

Chapter 45 Hormones and the Endocrine System

What you should know

1. Explain the two key ways that hormones affect target organs
2. Explain 3 examples of the secretion, target, action, and regulation of at least three hormones
3. Use both a positive and negative feed back example of regulation of homeostasis by a hormone

Overview: The Body's Long-Distance Regulators

- Animal **hormones** are chemical signals that are secreted into the circulatory system and communicate regulatory messages within the body
- Hormones reach all parts of the body, but only target cells are equipped to respond
- Insect metamorphosis is regulated by hormones
- Two systems coordinate communication throughout the body: the endocrine system and the nervous system
- The **endocrine system** secretes hormones that coordinate slower but longer-acting responses including reproduction, development, energy metabolism, growth, and behavior
- The **nervous system** conveys high-speed electrical signals along specialized cells called neurons; these signals regulate other cells

Concept 45.1: Hormones and other signaling molecules bind to target receptors, triggering specific response pathways

- Chemical signals bind to receptor proteins on target cells
- Only target cells respond to the signal

Types of Secreted Signaling Molecules

- Secreted chemical signals include
 - Hormones
 - Local regulators
 - Neurotransmitters
 - Neurohormones
 - Pheromones

Hormones

- Endocrine signals (hormones) are secreted into extracellular fluids and travel via the bloodstream
- Endocrine glands** are ductless and secrete hormones directly into surrounding fluid
- Hormones mediate responses to environmental stimuli and regulate growth, development, and reproduction
- Exocrine glands have ducts and secrete substances onto body surfaces or into body cavities (for example, tear ducts)

Local Regulators

- Local regulators** are chemical signals that travel over short distances by diffusion
- Local regulators help regulate blood pressure, nervous system function, and reproduction
- Local regulators are divided into two types
 - Paracrine** signals act on cells near the secreting cell
 - Autocrine** signals act on the secreting cell itself