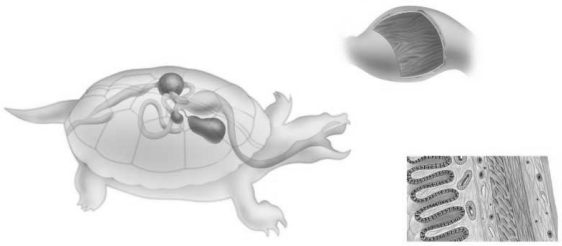
Chapter 26:
Homeostasis and the Organization of the Animal Body



Organization of the Animal Body:

Organ System	Two or more organs working together in the execution of a specific bodily function	the nervous system
Organ	A structure usually composed of several tissue types that form a functional unit	the brain
Tissue	A group of similar cells that perform a specific function	nervous tissue
Cell	The smallest unit of life	nerve cell

Tissue: Cells that are similar in structure and perform a specialized function

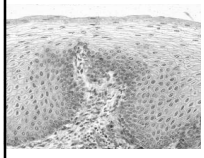
Organ: Structure composed of two or more tissue types that function together (e.g. skin)

Organ System: Two or more organs that work together to perform a specific function (e.g. digestive system)

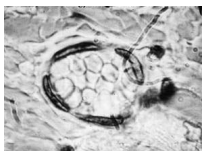
Tissue Types:

(a.k.a. Covering)

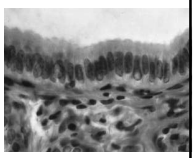
1) Epithelial Tissue: Cover body surface / line body cavity
   - Tissue structure adapted to function:



Impermeable Barrier
Skin



Permeable Barrier
Blood vessel



Self-cleaning Barrier
Lung

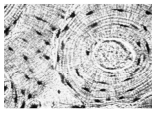
   - Some epithelial tissues form glands (exocrine vs. endocrine)
   - Tissue continually lost and replaced (mitosis)

Chapter 26: Homeostasis/Organization of the Animal Body

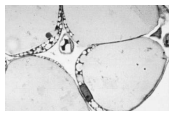
Tissue Types:

2) Connective Tissue: Sheet of cells that support and bind other tissues (a.k.a. Support)
   - Consist of cells w/ large quantities of extracellular material
     - Contains collagen / elastic fibers

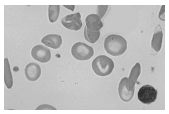
Types of Connective Tissue:



Bone:
Support



Adipose:
Energy Storage; Insulation



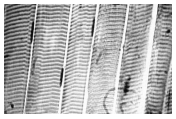
Blood:
Transport; Protection

Chapter 26: Homeostasis/Organization of the Animal Body

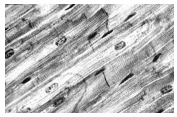
Tissue Types:

3) Muscle Tissue: Sheet of cells that can contract when properly stimulated (a.k.a. Movement)

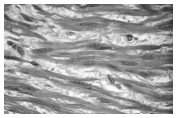
Types of Muscle Tissue:



Skeletal Muscle
Moves skeleton; Voluntary control



Cardiac Muscle
Pumps heart; Involuntary control

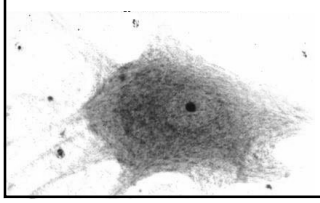


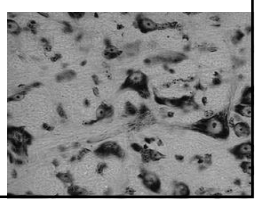
Smooth Muscle
Propels substances; Involuntary control

Chapter 26: Homeostasis/Organization of the Animal Body

Tissue Types:

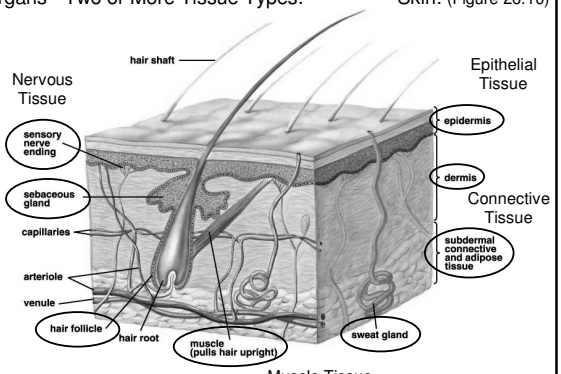
4) Nervous Tissue: Cells that are capable of transmitting electrical impulses (a.k.a. Control)
   - Compose brain, spinal cord, peripheral nerves
   - Consist of two cell types:
     A) Neurons: Generate and conduct electrical impulse
     B) Glial Cells: Support and protect neurons





Chapter 26: Homeostasis/Organization of the Animal Body

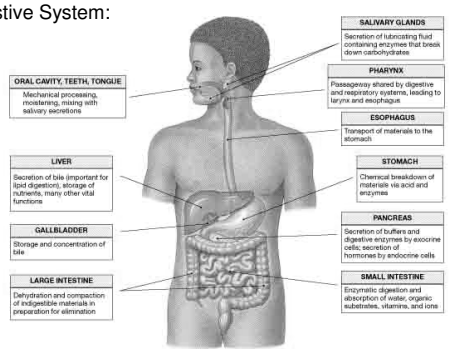
Organs - Two or More Tissue Types: Skin: (Figure 26.10)



Chapter 26: Homeostasis/Organization of the Animal Body

Organ Systems - Two or More Organs Working Together:

Digestive System:



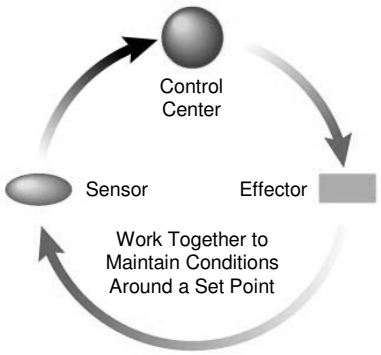
Chapter 26: Homeostasis/Organization of the Animal Body

For life to continue, precise internal body conditions must be maintained regardless of external conditions

Homeostasis: The process of maintaining a relatively stable internal environment

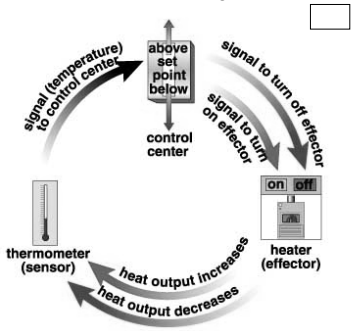
- Not a static process (Dynamic Equilibrium)
- Conditions maintained via feedback systems

Parts of a Feedback System:



Types of Feedback Systems:

1) Negative Feedback System:
   - Effector counteracts the change detected



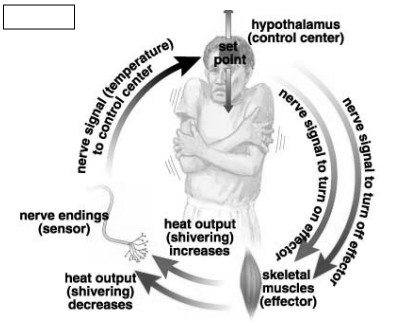
(Figure 26.1)

Types of Feedback Systems:

1) Negative Feedback System:

Most Common System in Body

   - Effector counteracts the change detected

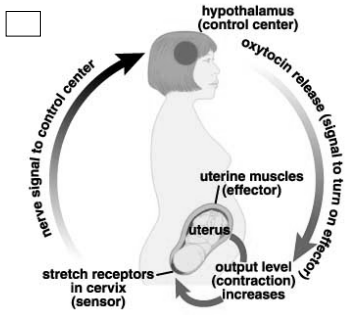


(Figure 26.1)

Types of Feedback Systems:

- Nuclear Reaction
- Population Growth

1) Positive Feedback System:
   - Effector responds to intensify the original change



(Figure 26.1)

Chapter 26: Homeostasis/Organization of the Animal Body

For life to continue, precise internal body conditions must be maintained regardless of external conditions

Homeostasis: The process of maintaining a relatively stable internal environment

Organ Systems Work Together to Maintain Homeostasis:

- Communication Systems:
  1) Nervous System
     - Electrical communication via nerve/muscle tissue
     - Fast; Short duration
  2) Endocrine System
     - Chemical communication via bloodstream
     - Slow; Long duration