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: HUMAN ANATOMY & PHYSIOLOGY

(BP301 T)

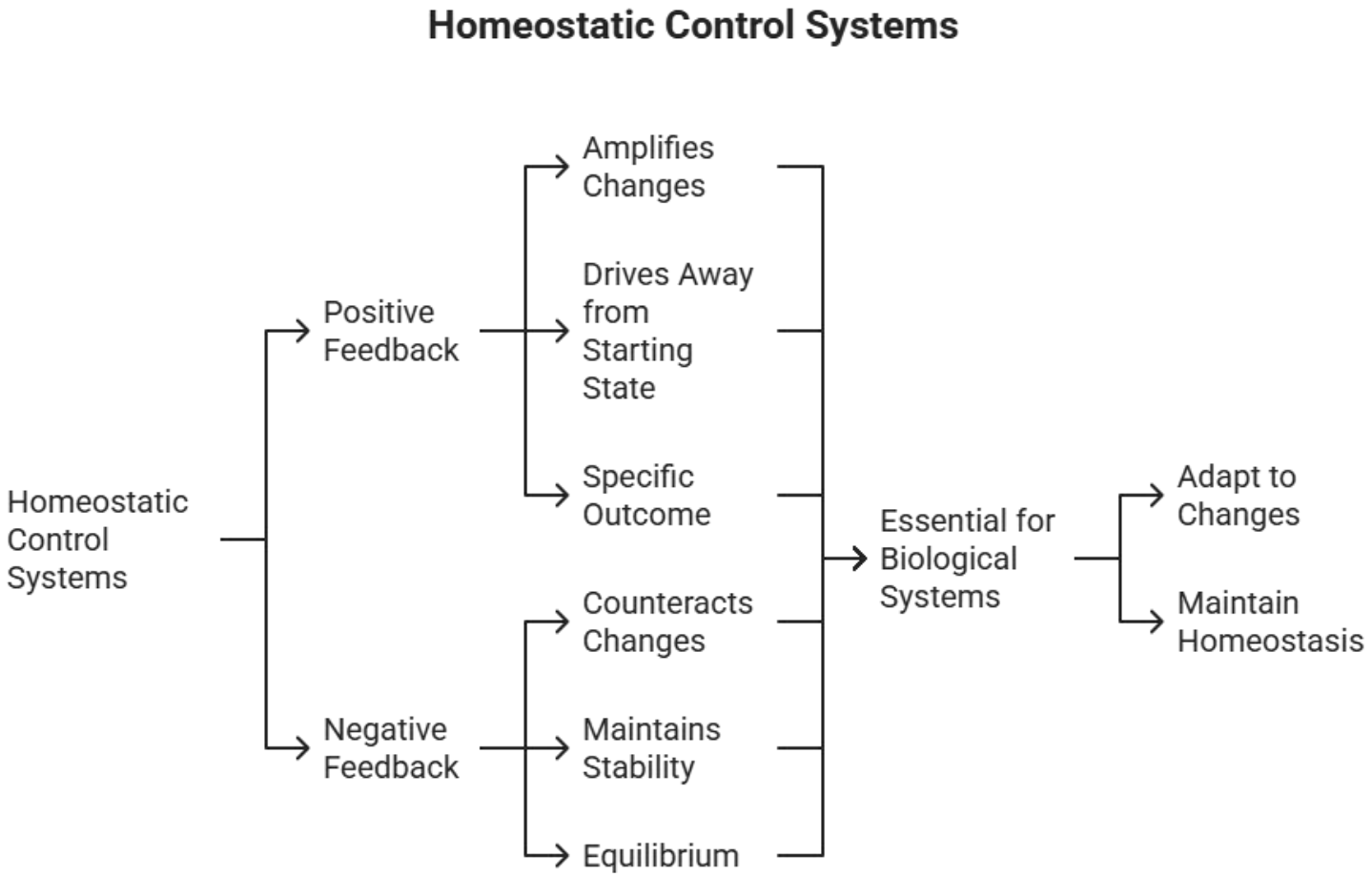
YEAR : I SEM/I YEAR

TOPIC 4 : HOMEOSTASIS

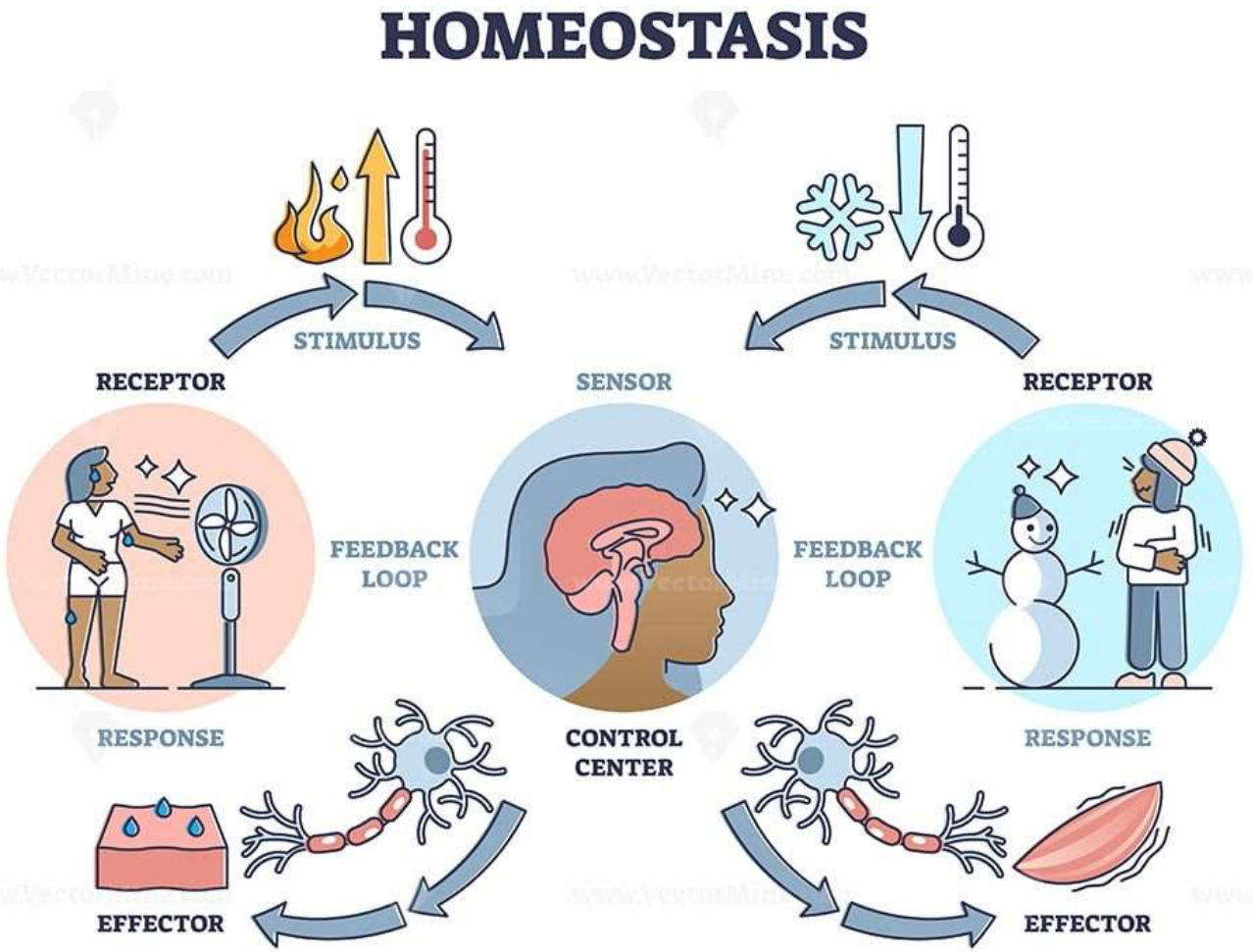
DESIGN THINKING IN HOMEOSTASIS

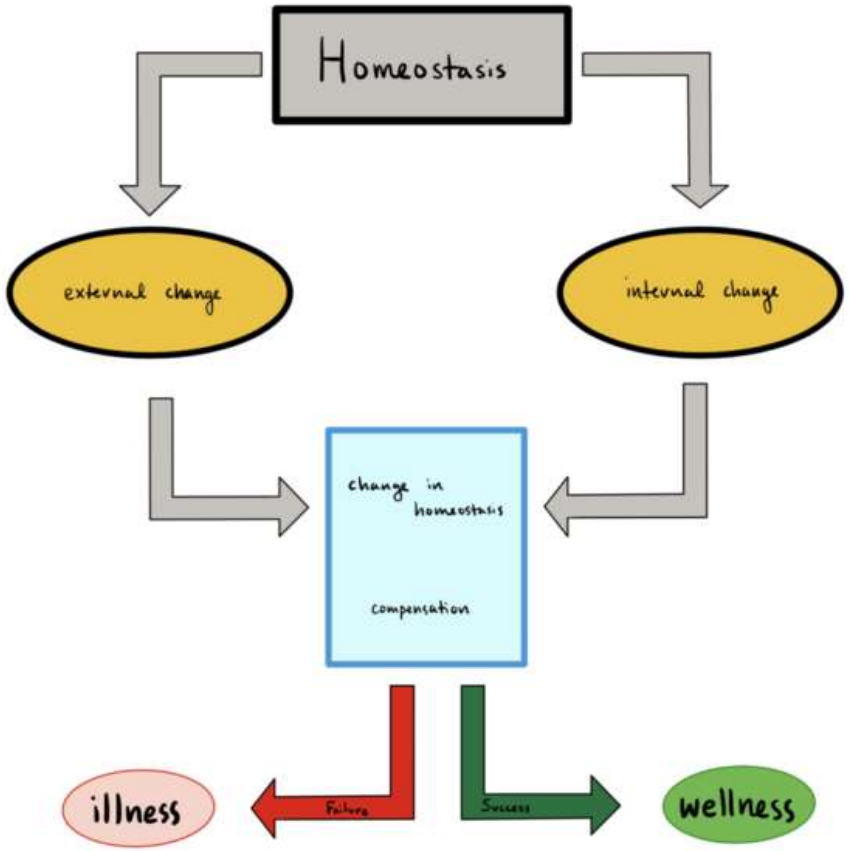
- ✓ **Empathize**: Deeply understand the challenges, needs, and experiences of body cells, tissues, and organs in maintaining balance.
- ✓ **Define**: Reframe the problem based on insights from the empathize phase and establish clear context.
- ✓ **Ideate**: Brainstorm and explore a wide range of ideas and potential solutions, including feedback mechanisms or regulatory systems.
- ✓ **Prototype**: Simulate and build models of homeostatic controls to enhance understanding and application.

MINDMAP

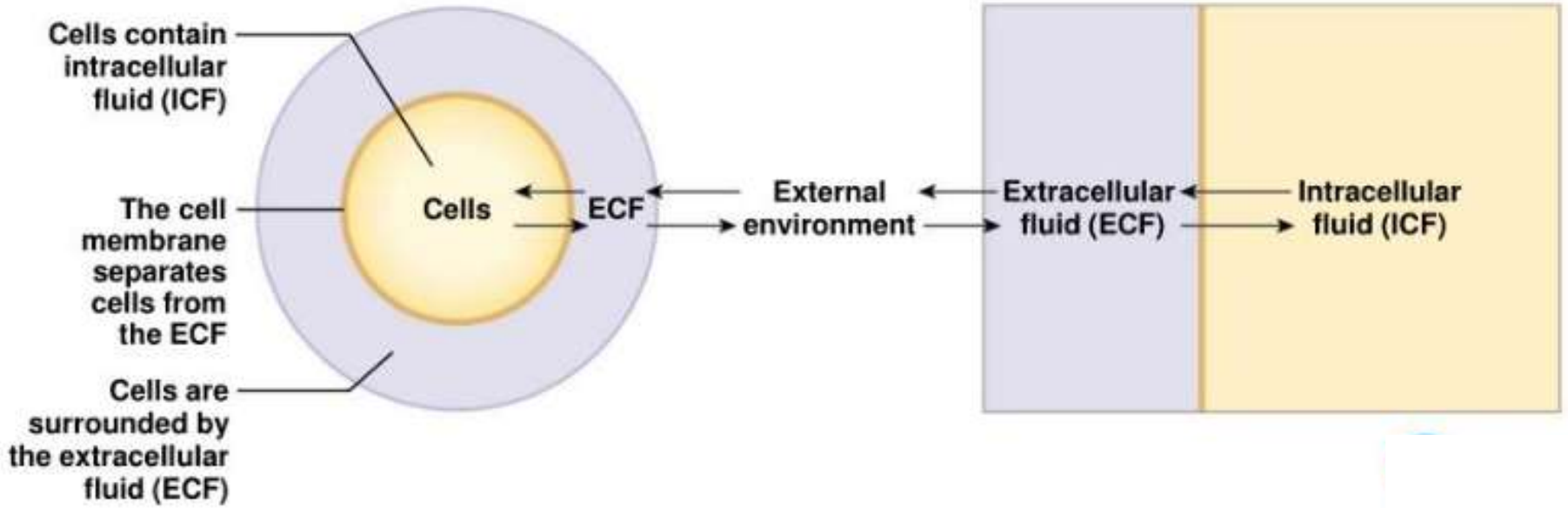

Homeostatic Control Systems
Homeostatic Control Systems
Positive Feedback
Negative Feedback
Amplifies Changes
Drives Away from Starting State
Specific Outcome
Counteracts Changes
Maintains Stability
Equilibrium
Essential for Biological Systems
Adapt to Changes
Maintain Homeostasis

HOMEOSTASIS

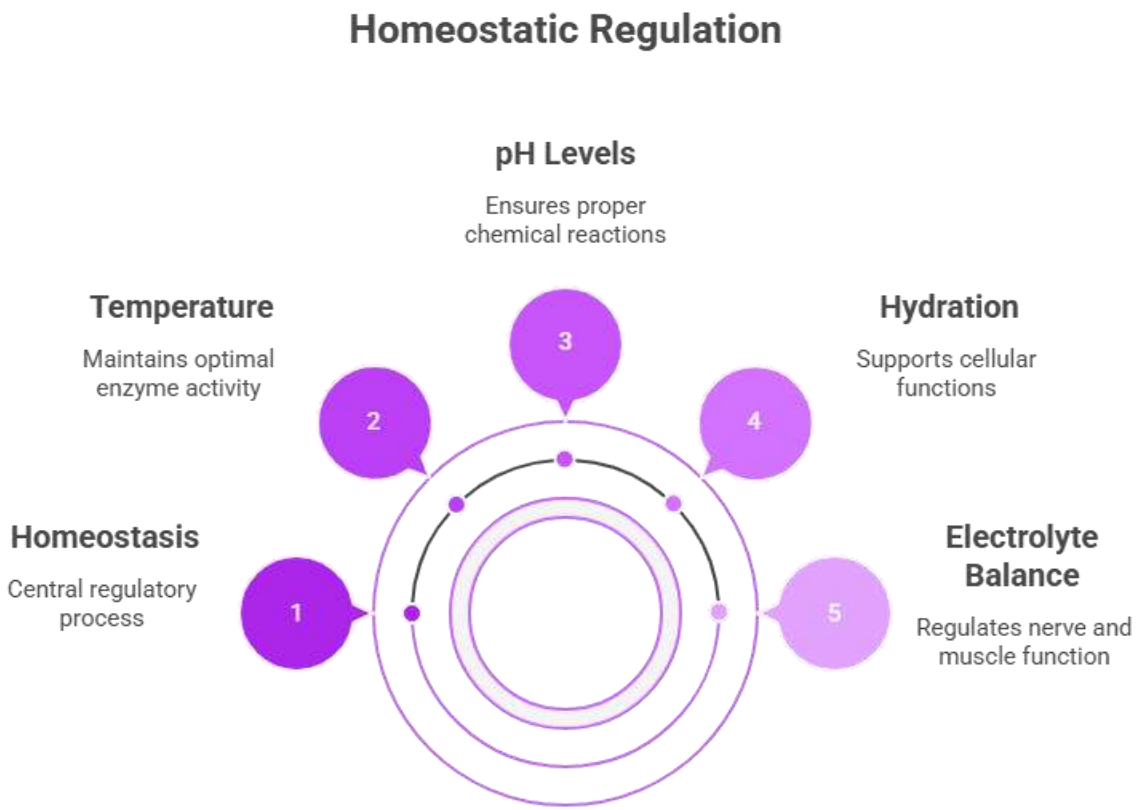



Homeostasis
external change
internal change
change in homeostasis
compensation
illness
Failure
Success
wellness

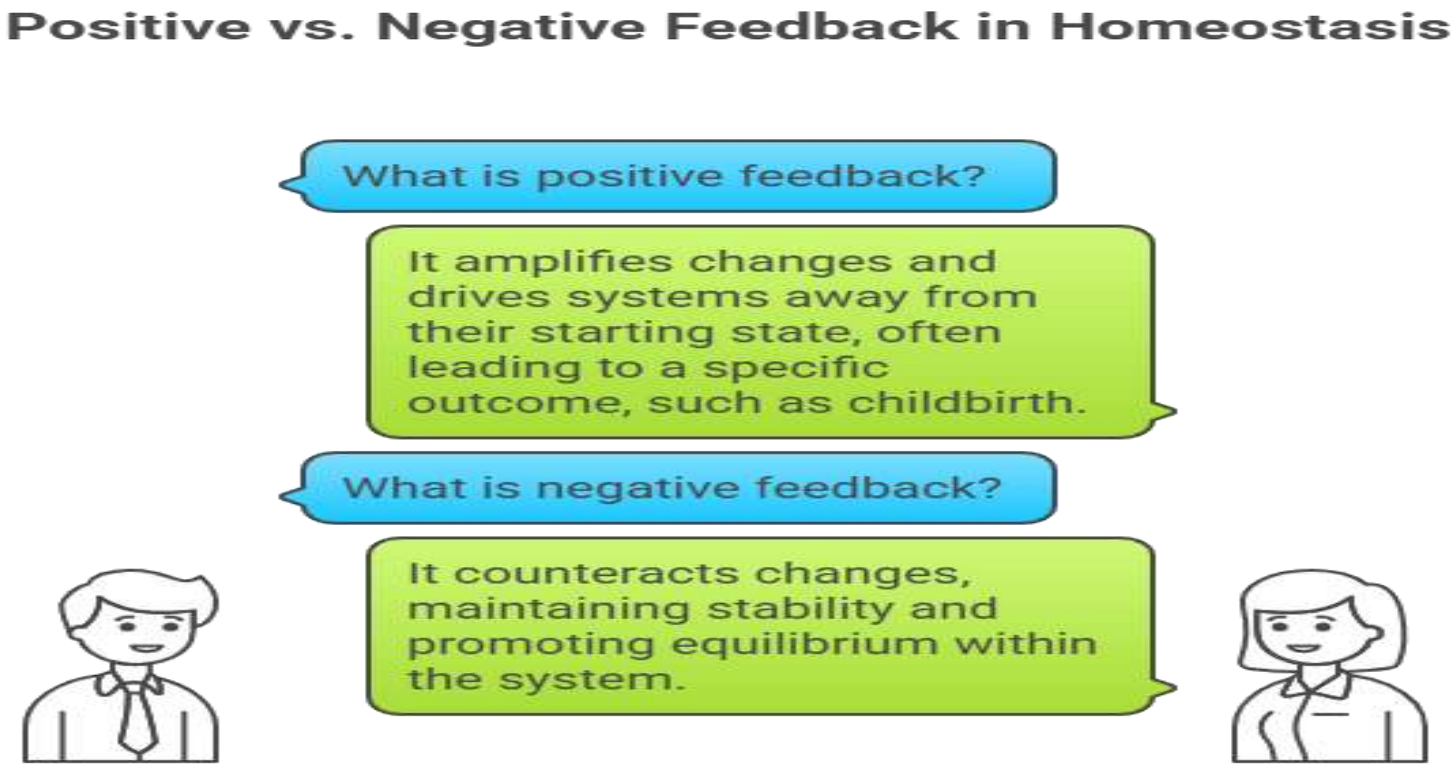
THE INTERNAL & EXTERNAL ENVIRONMENT



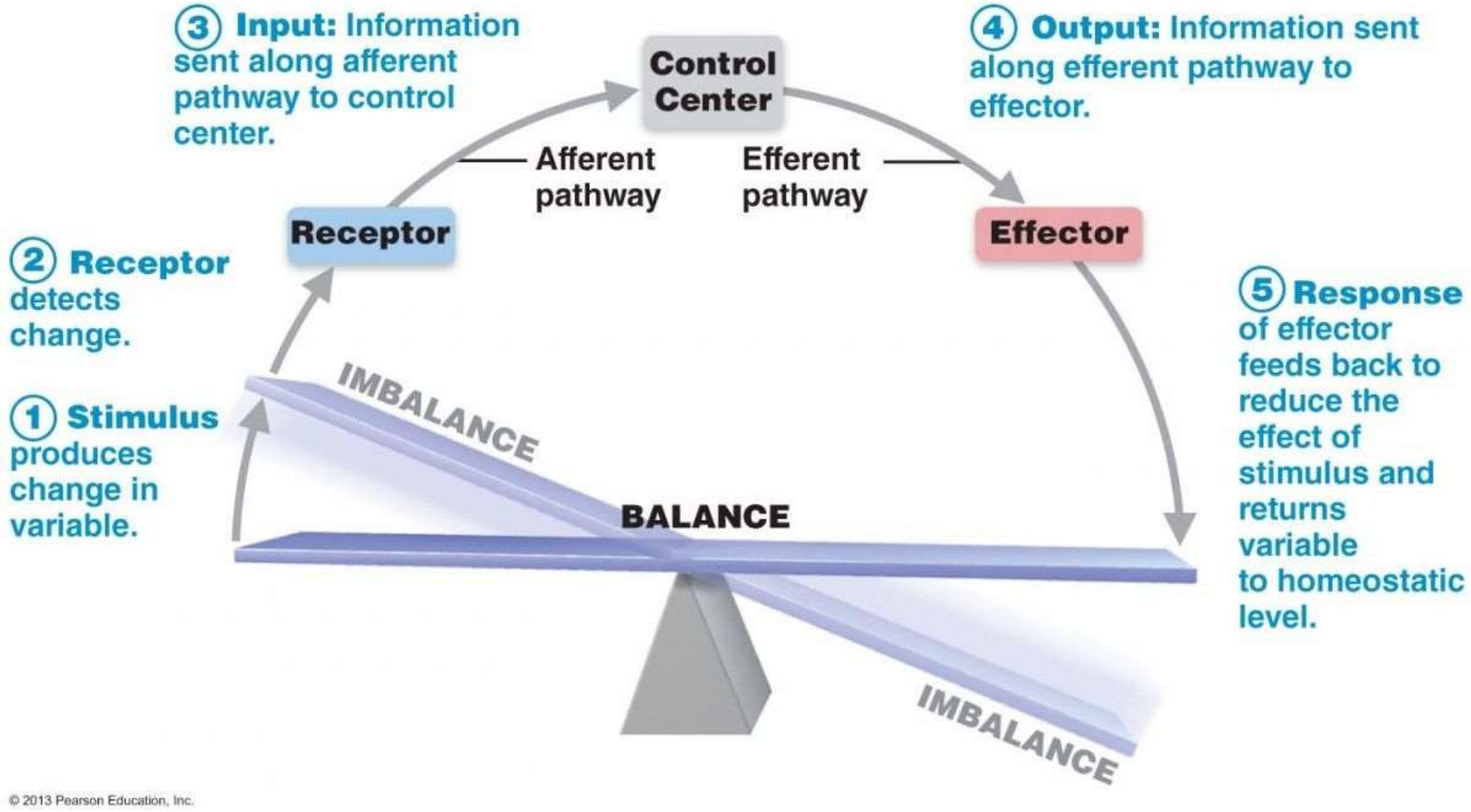
IMPORTANCE OF HOMEOSTASIS



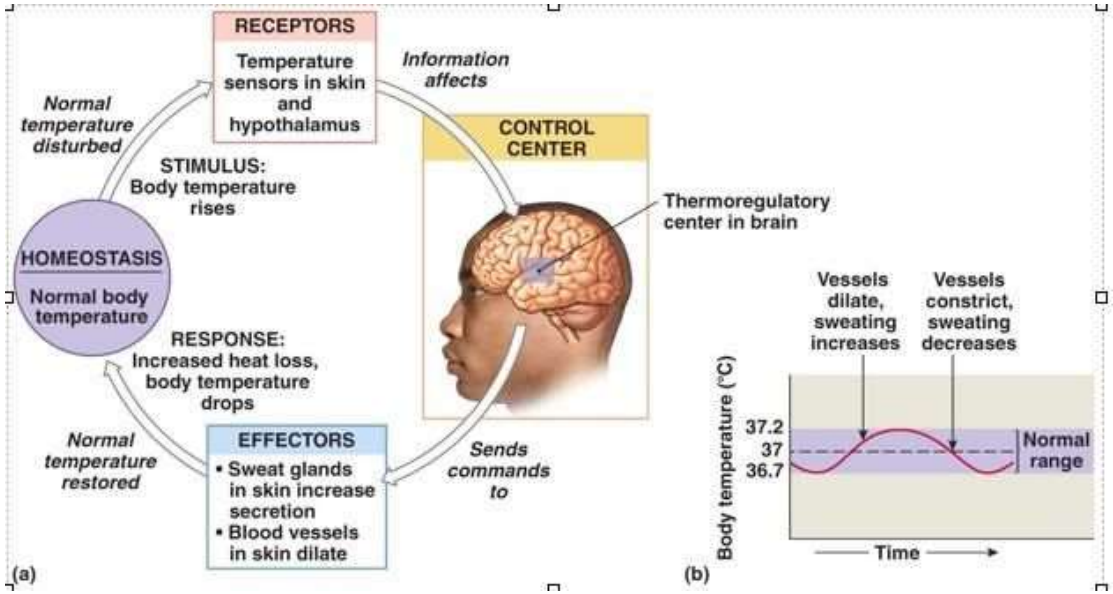
TYPES OF FEEDBACK MECHANISMS

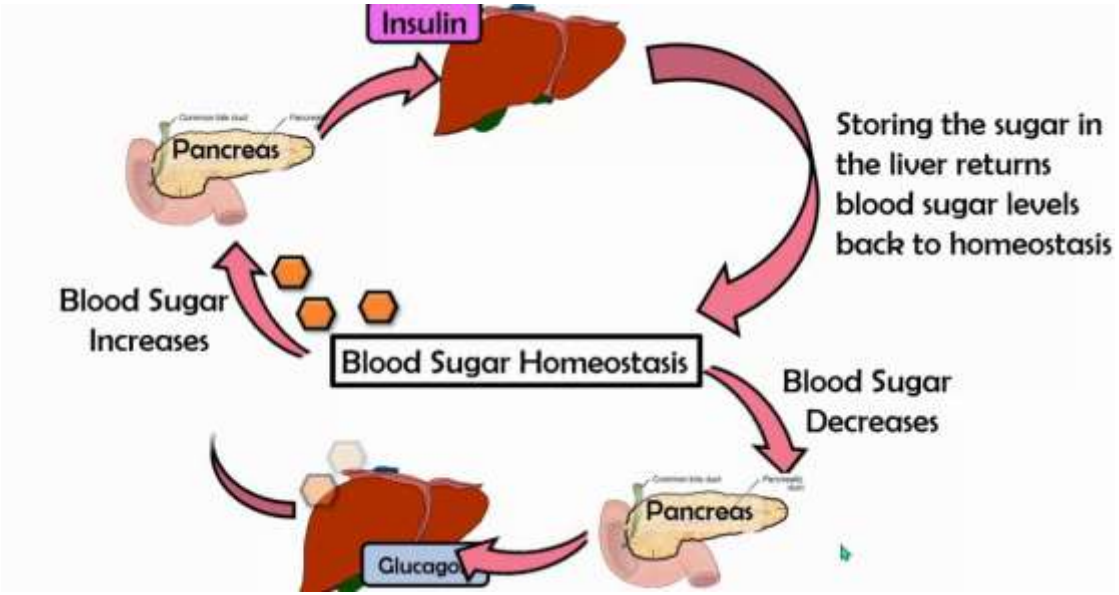


COMPONENTS OF HOMEOSTATIC CONTROL



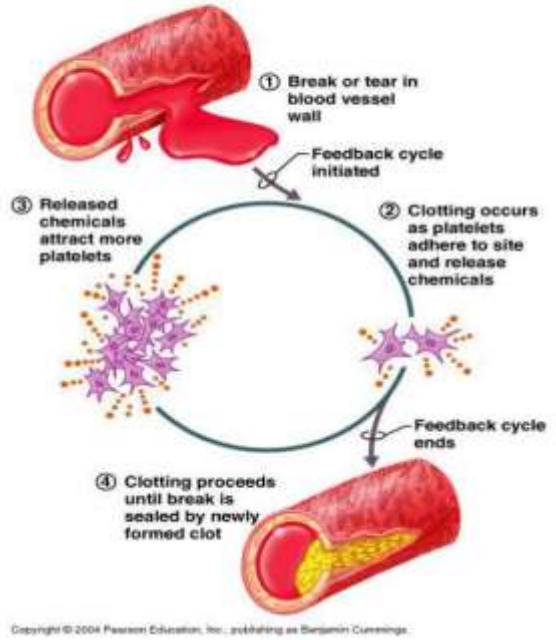
NEGATIVE FEEDBACK MECHANISMS





POSITIVE FEEDBACK MECHANISMS

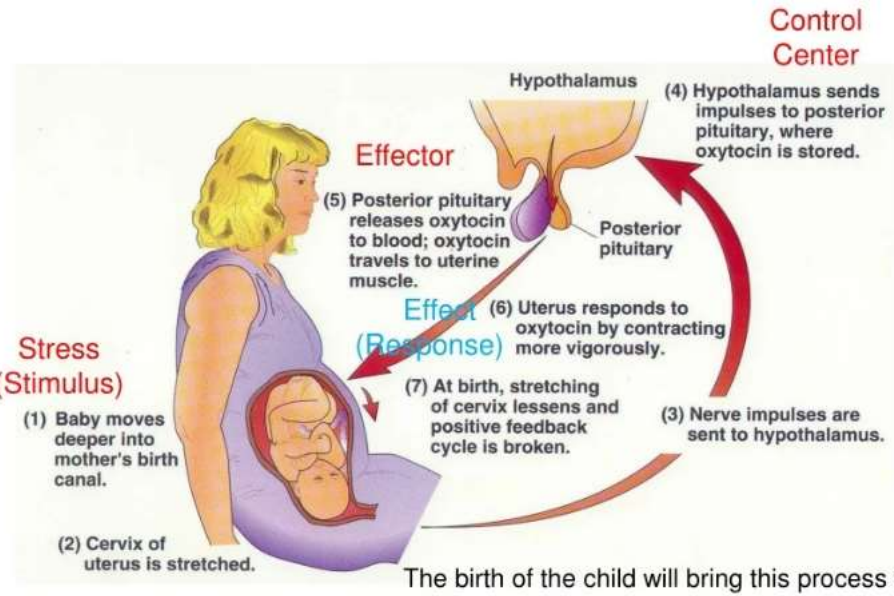
Positive Feedback Mechanisms



Examples:

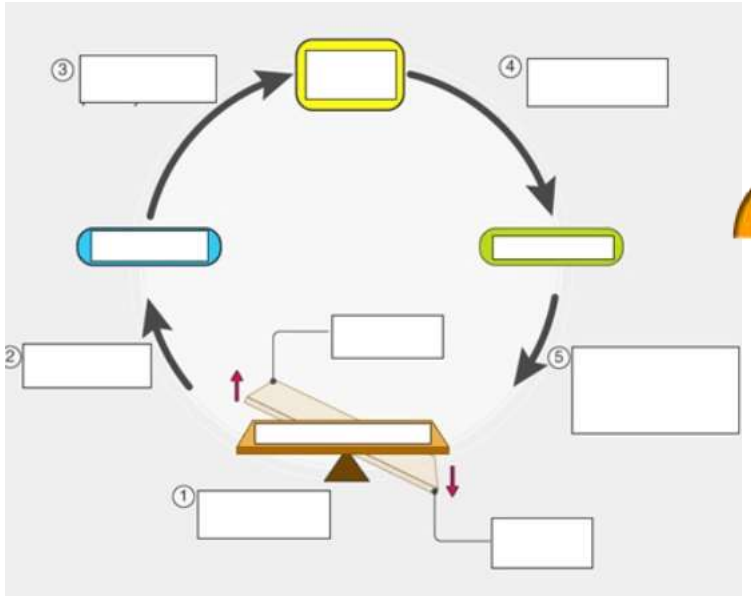
- **Blood clotting:**
  - Blood clotting is a normal response to a break in the lining of a blood vessel
  - 1. Once vessel damaged has occurred
  - 2. Blood elements called **platelets** immediately begin to cling to the injured site
  - 3. Platelets release chemical that attract more platelets
  - 4. This rapidly growing pileup of platelets initiates the sequence of events that finally forms a **clot**

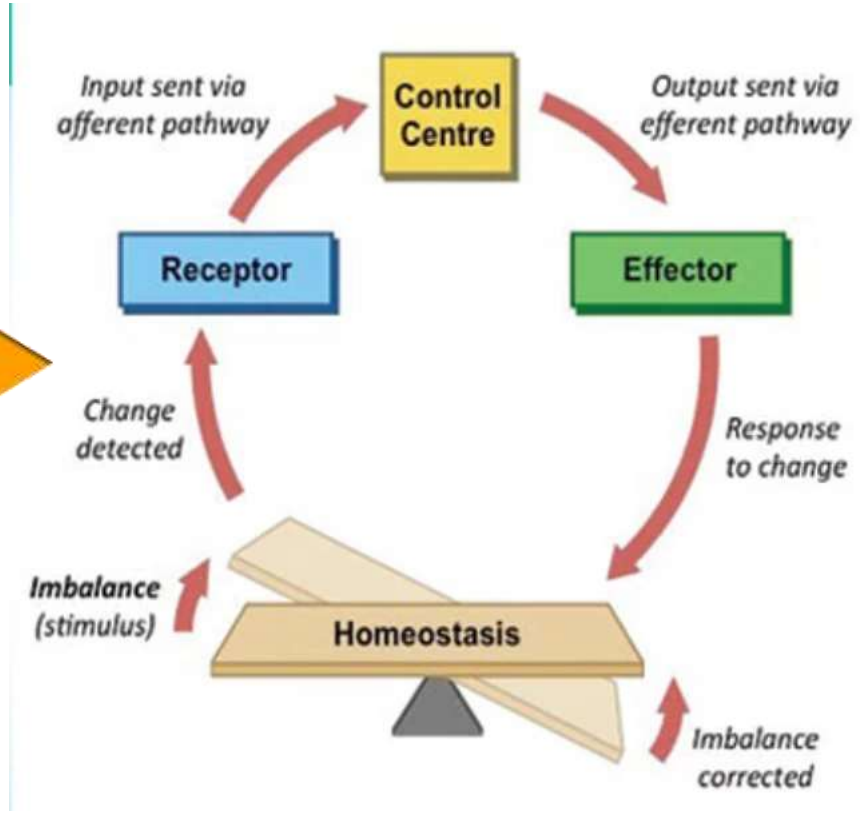
Positive Feedback - Childbirth



The birth of the child will bring this process to a close. Other examples of positive feedback regulation occur during milk letdown and blood clotting.

CLASS ASSESSMENTS





SUMMARY

- ✓ Homeostasis is a fundamental process that is essential for the survival and proper functioning of living organisms.
- ✓ By maintaining a stable internal environment, organisms can optimize cellular function and adapt to changing external conditions.
- ✓ Disruptions in homeostasis can lead to various health problems and diseases, highlighting the importance of maintaining this delicate balance.
- ✓ Understanding the principles of homeostasis is crucial for understanding physiology and disease processes.

REFERENCE

- ✓ Essentials of Medical Physiology, K. Sembulingam & P. Sembulingam (Jaypee Brothers Medical Publishers)
- ✓ A Textbook of Human Anatomy and Physiology-I, SIA Publishers
- ✓ Human Anatomy & Physiology Gerard J. Tortora & Bryan H. Derrickson (Wiley)
- ✓ Ross and wilson anatomy and physiology in health and illness, Anne Waugh &Allison Grant.
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- ✓ Marieb EN, Hoehn K: Human Anatomy & Physiology, 11th Edition, Pearson, 2019.


Thank You