

Chapter 32 Homeostasis and Endocrine Signaling

☞ **Anatomy:** biological form ☞ **physiology:** biological function ☞

32.1 Feedback control maintains the internal environment in many animals

☞ Animal bodies are based on hierarchy of cells, **tissues**, **organs**, and **organ systems**.

Epithelial tissue forms active interfaces on external and internal surfaces; **connective tissue** binds and supports other tissues; **muscle tissue** contracts, moving body parts; and **nervous tissue** transmits nerve impulses throughout the body. ☞

☞ **Tissues:** groups of cells with a similar appearance and a common function ☞
organs: different types of tissues further organized into functional units ☞ **organ system:**
Groups of organs that work together provide an additional level of organization and coordination ☞

☞ **Epithelial tissue:** sheets of closely packed cells that cover the outside of the body, lines organs and cavities ☞ **epithelium:** lines the intestines, secretes digestive juices and absorbs nutrients ☞

☞ **Nervous tissue:** functions in the receipt, processing, and transmission of information
☞ **Neurons:** the basic units of the nervous system – a neuron receives nerve impulses from other neurons via its cell body and multiple extensions called dendrites – they transmit impulses to nerves, muscles or other cells via axons ☞ **glial cells (glaia):** support cells in nervous tissue – various types of glia help nourish, insulate, and cell nourish neurons and in some cases modulate neuron function ☞

☞ **Muscle tissue:** consist of filaments containing actin, myosin, enabling muscles to contract ☞ **skeletal muscle:** responsible for voluntary movement ☞ **smooth muscle:** found in the wall of many internal organs ☞ **cardiac muscle:** forms the contractile wall of the heart ☞

☞ **Connective Tissue:** consists of cells scattered through an extracellular matrix ☞

☞ Animals regulate certain internal variables while allowing other internal variables to conform to external changes. **Homeostasis** is the maintenance of steady state despite internal and external changes ☞

☞ **Regulator:** an animal that uses internal mechanisms to control internal change in the face of external fluctuation ☞ **Conformer:** an animal that allows its internal condition to change in accordance with external changes. ☞ **Interstitial Fluid:** fluid that surrounds body cells ☞ **Homeostasis:** “steady state” refers to maintenance of internal balance ☞ Fluctuations in the variable above or below the set point (ideal body conditions) serve as a stimulus detected by sensors → upon receiving a signal from the sensor, the hypothalamus generates an output that triggers a response ☞ **negative feedback:** a control mechanism that reduces the stimulus ☞

☞ An animal maintains its internal temperature within a tolerable range by **thermoregulation**. **Endotherms** are warmed mostly by heat generated by metabolism. **Ectotherms** get most of their heat from external sources. The **hypothalamus** acts as the thermostat in mammalian regulation of body temperature. ☞