human anatomy & physiology
sampler questions

Please note that there are questions within this set that test material that may not have been covered in your lecture; unless otherwise specified, lecture examinations will only include material covered within lecture. You should attempt to answer all the questions before resorting to the answer key.

**Endocrinology**

16-01. In circumstances where the body requires prolonged or increased levels of a hormone, the DNA of target cells will specify the synthesis of more receptors on the surface of the cells of the target organ. This is known as

a. the cell's sensitivity reaction  
b. cellular affinity  
c. up-regulation  
d. a reaction to a stressor

16-02. Although we speak of the pituitary releasing factors produced by hypothalamic neurons as hormones, they would better be classified as

a. paracines  
b. neurohormones  
c. neurotransmitters

16-03. Catecholamines and peptide hormones bind to receptors on the surface of cells that comprise the target organs. This binding causes

a. an immediate change in genetic activity  
b. the opening of a sodium channel  
c. the activation of a potassium channel  
d. adenylate cyclase to generate cyclic AMP from ATP

16-04. During pregnancy, progesterone produced by the placenta has what role to play with respect to estrogen?

a. permissive  
b. synergistic  
c. antagonistic

16-05. Which organ does not have any hormone production?

a. heart  
b. kidney  
c. liver  
d. esophagus  
e. skin

16-06. The lipophobic hormones might use which of the following postreceptor events?

a. activation of adenylate cyclase  
b. opening of voltage-gated sodium channels in the plasma membrane  
c. modification of the receptor molecule or transfer of the hormone to a different carrier  
d. {a} or {b}
16-07. ACTH
   a. is secreted by the posterior pituitary
   b. secretion is regulated by an hypothalamic secretion
   c. causes the release of adrenal medullary hormones
   d. is not a tropic hormone

16-08. In what type of muscle does oxytocin cause contraction?
   a. skeletal muscle in the diaphragm
   b. cardiac muscle
   c. uterine smooth muscle and myoepithelial cells in the mammary glands
   d. all of the above

16-09. Enzyme action converts pro-opiomelanocortin into
   a. ACTH
   b. beta endorphin
   c. carotene-stimulating hormone
   d. ADH
   e. {a} and {b}

16-10. Which of these hormones is not produced by the adrenal cortex?
   a. aldosterone
   b. DHEA (dehydroepiandrosterone)
   c. epinephrine
   d. cortisol

16-11. The major targets of growth hormone are the
   a. blood vessels
   b. adrenal glands
   c. liver
   d. bones and skeletal muscles

16-12. Which of these hormones would be synthesized in smooth endoplasmic reticulum?
   a. insulin
   b. DHEA (dehydroepiandrosterone)
   c. growth hormone
   d. oxytocin

16-13. Insulin, a small, 51-amino-acid protein, is synthesized by the beta cells of the pancreas. This hormone is released
   a. in excessive amounts in obese individuals
   b. in response to several physical stress
   c. when blood glucose levels rise
   d. when blood glucose levels fall

16-14. Hormone levels are regulated by changes in secretion rate. This may come about because of
   a. positive feedback
   b. neuromuscular reflexes
   c. circadian rhythms
   d. any of the above
16-15. ADH (antidiuretic hormone)
a. increases urine output  
b. promotes dehydration  
c. is produced by the adenohypophysis  
d. is inhibited by alcohol

16-16. The precursor molecule for all steroid hormones is
a. DHEA (dehydroepiandrosterone)  
b. testosterone  
c. cholesterol

16-17. Sometimes prolonged exposure to high hormone concentrations causes a phenomenon known as
a. diabetes mellitus  
b. cellular inhibition  
c. receptor down-regulation  
d. protein kinase catabolism

16-18. The release of histamine by a mast cell to effect vasodilatation in the nearby tissue is an example of the release of a
a. neurohormone  
b. neurotransmitter  
c. paracrine  
d. hormone

16-19. Which of the following is not a category of endocrine gland stimulus?
a. enzymatic  
b. humoral  
c. neural  
d. hormonal

16-20. Erythropoietin is produced by what organ?
a. liver  
b. islets of Langerhans  
c. kidney

16-21. Gluconeogenesis occurs in the liver due to the action of:
a. aldosterone.  
b. insulin.  
c. glucagon.  
d. cortisol.

16-22. Normal development of the immune response is due in part to hormones produced by the:
a. adrenal medulla.  
b. pancreas.  
c. thyroid gland.  
d. thymus gland.
16-23. Virtually all of the protein or amino acid-based hormones exert their effects through intracellular:
   a. ions.
   b. deactivators.
   c. nucleotides.
   d. second messengers.

16-24. Chemical substances secreted by cells into the extracellular fluids that regulate the metabolic function of other cells in the body are called:
   a. enzymes.
   b. antibodies.
   c. proteins.
   d. hormones.

16-25. The hypothalamic-hypophyseal tract:
   a. connects the hypophysis to the pituitary gland.
   b. is partly contained within the infundibulum.
   c. conducts aldosterone to the hypophysis.
   d. is the site of prolactin synthesis.

16-26. Tropic hormones:
   a. include ACTH and TSH.
   b. do not regulate the function of other endocrine glands.
   c. exert their effects on cells by direct gene activation.
   d. include GH and PRL.

16-27. Growth hormone:
   a. is also called somatostatin.
   b. is regulated by humoral mechanisms.
   c. secretion results in a decrease in muscle mass.
   d. promotes long bone growth during the formative years.

16-28. Oxytocin:
   a. release is an example of a positive feedback control mechanism.
   b. is an adenohypophyseal secretion.
   c. exerts its most important effects during menstruation.
   d. controls milk production.

16-29. Thyroid hormone exerts its influence by:
   a. entering some cells and binding to intracellular receptors within the nuclei.
   b. exerting only a minor effect on body metabolism.
   c. causing a reduction in the number of blood vessel adrenergic receptors, and therefore decreasing blood pressure.
   d. acting to decrease basal metabolic rate.
16-30. Gonadocorticoid(s):
   a. synthesized by the adrenal medulla are primarily androgens.
   b. production by the adrenal gland is insignificant compared with sex hormone release from the gonads during late puberty.
   c. secretion inhibition is highly dependent on a negative feedback loop involving ACTH.
   d. hypersecretion can result in androgenital syndrome, also called testicular feminization.

16-31. Which of the following is not a change that may be caused by hormonal stimulus?
   a. a change in membrane potential
   b. the stimulation of a genetic event resulting in protein synthesis
   c. an increase in enzymatic activity
   d. direct control of the nervous system

16-32. The ability of a specific tissue or organ to respond to the presence of a hormone is dependent on:
   a. the location of the tissue or organ with respect to the circulatory path.
   b. the membrane potential of the cells of the target organ.
   c. the presence of the appropriate receptors on the cells of the target tissue or organ.
   d. nothing—all hormones of the human body are able to stimulate any and all cell types because hormones are powerful and nonspecific.

16-33. Several hormones are synthesized in the hypothalamus and transported to the anterior pituitary gland. The mechanism of transportation from hypothalamus to anterior pituitary gland is through the:
   a. hepatic portal system.
   b. general circulatory system.
   c. hypophyseal portal system.
   d. feedback loop.

16-34. The neurohypophysis or posterior lobe of the pituitary gland is not a true endocrine gland because:
   a. it is strictly a part of the neural system and has little or nothing to do with hormonal release.
   b. embryonically it was an endocrine tissue, but in the adult human it is no longer functional.
   c. it is unable to function as an endocrine tissue because it is actually part of the neural system due to its location.
   d. it is only a hormone storage area that receives hormones from the hypothalamus for release.
16-35. Steroid hormones exert their action by:
   a. entering the nucleus of a cell and initiating or altering the expression of a gene.
   b. finding an appropriate cell receptor and initiating cAMP activity.
   c. stimulating the synthesis of a glycogen.
   d. increasing blood pressure.

16-36. The second-messenger mechanism of hormone action operates by:
   a. synthesizing more of the hormone than is actually needed.
   b. increasing the basal metabolic rate in the target organ.
   c. not responding to a feedback mechanism.
   d. binding to specific receptors and employing the services of G proteins and cAMP.

16-37. Hormones often cause a cell to elicit multiple responses; this is because:
   a. there are thousands of receptors on the cell membrane.
   b. the receptors bind to several hormones at the same time.
   c. the protein kinases are rapidly metabolized.
   d. most cells have many different protein kinases with distinct substrates.

16-38. Cells that respond to peptide hormones usually do so through a sequence of biochemical reactions involving receptor and kinase activation. In order for cells to respond, it is necessary for first and second messengers to communicate. This is possible because:
   a. peptide hormones always enter the cell membrane and elicit a response without assistance from other messengers.
   b. hormones alter cellular operations through stimulation of a gene directly.
   c. G protein acts as the link between first and second messengers.
   d. the hormone receptor complex moves into the cytoplasm as a unit.

16-39. Thyroid hormone (a small iodinated amine) enters target cells in a manner similar to:
   a. insulin, because insulin is a small peptide.
   b. steroid hormones, because both diffuse easily into target cells.
   c. growth hormone, because the thyroid works synergistically with thyroid hormone.
   d. glucagon, because the structure of glucagon is similar to that of thyroid hormone.

16-40. When it becomes necessary to enlist the fight-or-flight response, a hormone that is released during the alarm phase of the general adaptation syndrome is:
   a. estrogen.
   b. epinephrine.
   c. angiotensinogen.
   d. renin.
16-41. One of the least complicated of the endocrine control systems directly responds to changing blood levels of ions and nutrients. Which of the following describes this mechanism?
   a. the rapid oxidation of carbohydrates
   b. catabolic inhibition
   c. protein synthesis
   d. humoral stimulation

16-42. The parathyroid glands maintain adequate levels of blood calcium. This is accomplished through:
   a. blocking the action of growth hormone.
   b. targeting the bone and activating osteoclasts so that calcium will be released.
   c. antagonizing the synthesis of calcitonin.
   d. slowing the activity of tissues that require calcium for activity.

16-43. Which organ is responsible for synthesizing ANP?
   a. the heart
   b. the kidney
   c. the skin
   d. the spleen

16-44. Mineralocorticoid is to aldosterone as glucocorticoid is to:
   a. testosterone.
   b. estrogen.
   c. cortisol.
   d. epinephrine.

16-45. Leptin is secreted by:
   a. lymphocytes.
   b. adipocytes.
   c. goblet cells.
   d. fibroblasts.

16-46. The most important regulator of electrolyte concentrations in extracellular fluids is:
   a. insulin.
   b. aldosterone.
   c. glucagon.
   d. cortisol.

16-47. Which of the following is not a steroid-based hormone?
   a. estrogen
   b. aldosterone
   c. epinephrine
   d. cortisone
16-48. Which of the following does not act as a second messenger in second-messenger systems of hormone action?
   a. cyclic AMP
   b. calmodulin
   c. cyclic GMP
   d. inositol triphosphate

16-49. Select the correct statement about hormonal structure or function.
   a. Prostaglandins are biologically active peptides.
   b. Modified cholesterol forms the main structural component of the peptone hormones.
   c. An amino acid derivative can be a hormone.
   d. An example of a local hormone is testosterone.

16-50. Which of the following would be associated with the action of steroids on cells?
   a. extracellular receptors with a specificity for only a single amino acid sequence on the hormone
   b. an enzyme that catalyzes the formation of cyclic AMP
   c. second-messenger systems
   d. a hormone-receptor complex that interacts directly with the cell's DNA

16-51. Cellular responses to hormones that initiate second-messenger systems include:
   a. possible activation of several different second-messenger systems.
   b. cyclic AMP phosphodiesterase formation of an active second messenger.
   c. formation of a specific protein kinase that acts on a series of extracellular intermediates.
   d. hormone binding to intracellular receptors.

16-52. Regulating hormones from the hypothalamus:
   a. enter venous circulation and travel to the heart, which pumps the hormone-containing blood to the pituitary.
   b. enter the hepatic portal system, which feeds the pituitary.
   c. travel by arteries to the pituitary.
   d. first enter into the hypophyseal portal system.

16-53. Which of the following is true about calcium homeostasis?
   a. Increased calcitonin levels will cause increased blood calcium levels.
   b. High calcium levels cause bone resorption.
   c. Parathyroid hormone causes an increase in osteoblast activity.
   d. Parathyroid hormone is the single most important regulator of calcium levels in the blood.

16-54. Aldosterone:
   a. is secreted by the neurohypophysis.
   b. functions to increase sodium resorption.
   c. presence increases potassium concentration in the blood.
   d. production is greatly influenced by ACTH.
16-55. The only amine hormone to act like a steroid is:
   a. TH.
   b. ACTH.
   c. GH.
   d. ADH.

16-56. Eicosanoids do not include:
   a. paracrines.
   b. leukotrienes.
   c. hydrocortisones.
   d. prostaglandins.

16-57. A man has been told that he is not synthesizing enough follicle-stimulating hormone (FSH), and for this reason he may be unable to father a child. Choose the correct statement to explain this problem.
   a. FSH stimulates estrogen secretion by ovarian cells; therefore it is not synthesized by males.
   b. The physician is wrong—a hormone made in the adenohypophysis could not influence fertility.
   c. FSH stimulates sperm production in the testes.
   d. The man must be producing progesterone, which inhibits the synthesis of FSH.

16-58. Which of the following organs is affected by thyroid hormone?
   a. liver
   b. spleen
   c. testes
   d. brain

16-59. Thyroxine is a peptide hormone, but its mechanism is different from other peptide hormones. Which of the following statements is true concerning this difference?
   a. It causes positive feedback.
   b. It does not require a second messenger to effect a response.
   c. It is very specific in the cell type it targets.
   d. It is a stimulant of cellular metabolism and targets all cells.
16-60. Glucocorticoids enable the body to deal appropriately with stress. They accomplish this by:
a. increasing blood glucose, fatty acid, and amino acid levels and enhancing blood pressure.
b. decreasing the heart rate, thus decreasing blood pressure.
c. stimulating the pancreas to release insulin.
d. blocking the neurotransmitters that prepare the body for the stress response.

16-61. What ion is sometimes used as a second messenger of amino acid-base hormones?
a. Iron  
b. Calcium  
c. Sodium  
d. Chlorine
The following statements are true/false:
   Answer [a] if true, [b] if false.

16-67. The stimulus for calcitonin release is usually excessive amounts of growth hormone synthesis.
[a]

16-68. Glucocorticoids are steroid hormones that usually enhance the immune responses when an individual is suffering from severe stress.
[a]

16-69. Direct gene activation involves a second-messenger system.
[b]

16-70. All peptide hormone synthesis requires gene activation that produces mRNA.
[b]

16-71. The antagonistic hormones that regulate blood calcium levels are calcitonin and parathormone.
[a]

16-72. Insulin elevates blood glucose concentrations.
[a]

16-73. The thyroid gland is embedded as small nodules in the mass of the parathyroid.
[a]

16-74. Many hormones synthesized by enteroendocrine cells are chemically identical to brain neurotransmitters.
[a]

16-75. All adenohypophyseal hormones affect their target cells via a cAMP second-messenger system.
[a]

16-76. Hormonal systems employing direct gene activation involve using a second-messenger system.
[b]

16-77. Diabetes insipidus and diabetes mellitus are both caused by a genetic mutation involving the synthesis of insulin.
[a]

16-78. Iodine is an essential element required for the synthesis of thyroxine.
[a]

16-79. In humans, melatonin may inhibit sexual maturation.
[b]

16-80. The endocrine structure that develops from the nervous system is the anterior pituitary.
[a]

16-81. Both “turn on” factors (hormonal, humoral, and neural stimuli) and “turn off” factors (feedback inhibition and others) may be modulated by the activity of the nervous system.
[a]

16-82. ACTH stimulates the adrenal cortex to release corticosteroid hormones.
[a]

16-83. LH in males is sometimes referred to as ICSH.
[b]

16-84. The only known effect of prolactin in humans is to produce impotence in males.
[b]

16-85. Oxytocin is a strong stimulant of uterine contractions.
[a]

16-86. Follicle cells of the thyroid gland produce thyroglobulin, while follicle cells of the parathyroid produce calcitonin.
[b]
16-87. The prime metabolic effect of cortisol is gluconeogenesis.
16-88. The beta cells are the pancreatic islet cells that produce insulin.
16-89. Type II diabetes lacks insulin activity.
16-90. Peptide hormones enter the target cells and elicit a response by mediating neurotransmitter effects.
16-91. Calcitonin is a peptide hormone that has destructive effects on the skeletal system.
16-92. Aldosterone is the most potent mineralocorticoid produced in the adrenals but the least abundant.
16-93. Atrial natriuretic peptide is a hormone that controls blood pressure in part by increasing the urinary secretion of sodium.
16-94. While glucagon is a small polypeptide, it is nevertheless very potent in its regulatory effects.
16-95. The thyroid gland is a large gland that controls metabolic functions throughout the life of an individual.
16-97. All of the following hormones are secreted by the adenohypophysis: ACTH, FSH, and LH.
16-98. The endocrine gland that is probably malfunctioning if a person has a high metabolic rate is the parathyroid.
16-99. Growth hormone always exerts its influence by targeting other endocrine glands to produce hormones.
Answers

16-01. c 16-29. a 16-57. c 16-89. a
16-02. b 16-30. b 16-58. d 16-90. b
16-03. d 16-31. d 16-59. b 16-91. b
16-04. c 16-32. c 16-60. a 16-92. b
16-05. d 16-33. c 16-61. b 16-93. a
16-06. d 16-34. d 16-94. a
16-07. b 16-35. a 16-67. b 16-95. a
16-08. c 16-36. d 16-68. b 16-97. a
16-09. e 16-37. d 16-69. b 16-98. b
16-10. c 16-38. c 16-70. a 16-99. b
16-11. d 16-39. b 16-71. a
16-12. b 16-40. b 16-72. b
16-13. c 16-41. d 16-73. b
16-14. c 16-42. b 16-74. a
16-15. d 16-43. a 16-75. b
16-16. c 16-44. c 16-76. b
16-17. c 16-45. b 16-77. b
16-18. c 16-46. b 16-78. a
16-19. a 16-47. c 16-79. a
16-20. c 16-48. b 16-80. b
16-21. c 16-49. c 16-81. a
16-22. d 16-50. d 16-82. a
16-23. d 16-51. a 16-83. a
16-24. d 16-52. d 16-84. b
16-25. b 16-53. d 16-85. a
16-26. a 16-54. b 16-86. b
16-27. d 16-55. a 16-87. a
16-28. a 16-56. c 16-88. a

Answers in bold represent corrections

Last corrected: 2008-06-16