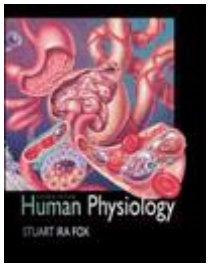
Human Physiology, 7/e
Stuart I Fox, Pierce College



Endocrine Glands: Secretion and Action of Hormones

Results Reporter

Out of 56 questions, you answered 31 correctly, for a final grade of 55%.

31 correct (55%)
25 incorrect (45%)
0 unanswered (0%)

Please answer all questions

Your Results:

The correct answer for each question is indicated by a ✓.

1 CORRECT

A list of endocrine glands should include the heart, liver, hypothalamus, and kidneys since these organs all secrete hormones that affect target cells around the body. (p. 286)

✓ **A)** True
B) False

Feedback: Correct: While originally not considered to be endocrine glands the heart, liver and kidneys have all been shown, like the hypothalamus, to synthesize and secrete hormones. (p. 286)

2 CORRECT

Although these hormones are not steroids, T_3 and T_4 are small and nonpolar; and thus can be taken orally without being inactivated by enzymes in the digestive tract. (p. 289)

✓ **A)** True
B) False

Feedback: Correct: These hormones are not proteins or peptides and will not be digested and can be ingested. (p. 289)

3 INCORRECT

In most respects the actions of neurotransmitters and hormones on their target cells are distinctly different. (p. 290)

A) True
✓ **B)** False

Feedback: Incorrect: Neurotransmitters and many polypeptide hormones bind to receptors on the surface of the cell and initiate events in the cell through similar if not identical mechanisms. (p. 290)

4 CORRECT

The same molecule can be found serving as a neurotransmitter in one part of the body and as a hormone in another part of the body. (p. 290)

✓ **A)** True
B) False

Feedback: Correct: When released from a nerve cell the chemical would be a neurotransmitter, but when released into the blood by an endocrine gland the same chemical would be a hormone. (p. 290)

5 **CORRECT**

Secreted hormones generally do not remain in the bloodstream and accumulate since they are rapidly removed by the liver or the target organs themselves. (p. 291)

✓ **A)** True

B) False

Feedback: Correct: Each hormone has a specific half-life that relates to the rate at which the hormone is removed from the blood. (p. 291)

6 **CORRECT**

To help excrete "old'' steroid hormones in urine and bile, the liver converts them into more polar water-soluble metabolites. (p. 291)

✓ **A)** True

B) False

Feedback: Correct: Steroid hormones are hydrophobic and must be made hydrophilic to be excreted from the body. (p. 291)

7 **INCORRECT**

A "physiological'" dose refers to an abnormally high concentration of a substance--more than is normally present in the bloodstream. (p. 291)

A) True

✓ **B)** False

Feedback: Incorrect: A "physiological" dose of a hormone provides a normal concentration of the hormone. (p. 291)

8 **CORRECT**

A pharmacological dose of the sex steroids is present in contraceptive pills. (p. 291)

✓ **A)** True

B) False

Feedback: Correct: the pharmacological doses of estrogens and progesterone serve to block ovulation. (p. 291)

9 **INCORRECT**

The priming effect of hormones may actually decrease the number of receptor proteins in their target cells, causing downregulation. (p. 291)

A) True

✓ **B)** False

Feedback: Incorrect: The priming effect of hormones usually increases the receptor numbers in target cells. (p. 291)

10 **CORRECT**

To prevent desensitization of receptors from occurring under normal circumstances, many polypeptide and glycoprotein hormones are secreted in a pulsatile fashion, rather than being secreted continuously. (p. 291)

✓ **A)** True

B) False

Feedback: Correct: Pulsatile secretion allows for the hormone to be released sporadically, preventing desensitization. (p. 291)

11 **CORRECT**

Hormones are delivered by the blood to every cell in the body, but only the target cells with specific receptor proteins for that hormone are able to respond. (p. 292)

✓ **A)** True

B) False

Feedback: Correct: Since the blood transports all compounds that are present, the cells must be able to regulate their responsiveness by the presence or absence of specific receptors for the hormone. (p. 292)

12 **INCORRECT**

Hormones bind to receptor proteins with high capacity and low affinity. (p. 292)

A) True

✓ ○ **B)** False

Feedback: The receptors have a high affinity and low capacity for specific hormones. (p. 292)

13 **INCORRECT**

Because they are polar and thus water-soluble, steroid and thyroid hormones are transported in the bloodstream bound to plasma carrier proteins. (p. 292)

◉ **A)** True

✓ ○ **B)** False

Feedback: Incorrect: Steroid hormones are transported in the blood bound to carrier proteins because these hormones are non-polar. (p. 292)

14 **CORRECT**

Steroid hormones attach to cytoplasmic receptor proteins of target cells that translocate to the nucleus to direct the production of specific new proteins through genetic transcription and translation. (p. 292)

✓ ◉ **A)** True

○ **B)** False

Feedback: Correct: Once the steroid hormone diffuses into the cell and binds to the receptor in the cytoplasm this complex enters the nucleus and regulates the expression of specific genes. (p. 292)

15 **CORRECT**

Cyclic AMP activates previously inactive protein kinase enzymes to modulate the activity of other inactive enzymes already present in the target cell. (p. 295)

✓ ◉ **A)** True

○ **B)** False

Feedback: Correct: Cyclic AMP is produced by the actions of adenylate cyclase and then activates protein kinases which phosphorylate proteins in the cell. (p. 295)

16 **CORRECT**

Caffeine (in coffee) and theophylline (in tea) act as phosphodiesterase inhibitors that produce their effects such as relaxing the smooth muscle fibers of the respiratory bronchioles by causing a rise in the cAMP concentrations within target tissue cells. (p. 296)

✓ ◉ **A)** True

○ **B)** False

Feedback: Correct: By blocking the actions of phosphodiesterase in the target cell the cAMP that is produced remains in the cell, prolonging the effects that were initiated by the hormones or neurotransmitters. (p. 296)

17 **CORRECT**

The regulatory molecule nitric oxide (NO) helps to relax the smooth muscle of blood vessels causing vasodilation by activating the second messenger, cyclic guanosine monophosphate (cGMP). (p. 296)

✓ ◉ **A)** True

○ **B)** False

Feedback: Correct: NO production lead to the activation of guanylate cyclase the produces cGMP that acts in a manner similar to cAMP. (p. 296)

18 **INCORRECT**

Calcium ions (Ca^{2+}) inside the cell may act as second messengers where very high intracellular concentrations of Ca^{2+} are maintained by active transport membrane pumps. (p. 297)

◉ **A)** True

✓ ○ **B)** False

Feedback: Incorrect: The high intracellular concentrations of Ca^{2+} are due to the release of Ca^{2+} from the endoplasmic reticulum. (p. 297)

19 **INCORRECT**

Stimulation of the α-adrenergic receptors by epinephrine results in activation of adenylate cyclase and the production of cAMP; whereas stimulation of β-adrenergic receptors activate the Ca^{2+} second-messenger system. (p. 297)

A) True

✓ **B)** False

Feedback: Incorrect: The α-adrenergic receptors activate the Ca^{2+} second-messenger system and the β-adrenergic receptors use cAMP as a second messenger. (p. 297)

20 **CORRECT**

Two different hormones can act on the same target cell and produce different result with one activating cAMP production and the other activating the phospholipase C-IP_3-Ca^{2+}-calmodulin system. (p. 297)

✓ **A)** True

B) False

Feedback: Correct: Epinephrine can produce the same effect in liver cells by using both of these second messenger systems. (p. 297)

21 **INCORRECT**

The anterior pituitary develops as a down growth of the brain, while the posterior pituitary is derived from embryonic epithelium from Rathke's pouch. (p. 299)

A) True

✓ **B)** False

Feedback: Incorrect: The anterior pituitary develops from Rathke's pouch which is derived from the embryonic mouth and the posterior pituitary is derived from a down growth of the brain. (p. 299)

22 **CORRECT**

The term often added as a suffix to the name of hormones such as those from the anterior pituitary is trophic which means "food," often shortened to tropic which means "attracted to."(p. 300)

✓ **A)** True

B) False

Feedback: Correct: These suffixes are used to demonstrate the supportive role of these hormones on their target organs. (p. 300)

23 **INCORRECT**

The pars nervosa of the pituitary gland is poorly understood, producing different forms of melanocyte-stimulating-hormone (MSH) and large amounts of β-endorphin. (p. 284)

A) TRUE

✓ **B)** FALSE

Feedback: Incorrect: The pars nervosa releases oxytocin and ADH. (p. 301)

24 **INCORRECT**

The axons of the hypothalamo-hypophyseal tract join the hypothalamus to the anterior pituitary. (p. 301)

A) True

✓ **B)** False

Feedback: Incorrect: The anterior pituitary is not physically joined to the hypothalamus. (p. 301)

25 **INCORRECT**

The anterior lobe of the pituitary is more a storage organ for hormones than a true gland. (p.300)

A) True

✓ **B)** False

Feedback: Incorrect: The anterior pituitary gland synthesizes and secretes many trophic hormones. (p. 300)

26 **CORRECT**

If any tissue deserves the title, the hypothalamus rather than the anterior pituitary should be considered the true "master gland'' in the body. (p. 301)

✓ **A)** True

B) False

Feedback: Correct: The hypothalamus regulates the secretion of hormones from the anterior pituitary. (p. 301)

27 **CORRECT**

The vascular link between the hypothalamus and the anterior pituitary is called the hypothalmo-hypophyseal portal system, transporting releasing and inhibiting hormones of the hypothalamus toward specific target cells in the adenohypophysis. (p. 303)

✓ **A)** True

B) False

Feedback: Correct: The hypothalamo-hypophyseal portal system takes hormones released by the hypothalamus and transports them to the anterior pituitary gland. (p. 303)

28 **CORRECT**

Anterior pituitary secretion of ACTH, TSH, and the gonadotropins (FSH and LH) is controlled by negative feedback loops from hormones produced by target cells. (p. 304)

✓ **A)** True

B) False

Feedback: Correct: The increase of the hormones from the target organ decreases the release of the trophic hormone from the anterior pituitary gland. (p. 304)

29 **CORRECT**

During the menstrual cycle, rising levels of estradiol cause a temporary "surge" in the blood levels of LH that results in ovulation of an ovum from the graafian follicle - an example of positive feedback control of target gland secretion. (p. 305)

✓ **A)** True

B) False

Feedback: Correct: Normally, the high concentration of estradiol would decrease LH secretion, however the rapid increase in estradiol stimulates LH secretion. (p. 305)

30 **INCORRECT**

The synchronization of female menstrual cycles (the "dormitory effect") and circadian rhythms ("about a day") are good examples of the influence of higher brain centers on the anterior pituitary-adrenal gland interaction, or axis. (p. 305)

A) True

✓ **B)** False

Feedback: Incorrect: While circadian rhythms demonstrate the interactions of higher brain centers, the "dormitory effect" is an example of pheromones acting on the anterior pituitary-ovarian interaction. (p. 305)

31 **INCORRECT**

The adrenal medulla is derived from embryonic mesoderm, whereas the adrenal cortex is derived from embryonic neural (ectoderm) tissue. (p. 305)

A) True

✓ **B)** False

Feedback: Incorrect: The adrenal medulla is derived from ectoderm and the adrenal cortex is derived from mesoderm. (p. 305)

32 **CORRECT**

When individuals are under stressful conditions, there is increased secretion of ACTH and, thus, increased secretion of adrenal corticosteroids. (p. 308)

✓ **A)** True

B) False

Feedback: Correct: Interactions of higher brain centers cause an increase in ACTH secretion when an individual is under stress which increases the secretion of corticosteroids. (p. 308)

33 **CORRECT**

Many pleasant life changes such as marriage, graduation, or job promotion can be forms of "stress", thereby activating the pituitary-adrenal axis and causing an increase in the secretions of ACTH and corticosteroid hormones. (p. 308)

✓ **A)** True

B) False

Feedback: Correct: Any change from normal may be perceived by the higher brain centers as stress, initiating the stress response. (p. 308)

34 **CORRECT**

Hormones secreted from the adrenal medulla are expected to increase cardiac rate and cardiac output, respiratory rate, and other major functions. (p. 307)

✓ **A)** True

B) False

Feedback: Correct: The catecholamines from the adrenal medulla would stimulate the same effects as sympathetic nerves. (p. 307)

35 **INCORRECT**

Pheochromocytoma is a tumor of the adrenal cortex, releasing large quantities of epinephrine and norepinephrine. (p. 307)

A) True

✓ **B)** False

Feedback: Incorrect: A pheochcomocytoma is a tumor of the adrenal medulla, not the adrenal cortex. (p. 307)

36 **INCORRECT**

The thyroid gland is the only gland in the body that expends metabolic energy in the active transport of iron atoms from the blood and into the colloid of the thyroid follicles. (p. 308)

A) True

✓ **B)** False

Feedback: Incorrect: The thyroid gland transports iodide, not iron atoms form the blood and into the colloid. (p. 308)

37 **CORRECT**

Basal metabolic rate (BMR) can be defined as the minimum number of calories burned or expended by the body just to stay alive (without activity). (p. 309)

✓ **A)** True

B) False

Feedback: Correct: The BMR is the resting calorie expenditure of the body. (p. 309)

38 **INCORRECT**

Undersecretion of thyroxine (hypothyroidism) in infants results in myxedema, whereas hypothyroidism in adults causes cretinism. (p. 312)

A) True

✓ **B)** False

Feedback: Incorrect: Hypothyroidism in infants causes cretinism and in adults it causes myxedema. (p. 312)

39 **CORRECT**

Graves' disease, or toxic goiter, is an autoimmune disease in which antibodies are made that act like TSH and abnormally stimulate the thyroid gland. (p. 311)

✓ **A)** True

B) False

Feedback: Correct: The antibodies cause an increase in thyroid hormone secretion, producing hyperthyroidism. (p. 311)

40 **CORRECT**

Between the follicles of the thyroid gland are epithelial cells called parafollicular cells that secrete the hormone known as calcitonin (or thyrocalcitonin). (p. 309)

✓ **A)** True

B) False

Feedback: Correct: Calcitonin is the other thyroid hormone, but is not secreted from the follicle like T3 and T4. (p. 309)

41 **INCORRECT**

When most of the patient's thyroid gland is surgically removed, the blood levels of thyroxine drop rapidly since it has an extremely short half-life. (p. 291)

◉ **A)** True

✓ ○ **B)** False

Feedback: Incorrect: Thyroid hormones have a relatively long half-life so the decrease in blood levels of thyroxine would decrease gradually.(p. 291)

42 **INCORRECT**

The major action of parathyroid hormone (PTH) is to control the iodine levels of the blood and thereby control the secretion of thyroxine from the thyroid glands. (p. 312)

◉ **A)** True

✓ ○ **B)** False

Feedback: Incorrect: PTH regulates the concentration of Ca2+ in the blood and has no effect on thyroxine secretion. (p. 312)

43 **CORRECT**

The secretion of hormones makes the pancreas endocrine, and the secretion of pancreatic "juice" into the digestive system makes the pancreas also exocrine. (p. 313)

✓ ◉ **A)** True

○ **B)** False

Feedback: Correct: The pancreas is a mixed gland since it has both endocrine and exocrine functions. (p. 313)

44 **CORRECT**

Glucagon is a hormone that is active when an individual is fasting or starving, stimulating the hydrolysis of stored fat (lipolysis) and liver glycogen (glycogenolysis) so that fuel levels will rise in the blood, providing energy to the cells. (p. 313)

✓ ◉ **A)** True

○ **B)** False

Feedback: Correct: Glucagon is secreted when blood glucose concentrations are low and increased the energy substrates in the blood. (p. 313

45 **INCORRECT**

After a meal, glucagon secretion is decreased and insulin secretion is increased - an example of the antagonistic action of hormones. (p. 313)

◉ **A)** True

✓ ○ **B)** False

Feedback: Incorrect: The regulation of glucagons and insulin secretion is due to changes in blood glucose concentrations. (p. 313)

46 **INCORRECT**

The pineal gland is both an endocrine and an exocrine gland. (p. 314)

◉ **A)** True

✓ ○ **B)** False

Feedback: Incorrect: The pineal gland is only an endocrine gland. (p. 314)

47 **CORRECT**

After the age of seven, the pineal gland begins to shrink and in an adult appears as a thickened strand of fibrous tissue. (p. 314)

✓ ◉ **A)** True

○ **B)** False

Feedback: Correct: The pineal secretes decreasing amounts of melatonin and the gland looses cell numbers. (p. 314)

48 **CORRECT**

The pineal gland and the release of its principal hormone, melatonin, is controlled by sympathetic neurons projecting from the hypothalamus. (p. 314)

✓ ◉ **A)** True

○ **B)** False

Feedback: Correct: The hypothalamus regulates melatonin secretion based on light-dark cycles through input to the pineal gland. (p. 314)

49 **CORRECT**

The hormone melatonin has been implicated in many physiological processes such as jet lag and seasonal affective disorder (SAD) or "winter depression." (p. 314)

✓ ◉ **A)** True

○ **B)** False

Feedback: Correct: The changes in melatonin have been related to various circadian processes such as jet lag and SAD. (p. 314)

50 **INCORRECT**

The thymus gland secretes the hormone, melatonin, that may have a role in maturation of gonads in some species and the onset of puberty in humans. (p. 315)

◉ **A)** True

✓ ○ **B)** False

Feedback: Incorrect: The pineal gland secretes melatonin, which may regulate gonad maturation. (p. 314)

51 **INCORRECT**

The thymus serves as the site for production of B-type lymphocytes (B cells) that are involved in cell-mediated immunity. (p. 315)

◉ **A)** True

✓ ○ **B)** False

Feedback: Incorrect: The thymus is the site for T cell maturation. (p. 315)

52 **CORRECT**

Both the stomach and small intestine secrete a number of hormones that act locally and on tissues of the pancreas and gallbladder. (p. 315)

✓ ◉ **A)** True

○ **B)** False

Feedback: Correct: The hormones secreted by the gastrointestinal tract have been shown to act on local tissues and other tissues associated with digestive function. (p. 315)

53 **INCORRECT**

Human chorionic gonadotropin is a hormone secreted by the placenta that is similar in its action to both growth hormone and prolactin. (p. 316)

◉ **A)** True

✓ ○ **B)** False

Feedback: Incorrect: Somatomammotropin has effects of both GH and prolactin. (p. 316)

54 **INCORRECT**

In males, the interstitial tissues produce sperm and the seminiferous tubules secrete testosterone. (p. 316)

◉ **A)** True

✓ ○ **B)** False

Feedback: Incorrect: The interstitial cells produce testosterone and the seminiferous tubules produce sperm. (p. 316)

55 **CORRECT**

Neurotransmitters can no longer be distinguished from hormones by their chemical structures; they must, instead, be separated by their actions, or functions. (p. 317)

✓ ◉ **A)** True

○ **B)** False

Feedback: Correct: Catecholamines can be both neurotransmitters and hormones depending upon the secretion site. (p. 317)

56 **INCORRECT** Paracrine regulators can be defined as regulatory molecules that are produced by a given tissue of an organ and then act within the same tissue of that organ. (p. 317)

- (●) **A)** True
- ( ) **B)** False

Feedback: Incorrect: Paracrine regulators act on cells near the site of secretion, not the cell that secretes the chemical. (p. 317)

Routing Information

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