

Necessary Life Functions

- **Maintain boundaries**
 - Separation of internal from external environment
- **Movement**
 - Locomotion
 - Movement of substances
- **Responsiveness**
 - Ability to sense changes and react

Necessary Life Functions (con't)

- **Digestion**

- Break-down and absorption of nutrients

- **Metabolism**

- chemical reactions within the body
- Produces energy
- Makes body structures

- **Excretion**

- Eliminates waste from metabolic reactions

Necessary Life Functions (con't)

- **Reproduction**
 - Produces future generation
- **Growth**
 - Increases cell size and number of cells

Survival Needs

■ **Nutrients**

- **Chemicals for energy and cell building**
- **Includes carbohydrates, proteins, lipids, vitamins, and minerals**

■ **Oxygen**

- **Required for chemical reactions such as the release of energy during cellular respiration**
- **Makes up 20% of the air we breathe**

Survival Needs (cont.)

- **Water**
 - 60–80% of body weight
 - Necessary for metabolic reactions
- **Stable body temperature**
 - 37 degrees C or 98 degrees F
- **Atmospheric pressure**
 - Must be appropriate level to allow for gas exchange

Interrelationships Among Body Systems

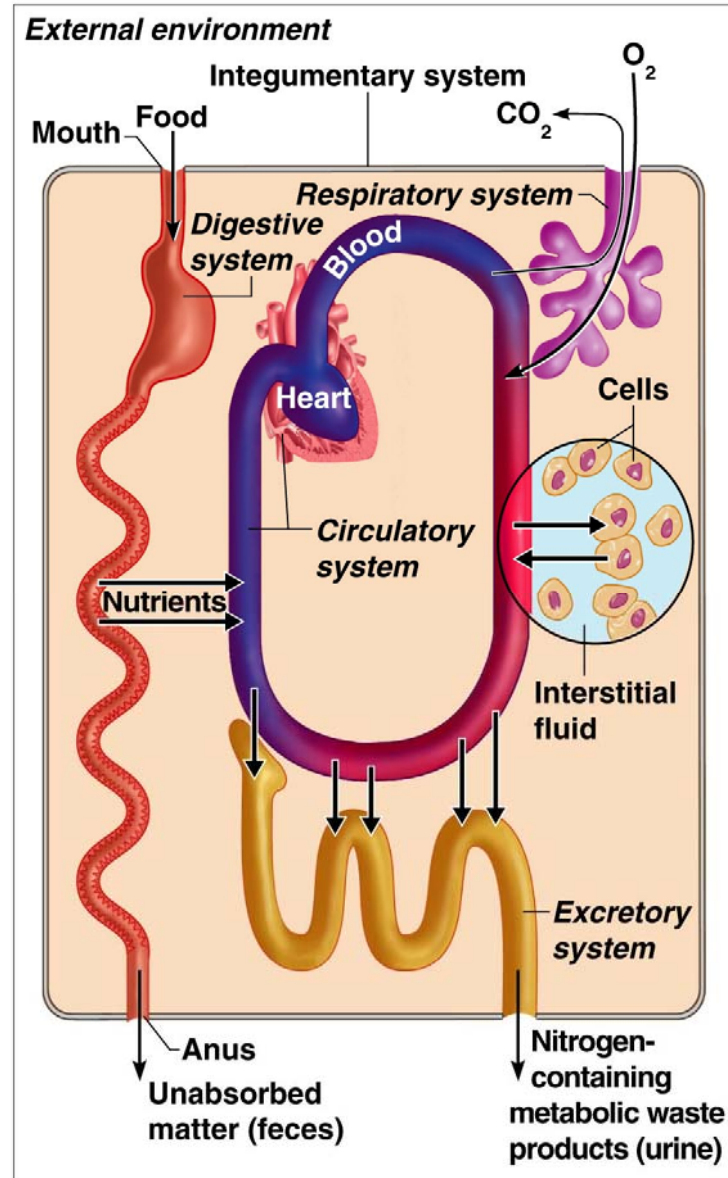


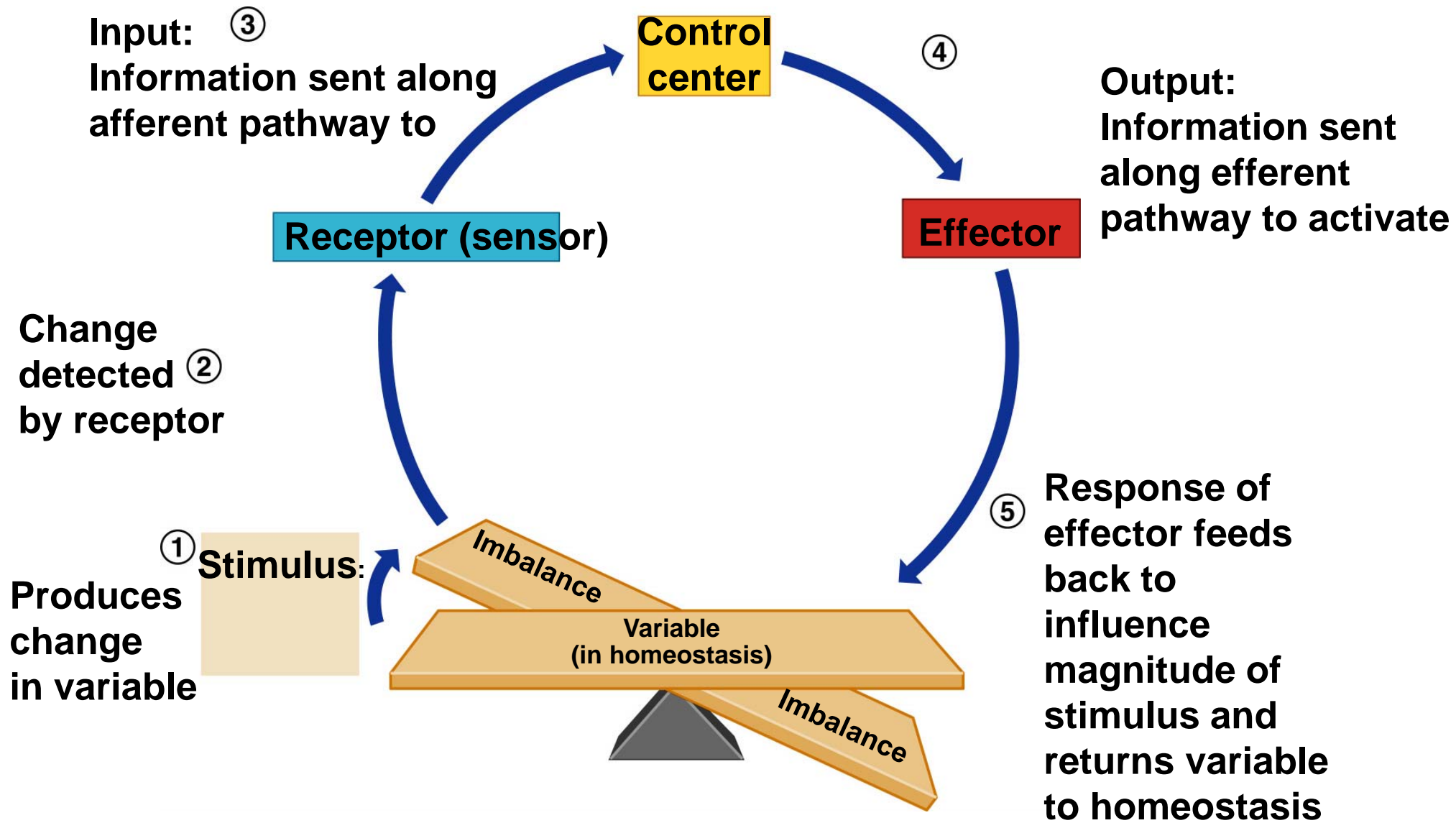
Figure 1.3

Homeostasis

- **Homeostasis:**
 - **maintenance of a stable internal environment despite continuous changes**
 - **dynamic equilibrium**
 - **necessary for normal body functioning and to sustain life**

- **Homeostatic imbalance**

- **A disturbance in homeostasis resulting in disease or illness**



Maintaining Homeostasis

Homeostatic Control Mechanisms

- **neural and hormonal control systems (Nervous & Endocrine Systems)**
 - **Receptor**
 - **Detects changes in the environment (stimuli)**
 - **Sends information to control center**

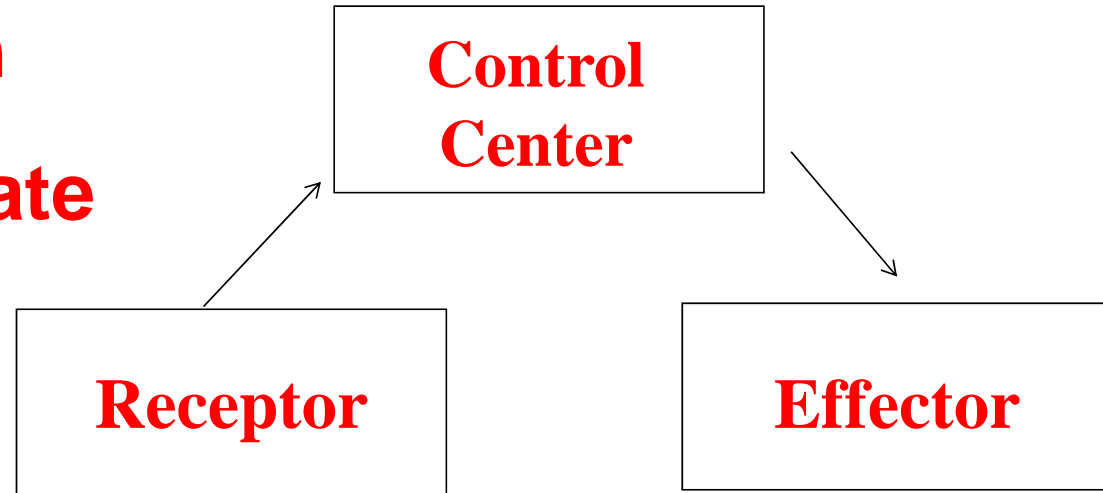
Maintaining Homeostasis (cont.)

- **Control center**

- **Determines set point**
- **Analyzes information**
- **Determines appropriate response**

- **Effector**

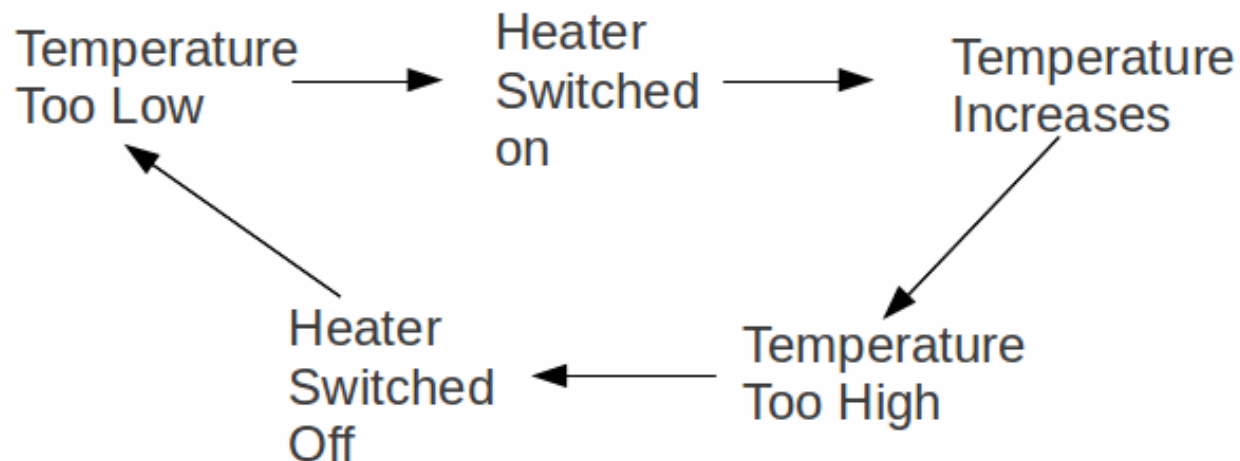
- **Provides a means for response to the stimulus**



Feedback Mechanisms

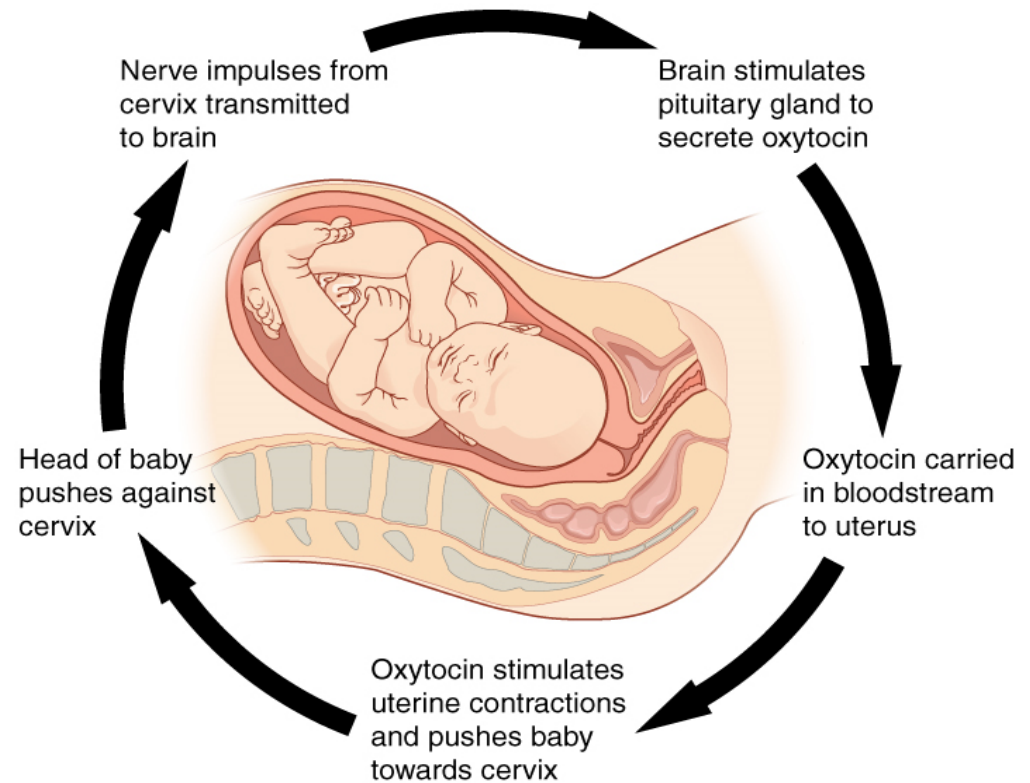
■ Negative feedback

- **Can shut off the original stimulus or reduce its intensity as well as turn on or increase its intensity**
- **Ex. a household thermostat, most hormones**



Feedback Mechanisms (cont.)

- **Positive feedback**
 - **Can ONLY increase the original stimulus to push the variable farther**
 - **Ex. blood clotting and childbirth**



Positive Feedback Loop

