

INTRODUCTION

Physiology

ORGANIZATION OF THE BODY

Atoms

Chemicals

Macromolecules

Organelles

Cells

Increase in complexity

Tissues

Organs

Systems

Skeletal

Integumentary

Endocrine

Nervous

Muscular

Cardiovascular

Respiratory

Urinary

Reproductive

Digestive

Immune



EXTERNAL AND INTERNAL ENVIRONMENTS

BODY FLUIDS

Intracellular Fluid (ICF) 2/3.

Contains potassium ions, phosphates, and proteins.

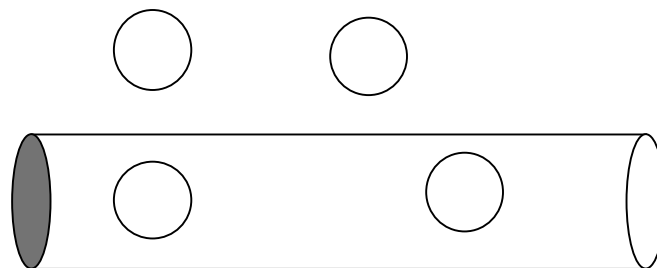
EXTRACELLULAR FLUID (ECF) 1/3.

ECF contains a large amount of sodium ions, chloride ions, and carbonate.

Plasma 20%

Interstitial Fluid 80%

Both components of ECF mix rapidly every 10-30 minutes



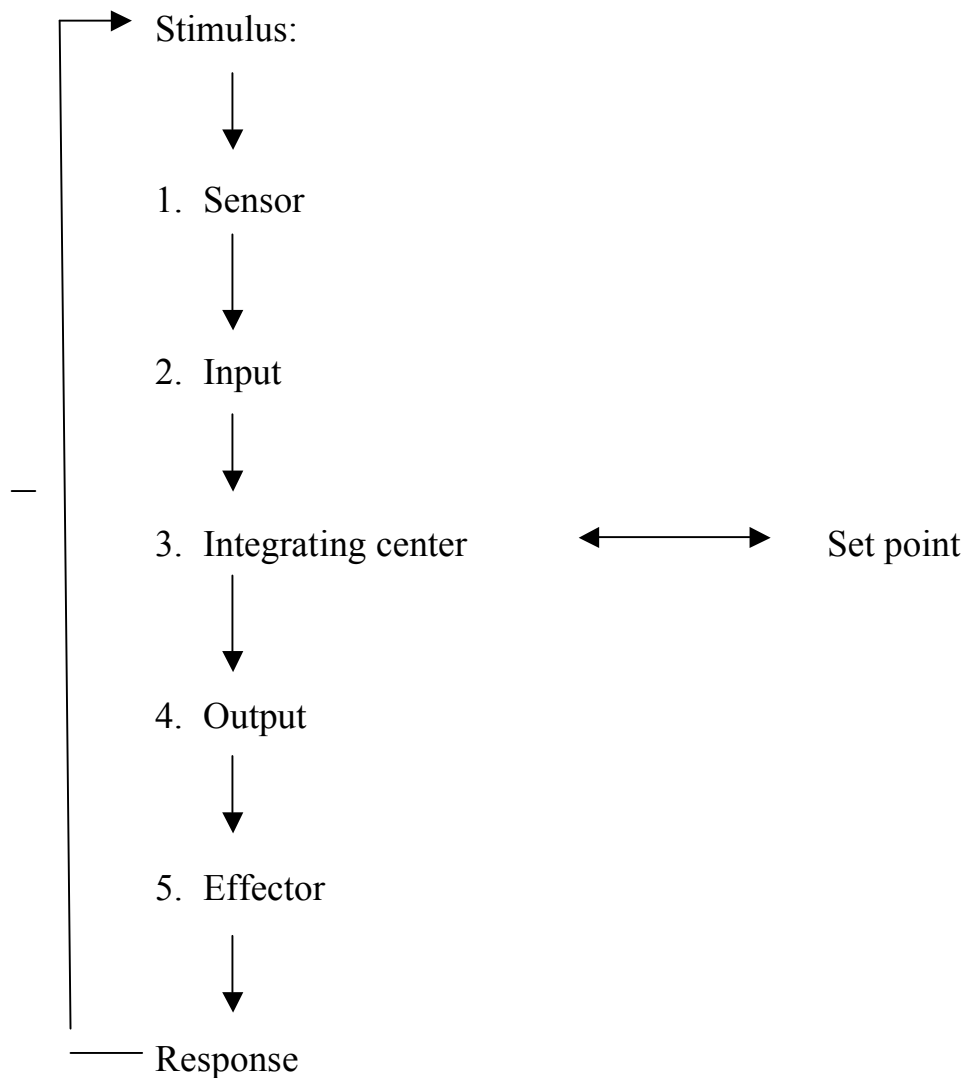
Blood vessel

HOMEOSTASIS

The internal environment remains fairly constant and is maintained through regulatory mechanisms involving nerves, hormones, or localized chemicals.

NEGATIVE FEEDBACK REFLEX CONTROL

Negative feedback is utilized to maintain homeostasis by minimizing deviations from the norm. Several elements are involved in negative feedback.



THERMOREGULATION

Homeotherms

Heat loss and gain

Temperature balance in the body depends on a dynamic equilibrium between heat gain and heat loss.

HEAT LOSS

Conduction

Radiation

Evaporation

Convection

HEAT GAIN

Internal sources include metabolic processes and muscle activity

Radiation

Conduction

REFLEXES

Thermoregulatory response to a rise in body temperature

Sensors

Input

Integrating (thermoregulatory) center

Set point (37°C)

Output

Effectors

Physiological changes

1.

2.

3.

Behavioral changes

Hyperthermia

Thermoregulatory response to a drop in body temperature

Sensors

Input

Integrating (thermoregulatory) center

Set point (37°C)

Output

Effectors

Physiological changes

1.

2.

3.

Behavioral changes

Hypothermia