A.P. Biology **Name** _____

Campbell – The Endocrine System – Page 974 - 980

Are We 'Posed To Read The Overview?

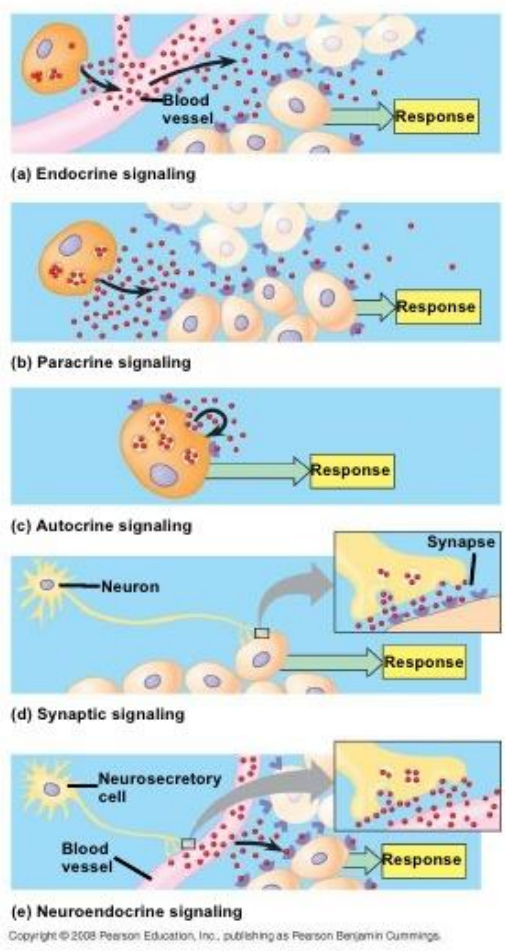
_____ A substance produced by the body to initiate change in another part of the body is called a(n) _____.
_____ Hormones are usually dispersed from a gland to a target by the _____ system.
_____ Cells in the body that are sensitive to hormonal signals are called _____ cells.
_____ The chief role of the endocrine is to aid the body in maintaining a constant internal state known as _____.

Nervous System (N) – Endocrine System (E) Matching

_____ Reflex
_____ Signals are delivered with speed and efficiency.
_____ Signals are electrochemical in nature.
_____ Signal transference involves markers and receptors.
_____ The relayed "information" is maintained over a period of hours, days, or even weeks.

Section 45.1 Hormones & Other Signaling Molecules Bind to Receptors, Triggering Specific Response Pathways

Intercellular Communication



Endocrine signaling involves h_____ secreted into extracellular fluid and transported by the b_____ to help an organism maintain h_____, mediate response to e_____ and regulate g_____ and development.

Many cells secrete local regulators that travel _____ (*short / long)* distances to reach target cells by d_____. Cytokines involved in the i_____ system are an example. Cells can do local signaling in two ways. In p_____ signaling target cells are n_____ the secreting cell. In a_____ signaling the target cell is the s_____ cell. This method plays a role in b_____ pressure regulation, n_____ system function and r_____.

Secreted molecules are necessary for two types of neuron signaling. S_____ signaling involves a synapse and neurons release n_____ that travel across the synapse to bind to receptors on the t_____ cells. These are central to s_____, m_____, c_____ and m_____. In neuroendocrine signaling n_____ cells secrete molecules that diffuse into the b_____. These molecules are known as n_____ and antidiuretic hormone is an example.

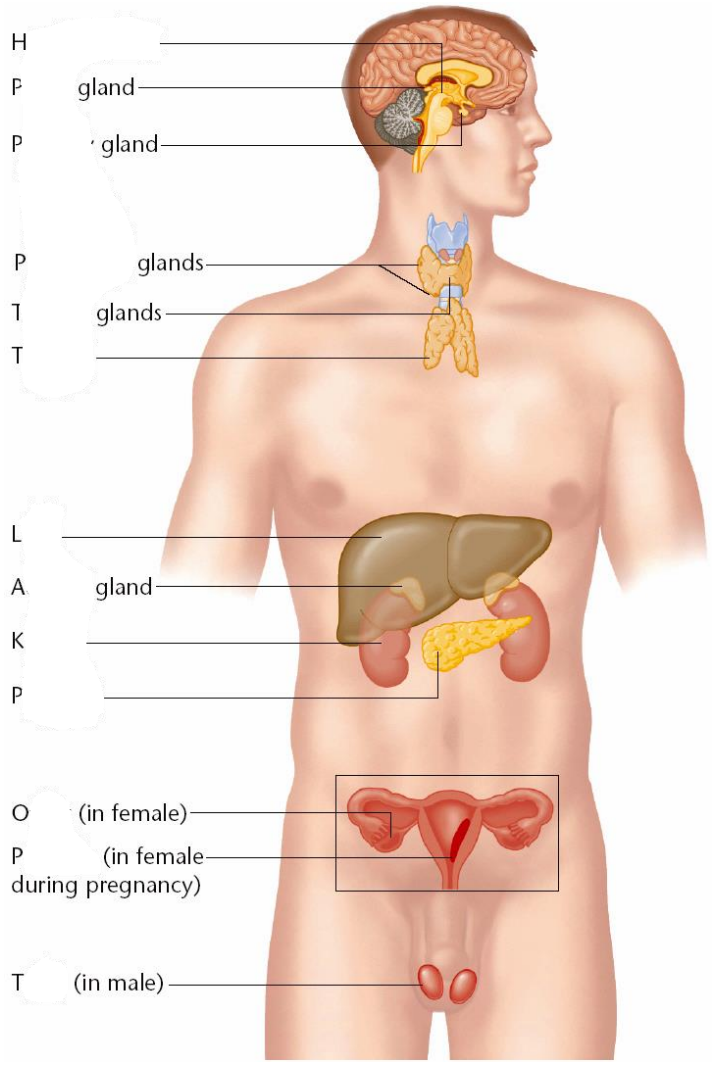
Pheromones are secreted molecules released to the external e_____. Ants use pheromones to m_____ their path to a food source or guidance for m_____. Other uses include defining t_____, warning of p_____ and attracting potential m_____.

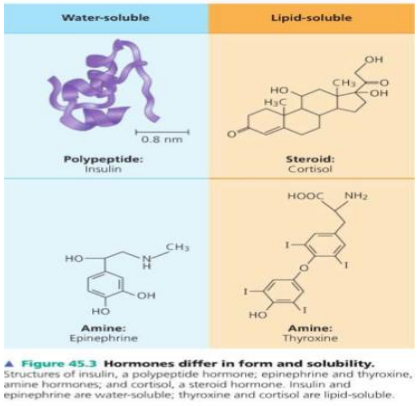
Endocrine Tissues and Organs

Endocrine system organs are found _____ (*separate from / in)* other organs. They secrete hormones directly into the surrounding fluid and _____ (*do / do not)* use ducts.

Identify the organs found in the Human Endocrine (Hormonal) System in the diagram below:

A. _____
B. _____
C. _____
D. _____
E. _____
F. _____
G. _____
H. _____
I. _____
J. _____
K. _____
L. _____
M. _____





▲ Figure 45.3 Hormones differ in form and solubility. Structures of insulin, a polypeptide hormone; epinephrine and thyroxine, amine hormones; and cortisol, a steroid hormone. Insulin and epinephrine are water-soluble; thyroxine and cortisol are lipid-soluble.

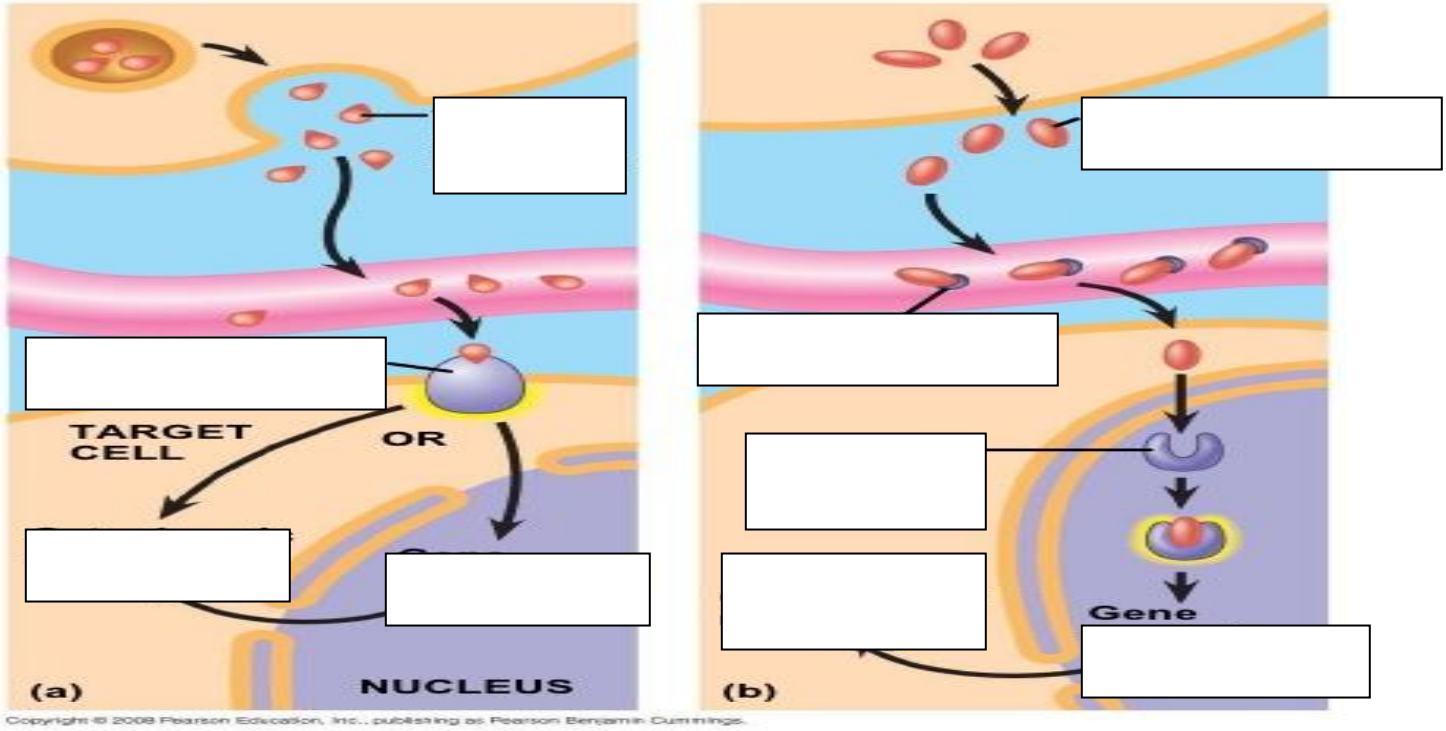
Chemical Classes of Hormones

The three major classes of hormones are p_____, s_____ and a_____. They vary in their s_____ in aqueous and lipid-rich environments. Polypeptides and amines are _____ soluble and therefore cannot pass through the p_____m_____ and require cell-surface receptors. Steroid hormones are _____ soluble and can pass through the plasma membrane, therefore receptors are found in the c_____.

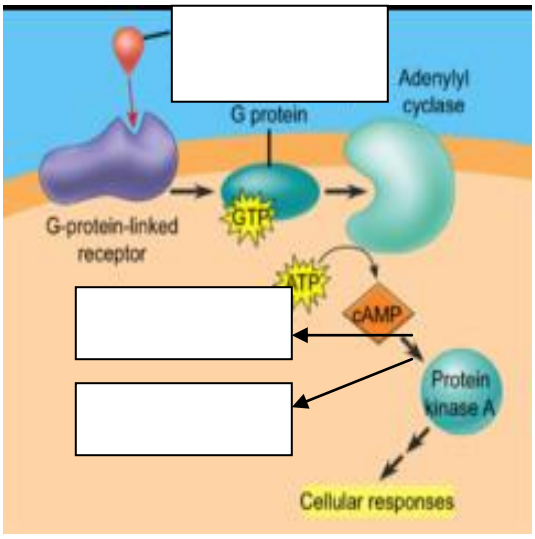
Cellular Response Pathways

The location of the signal receptor will vary depending on if the hormone is l_____ soluble or w_____ soluble. Water soluble hormones are secreted by exocytosis and travel freely in b_____ and bind to c_____ signal receptors. Lipid soluble hormones must bind to transport p_____ to keep them soluble in the bloodstream and are able to d_____ across the plasma membrane into the target cell and bind to i_____ signal receptors.

Label the diagram below indicating which is a receptor inside the cell or in the plasma membrane and the missing labels in the diagram.



Receptor in _____ Receptor in _____



The response from a water soluble hormone may be the activation of an e_____, a change in the uptake or secretion of s_____ m_____, or a rearrangement of the c_____ and some even cause proteins to move from the c_____ to the nucleus to alter t_____ of genes. The changes necessary to go from the hormone signal to the response are known as a s_____ t_____ p_____.

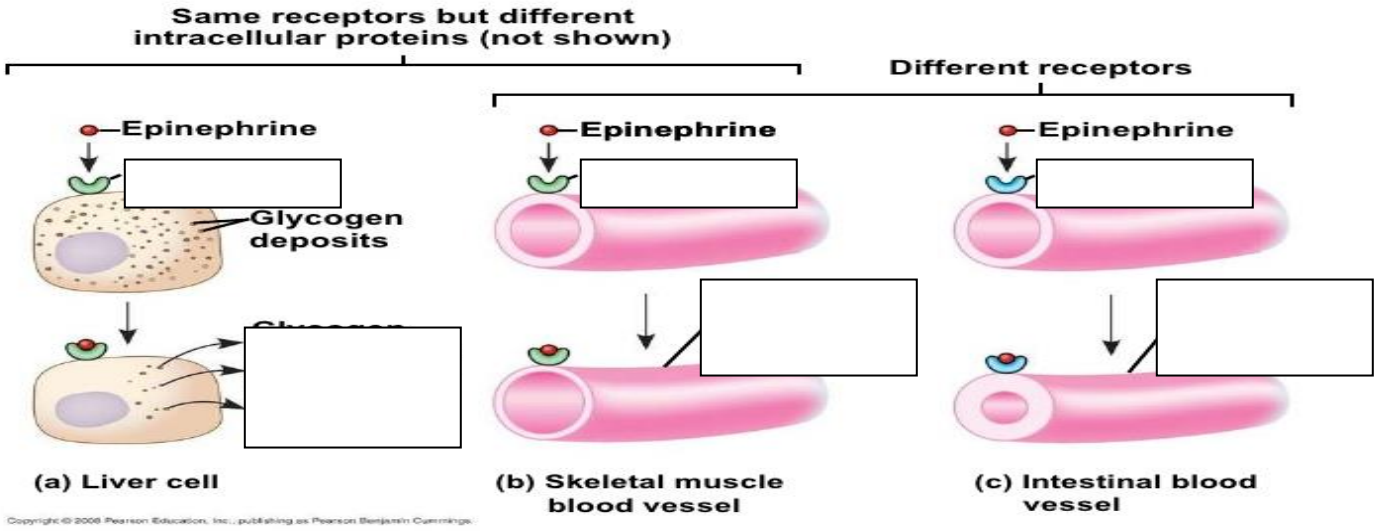
A hormone involved in the response to short term stress, like running to not be late to class, is e_____ / a_____. It involves a _____ protein in target cells in the l_____ and _____ as a second messenger that activates p_____ k_____ to activate an enzyme to breakdown g_____. The net response of epinephrine release by the liver is the release of glucose into the bloodstream to be used as f_____.

Label the specific cellular responses and the signal molecule in the diagram above using figure 45.7 as a guide.

In most cases a response to a lipid soluble hormone is a change in g_____ expression. S_____ hormones bind to a cytosolic receptor and form a hormone-receptor complex that moves into the n_____, alters t_____ by interacting with DNA binding protein or response element in the DNA. E_____ is an example in females. Non steroid lipid soluble hormones have receptors located in the n_____ and stimulate t_____ of specific genes.

Multiple Effects of Hormones

Hormones can cause _____(*only one / multiple)* type(s) of responses. This occurs if the target cells differ in the m_____ that receive or produce the response. For example epinephrine triggers the breakdown of g_____ in the liver, i_____ blood flow to major skeletal muscles and d_____ blood flow to the digestive tract which all increase rapid reactions in an emergency. Tissues respond differently because they vary in the r_____ or the s_____ t_____ p_____. There are two types of epinephrine receptors _____ and _____. Beta are found in the l_____ and s_____ muscle recptors while the alpha is found in the i_____ blood vessels. So even with the same receptor the response can differ in different target cells. **Fill in the missing information in the diagram below.**

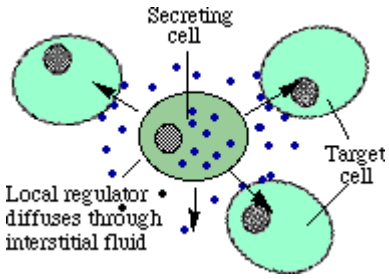


Signaling by Local Regulators

Local regulators function in p_____ signaling (neighboring cells) and a_____ signaling (regulate secreting cell). Local regulators are _____ (*faster / slower)* than hormones and the pathways are the _____ (*different / slower)*. Several types of local regulators are known. Match the three below to the correct descriptions for each.

Local Regulators

A. Growth factors
B. Nitric oxide
C. Prostaglandins



Responses to Local Regulators

_____ Stimulate cell proliferation
_____ Cells divide and develop normally when this is present
_____ Also functions as a neurotransmitter
_____ Released when oxygen levels are low
_____ Activates an enzyme that relaxes smooth muscle causing vasodilation
_____ Plays a part in male sexual function
_____ Modified fatty acids
_____ Cause uterine walls to contract to assist in fertilization
_____ Helps to induce labor
_____ Promote fever and inflammation
_____ Synthesis inhibited by aspirin
_____ Pathway slowed by Viagra
_____ Regulates aggregation of platelets
_____ Helps maintain the protective lining of the stomach

Coordination of Neuroendocrine and Endocrine Signaling

In _____ organisms except the simples invertebrates the endocrine and nervous systems act together to control r_____ and d_____. An example is the life cycle of a butterfly. To grow a larva must m_____ and this is directed by signal from the b_____. The same hormone, ecdysteroid, regulates both molting and metamorphosis. Whether the butterfly molts of metamorphs is determined by j_____ hormone released from a different endocrine gland. If juvenile hormone is _____ *(high / low)* ecdysteroid stimulates molting but when juvenile hormone is _____*(high / low)* it stimulates metamorphosis. This knowledge can be helpful in agriculture for p_____ control.

Fill in the missing information in the diagram below.