

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

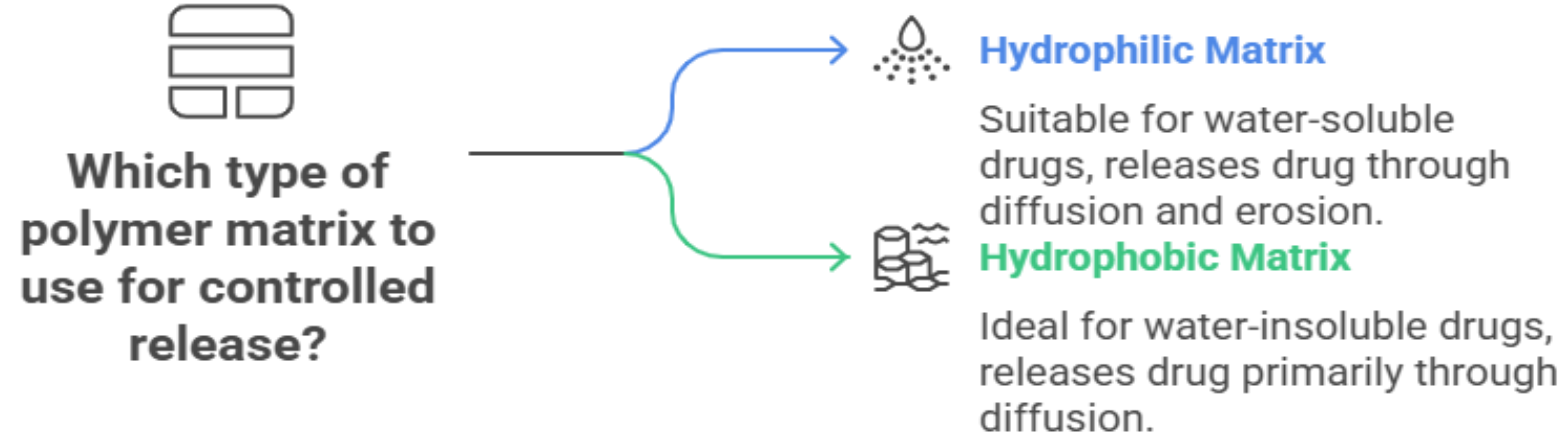
COURSE NAME : NOVEL DRUG DELIVERY SYSTEM (BP 706 T)

VII SEM / IV YEAR

TOPIC 1 :CONTROLLED RELEASE DRUG DELIVERY SYSTEM

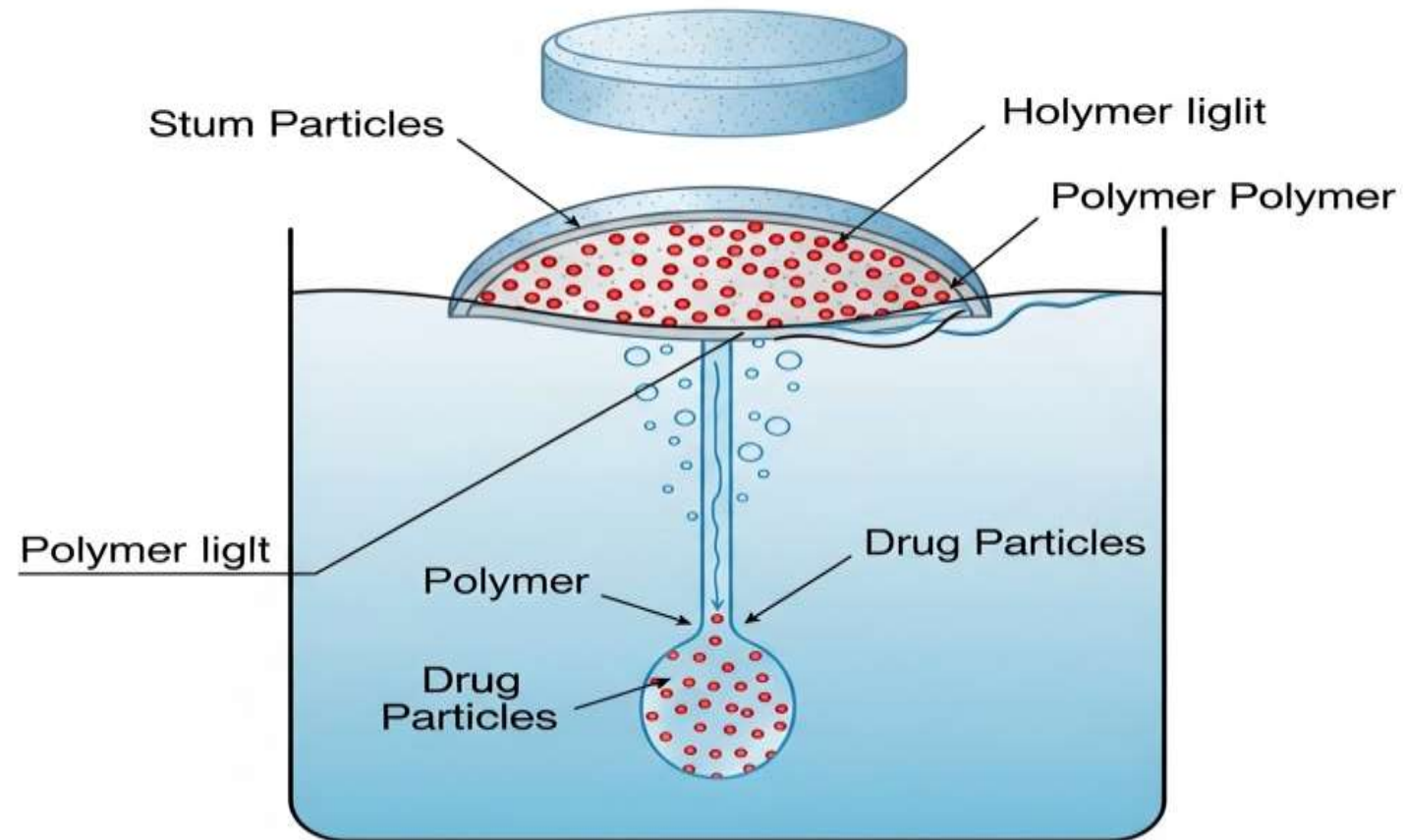
PART II

MATRIX-BASED SYSTEMS

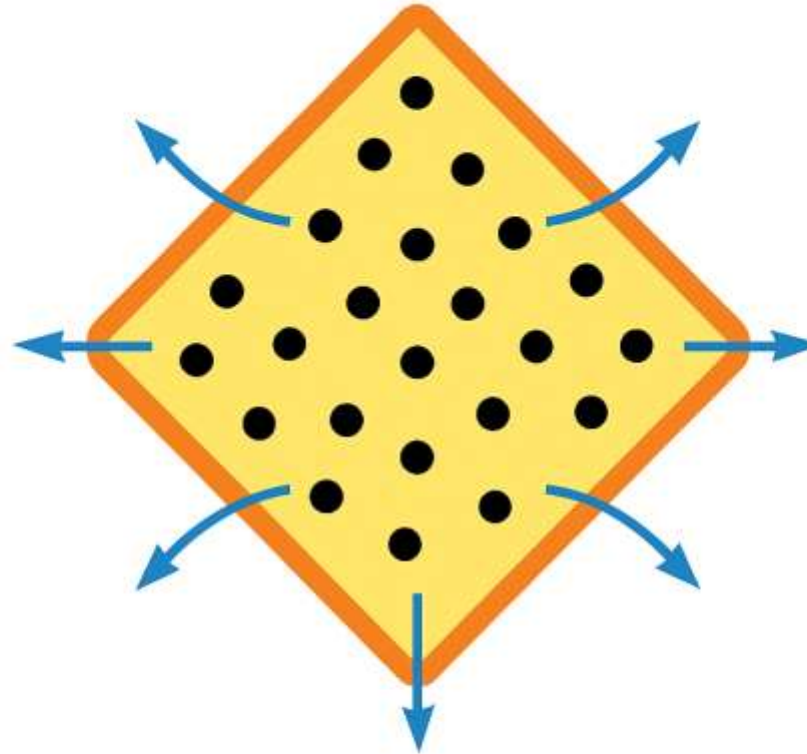


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Hydrophilic matrix system Controlled drug release



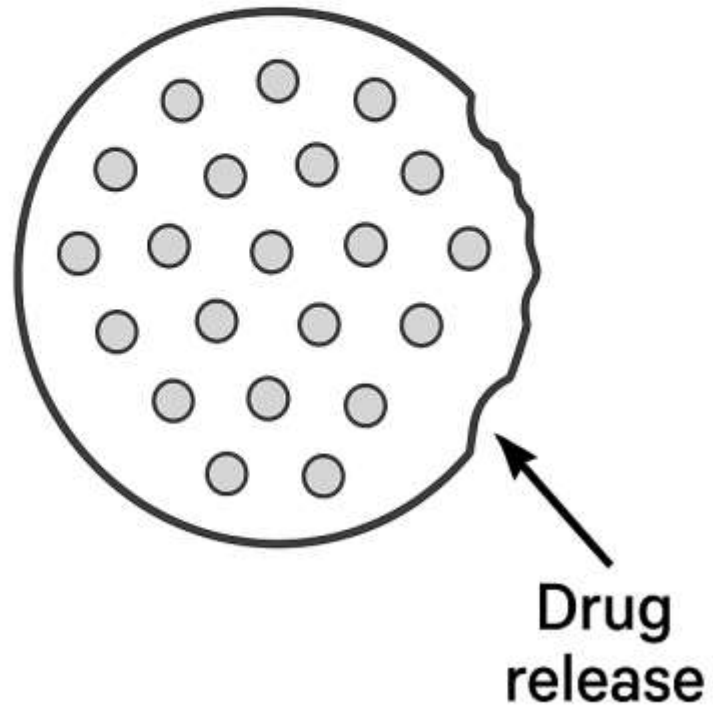
HYDROPHOBIC MATRIX SYSTEMS



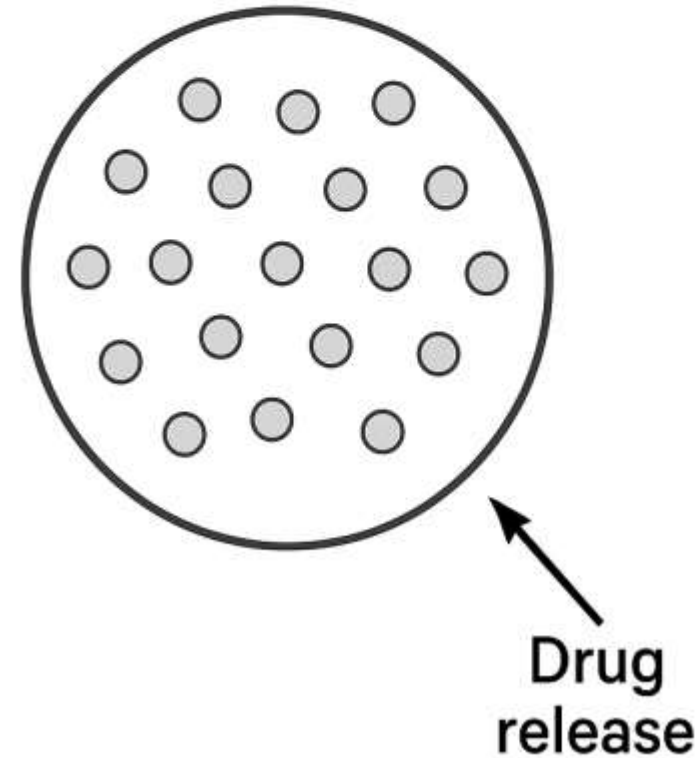
The drug is dispersed in a hydrophobic matrix (e.g., ethyl cellulose) that remains intact in the gastrointestinal tract and the drug is released by diffusion through the matrix.

Erosion-controlled system

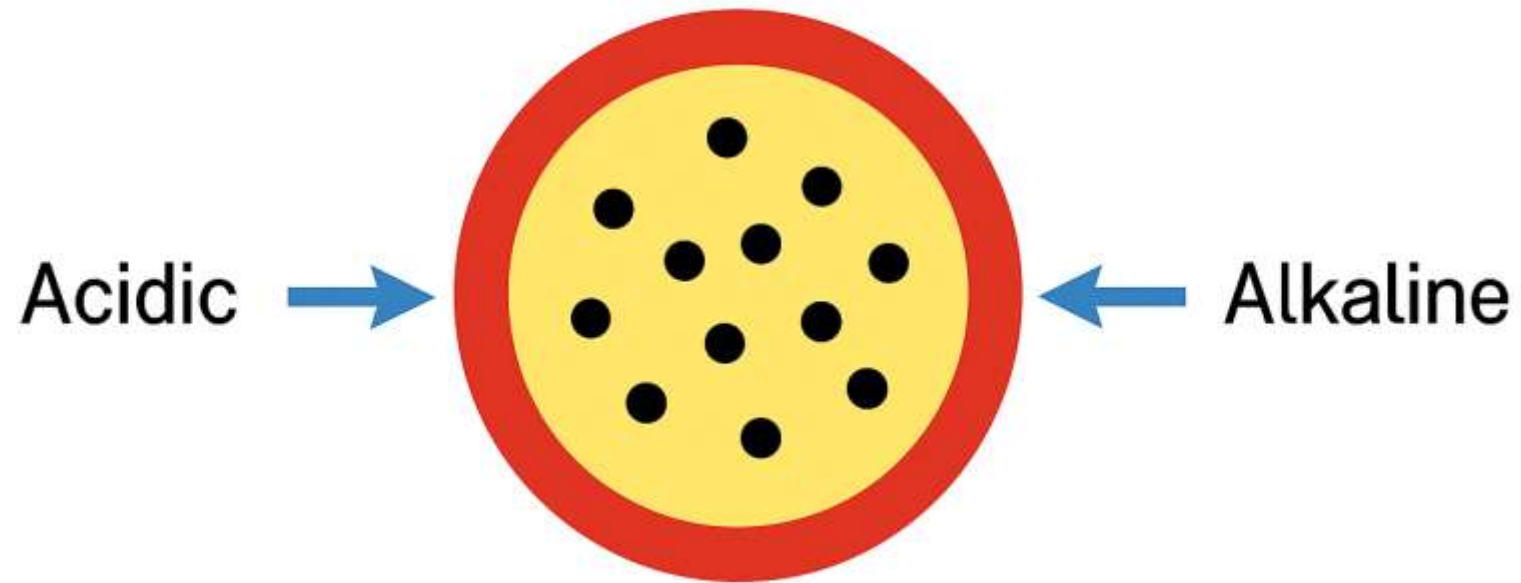
Surface erosion



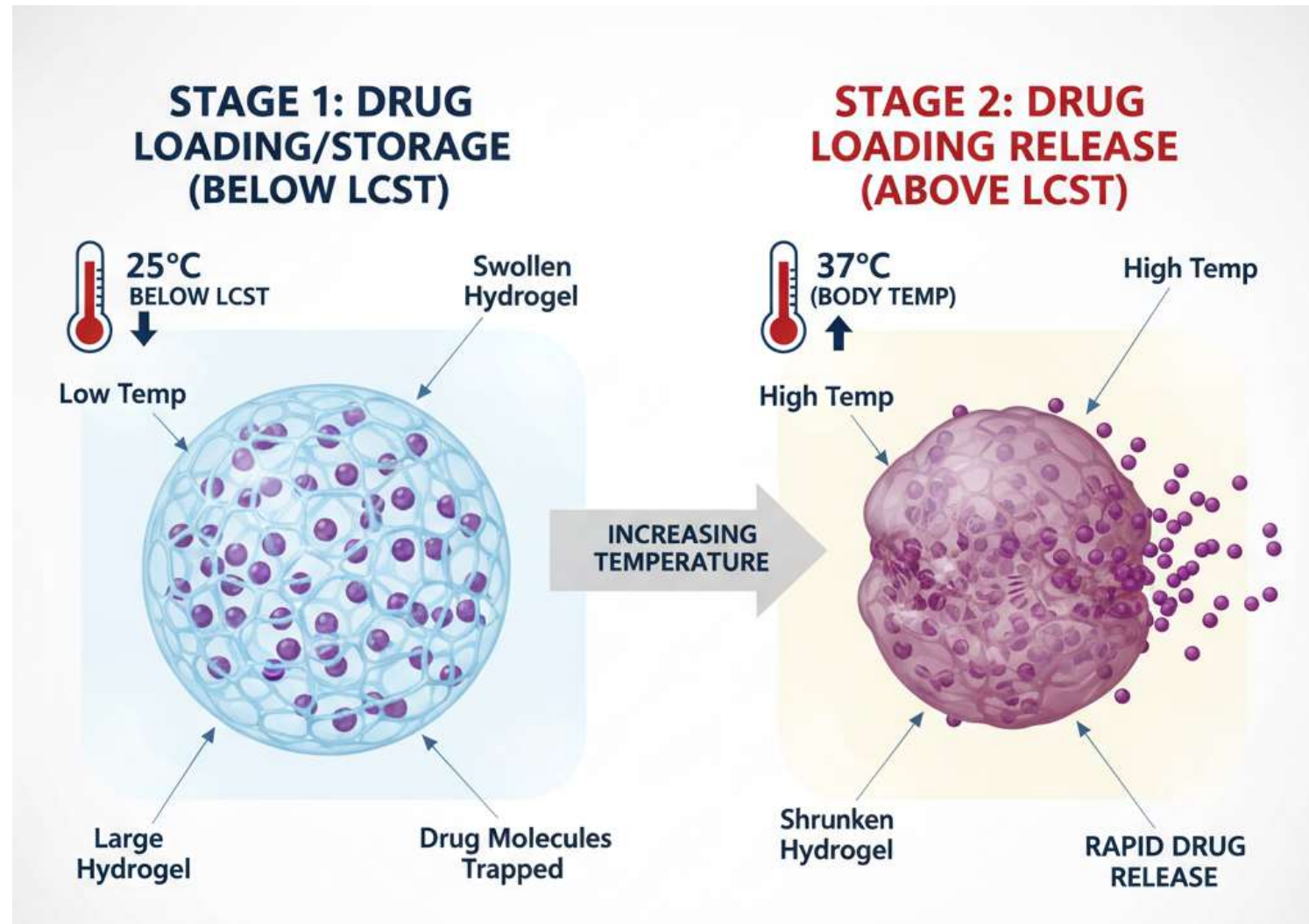
Bulk erosion



pH-RESPONSIVE SYSTEMS

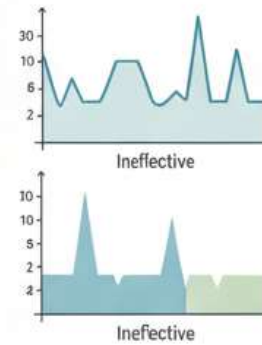
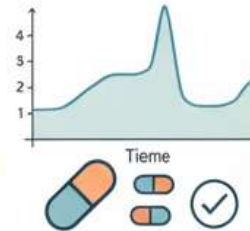


THERMO-RESPONSIVE SYSTEMS



ADVANTAGES

1. REDUCED DOSING FREQUENCY



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MAINTAINED THERAPETIC LEVEL



3. ENHANCED PATIENT COMPLIANCE



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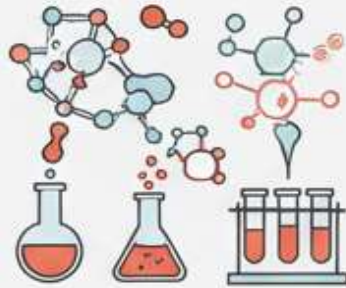
4. MINIMIZED SIDE EFFECTS



Controlled Release

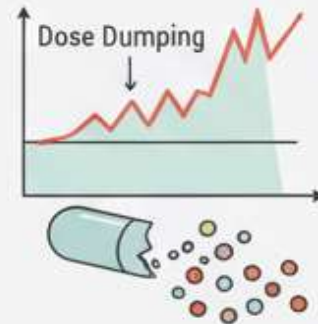
DISADVANTAGES

1. COMPLEX FORMULATION & MANUFACTURING



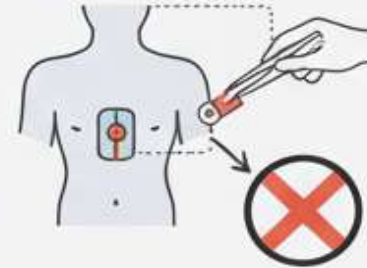
Requires specialized equipment, precise control, and multi-step processes, increasing production costs and complexity.

2. RISK OF DOSE DUMPING



System failure can lead rapid, uncontrolled release the entire drug dose, causing toxicity.

3. RETRIEVAL CHALLENGES



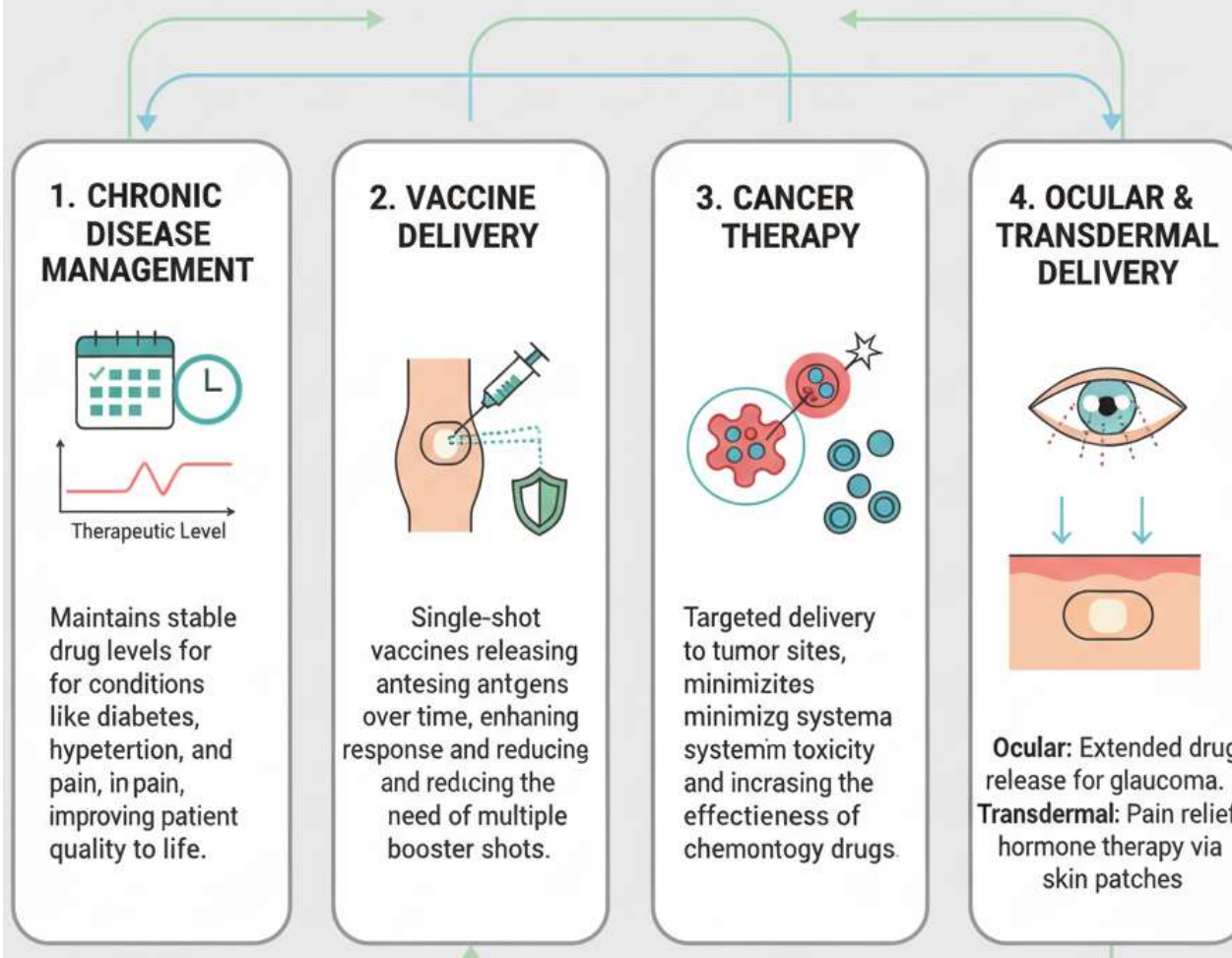
Difficult to remove the the sranty the delivery system in in case the adverse reactions or need to stop treatment.

4. VARIABLE BIOLOGICAL RESPONSE

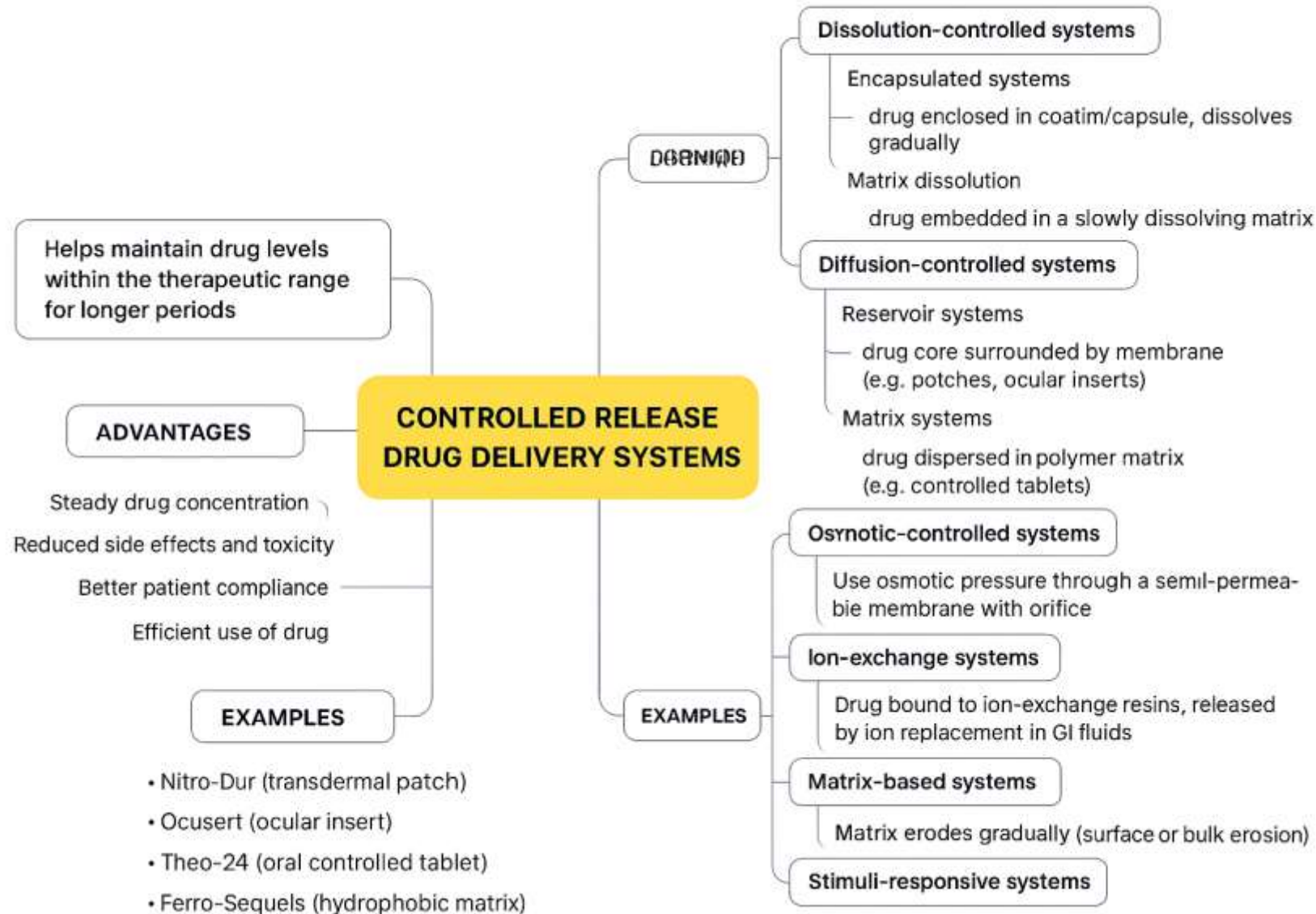


Effectiveness can vary due individual patient differences, ifferences, metabbлизм, genetics, and physsioigical conditions.

APPLICATIONS OF CONTROLLED RELEASE DRUG DELIVERY SYSTEMS (CRDDS)



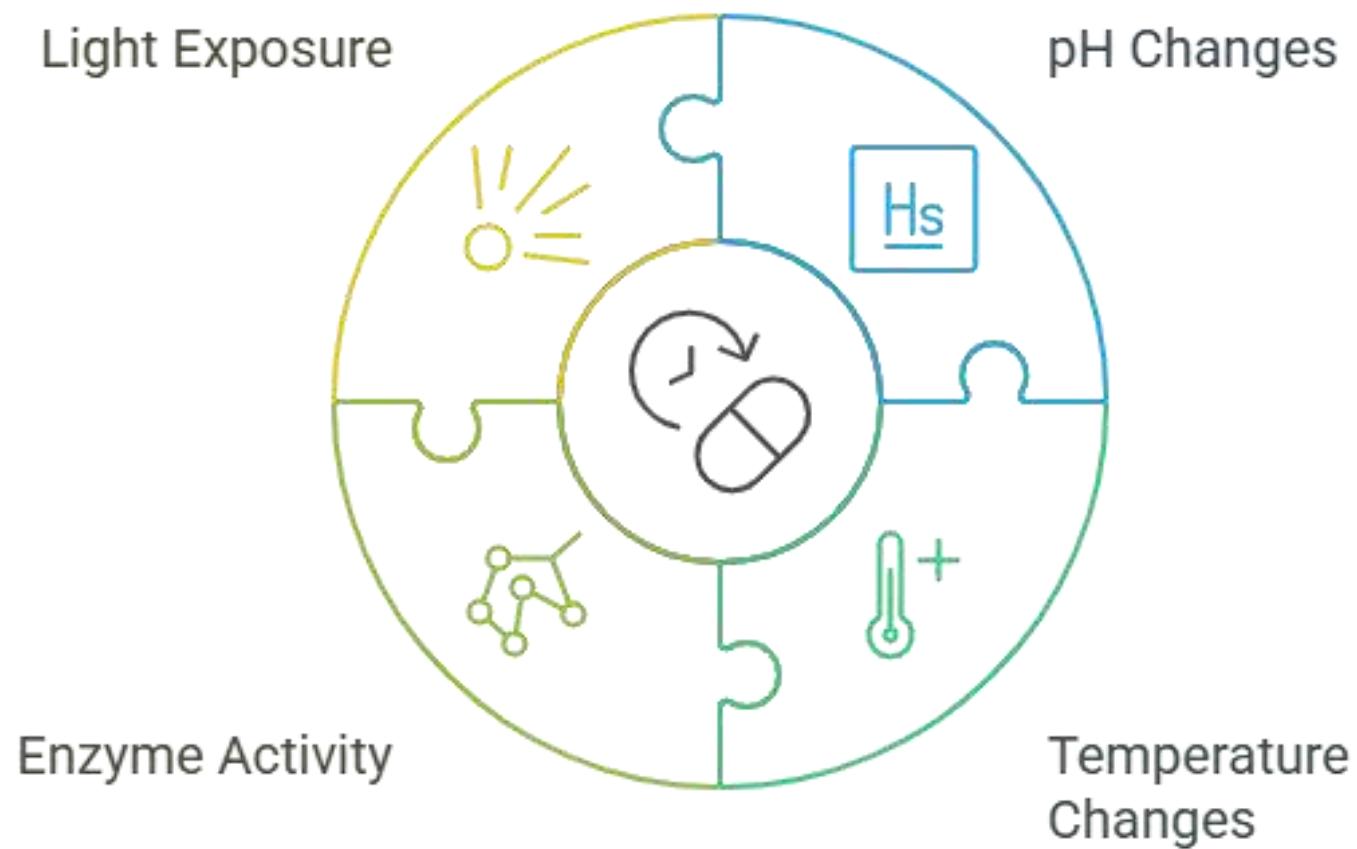
SUMMARY



1. What is the main stimulus that triggers drug release in temperature-responsive systems?



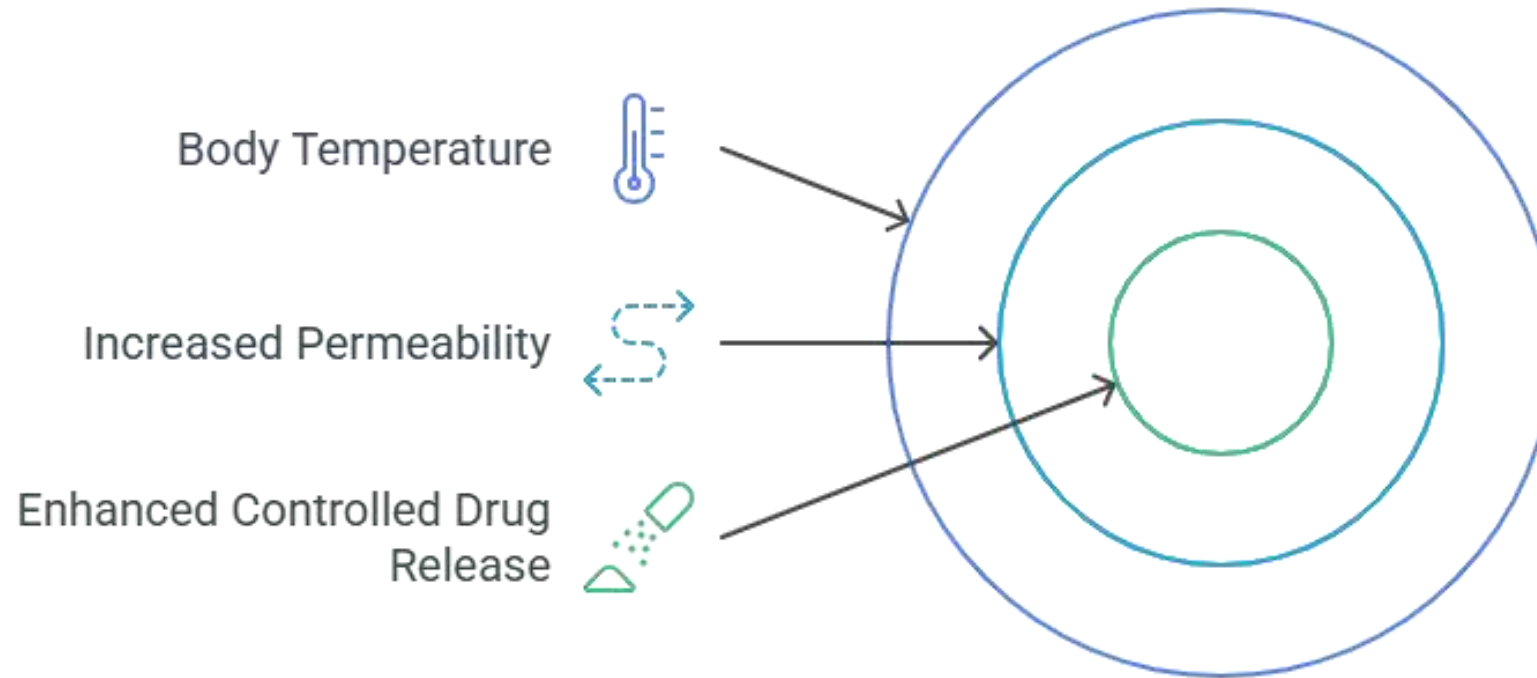
Triggers for Drug Release



The increase in permeability of hydrogels at body temperature helps in



Hydrogel Permeability and Drug Release

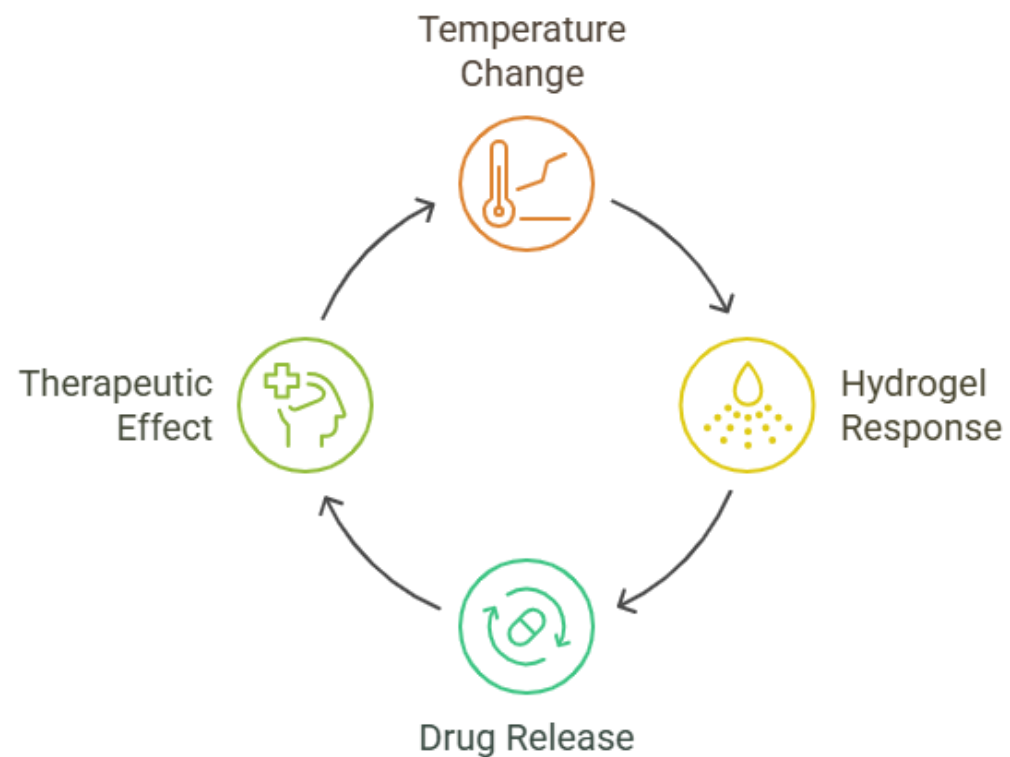


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The main mechanism behind temperature-sensitive drug release is:



Temperature-Sensitive Drug Release Cycle



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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