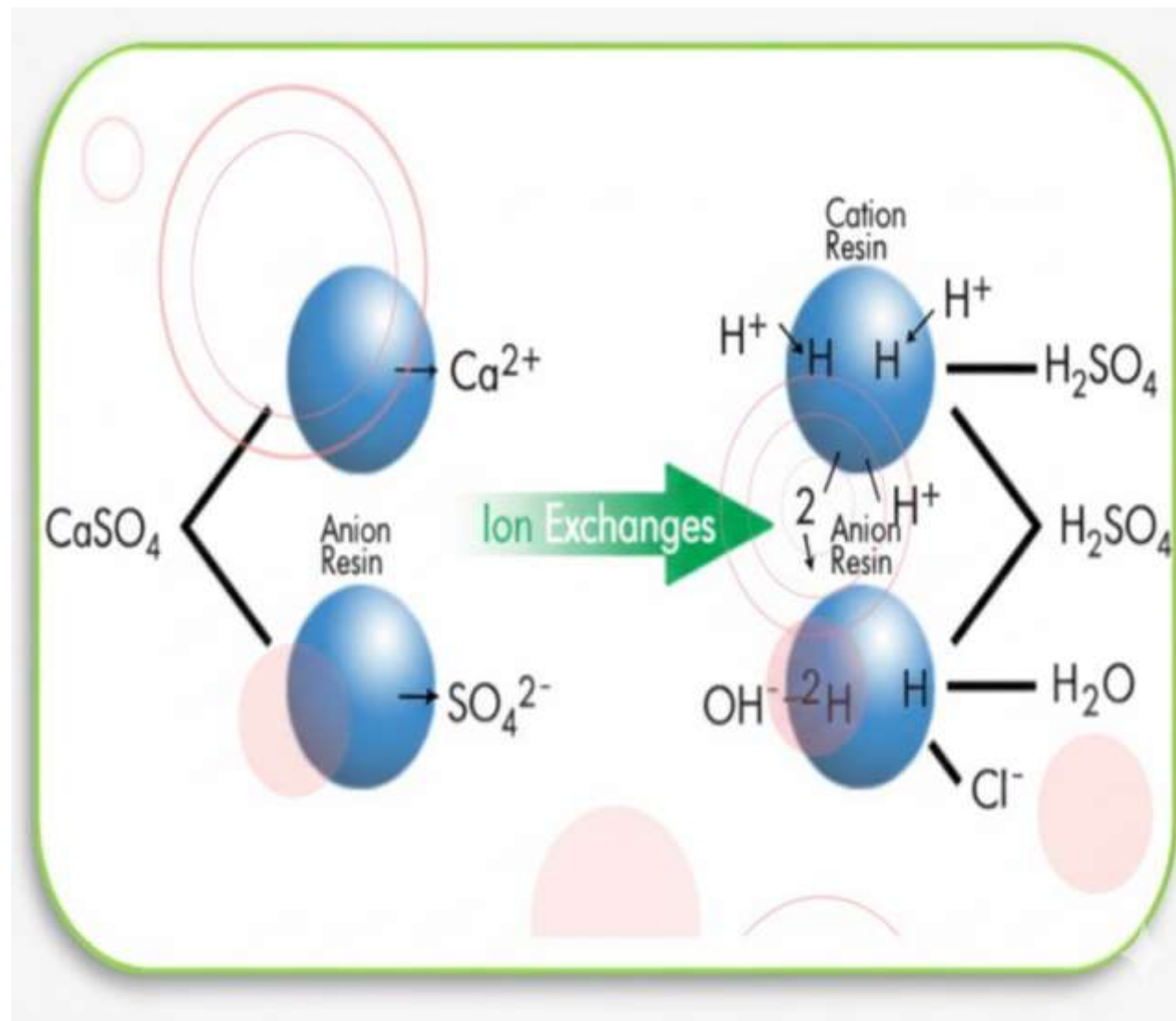
MECHANISM OF ION EXCHANGE RESINS



- Resin Matrix
 - Fixed Negative Charge

+ Bound Drug
 + Molecule

CATION EXCHANGE RESINS :



1.What is the primary advantage of Controlled Release Drug Delivery Systems (CRDDS) over conventional drug delivery?



Which drug delivery system is more advantageous for maintaining drug levels?



Conventional Drug Delivery

Requires frequent administration



Controlled Release Drug Delivery

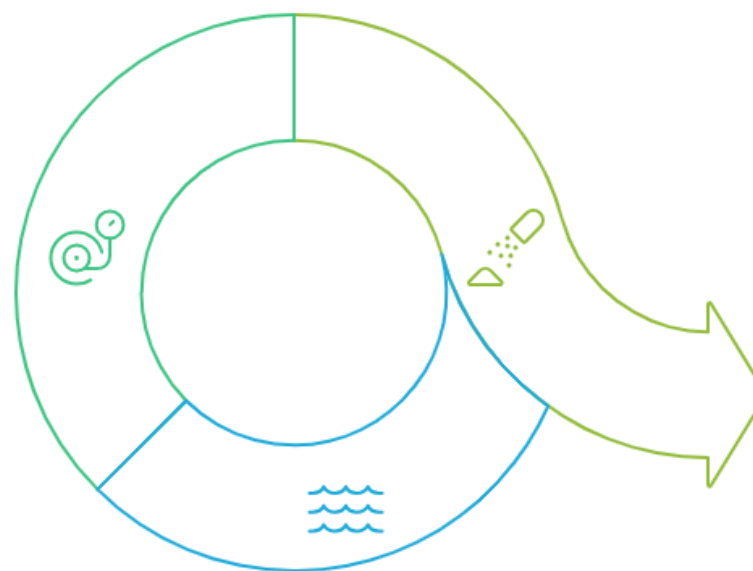
Maintains drug levels for extended periods

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2. In an osmotic-controlled system, what is the key mechanism for drug release?



What is Osmotic-Controlled Drug Release Cycle?



1

Water Absorption

Water enters the system due to osmotic pressure.

2

Pressure Buildup

Osmotic pressure increases inside the system.

3

Drug Release

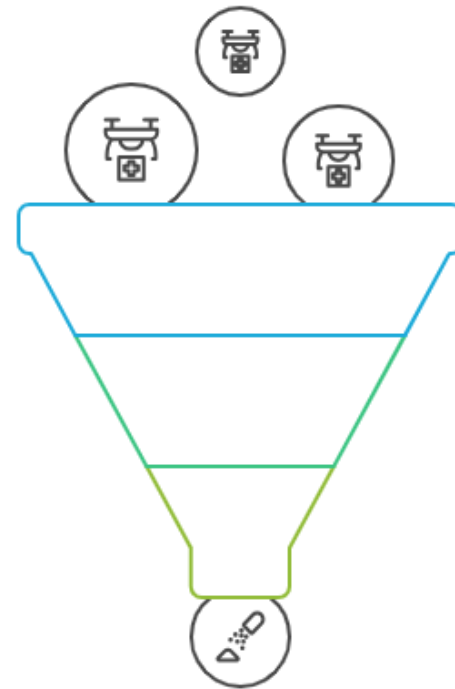
Pressure pushes the drug out through an orifice.

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3. Which type of system relies on the reversible exchange of ions between the resin and the surrounding medium to release the drug?



Reversible exchange of ions between the resin and surrounding medium



Diffusion-Controlled

Drug release through concentration gradient



Ion-Exchange

Drug release via ion exchange



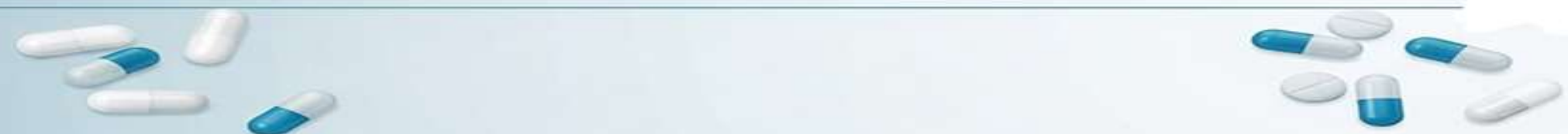
Erosion-Controlled

Drug release as the system erodes

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REFERENCES

1. Yie W. Chien: Novel Drug Delivery Systems, Second Edition, Marcel Dekker, Inc, 1992 Pg no.816.
2. Joseph R. Robinson: Sustained and Controlled Release Drug Delivery Systems, First edition, Volume 6, Marcel Dekker, Inc,1986,pg.618.
3. <https://www.sciencedirect.com/journal/journal-of-controlled-release>
4. <https://www.tandfonline.com/doi/full/10.1080/10837450.2018.1534376>
5. <https://www.scribd.com/document/668313752/Controlled-and-Novel-Drug-Delivery-by-N-K-Jain-1st-Editn-Reprint>



Thank You

