

# Biology 30

Name: \_\_\_\_\_

Date: \_\_\_\_\_

## Endocrine Practice Quiz

1. Which gland produces a hormone that directly increases blood supply to skeletal muscles and increases the rate of contraction of heart muscle?
  - A. Pancreas
  - B. Adrenal gland
  - C. Thyroid gland
  - D. Pituitary gland
2. Which sequence illustrates a mechanism used by the body to control the blood glucose level?
  - A. Blood glucose increases → release of glucagon increases → conversion of glycogen into glucose decreases → blood glucose decreases
  - B. Blood glucose decreases → release of glucagon decreases → conversion of glycogen into glucose decreases → blood glucose increases
  - C. Blood glucose increases → release of insulin increases → conversion of glucose into glycogen increases → blood glucose decreases
  - D. Blood glucose decreases → release of insulin decreases → conversion of glucose into glycogen increases → blood glucose increases

*Use the following information to answer the next question.*

*Diabetes insipidus* is a disorder of the posterior lobe of the pituitary gland or hypothalamus resulting in decreased secretion of a specific hormone. This disorder is characterized by the excretion of large volumes of urine and subsequent dehydration and thirst. A person with *diabetes insipidus* can be treated by inhaling a spray containing the hormone that is deficient. The spray is inhaled several times a day.

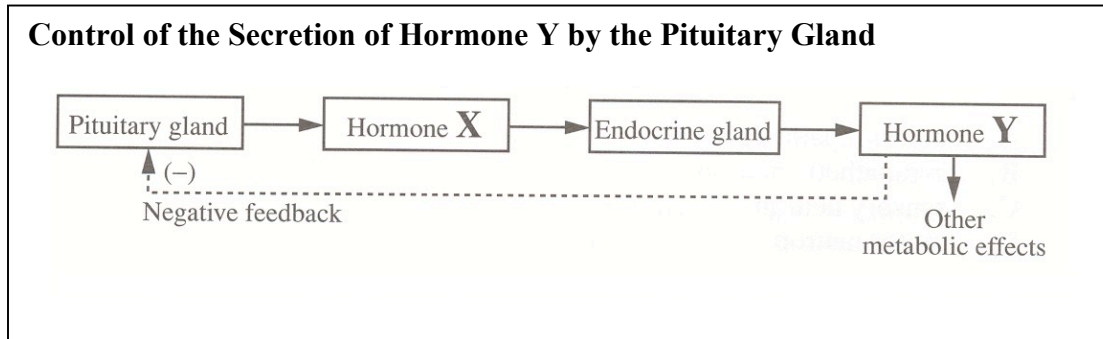
3. The inhaled spray would likely contain
  - A. insulin
  - B. glucagon
  - C. aldosterone
  - D. antidiuretic hormone

*Use the following information to answer the next two questions.*

When the Chernobyl nuclear reactor in Ukraine melted down, clouds of radioactive material, including iodine, were released into the atmosphere. Iodine is actively absorbed by a certain gland in the body. Scientists were worried that the radioactive iodine would cause tumors in this gland. In an attempt to avoid this problem, people who lived near the reactor were given large doses of non-radioactive iodine.

4. How would the ingestion of large doses of non-radioactive iodine reduce a person's chances of getting a tumor in a particular gland?
  - A. The pituitary would become saturated with non-radioactive iodine and this would limit the absorption of radioactive iodine.
  - B. The thyroid would become saturated with non-radioactive iodine and this would limit the absorption of radioactive iodine.
  - C. Increased levels of iodine would stimulate hormonal production by the pituitary and limit tumour formation.
  - D. Increased levels of iodine would stimulate hormonal production by the thyroid and limit tumour formation.
  
5. If a tumor caused increased secretion of thyroxine, which symptoms would likely be experienced by an affected person?
  - A. Increased body temperature and increased metabolic rate
  - B. Increased body temperature and decreased metabolic rate
  - C. Decreased body temperature and increased metabolic rate
  - D. Decreased body temperature and decreased metabolic rate
  
6. The pituitary hormone ACTH regulates the production of aldosterone by the cortex of the adrenal glands. A severe drop in ACTH levels would likely result in
  - A. decreased sodium ion retention and increased water loss because aldosterone levels would rise
  - B. decreased sodium ion retention and increased water loss because aldosterone levels would drop
  - C. increased sodium ion retention and increased water retention because aldosterone levels would rise
  - D. increased sodium ion retention and increased water retention because aldosterone levels would drop

Use the following information to answer the next question.



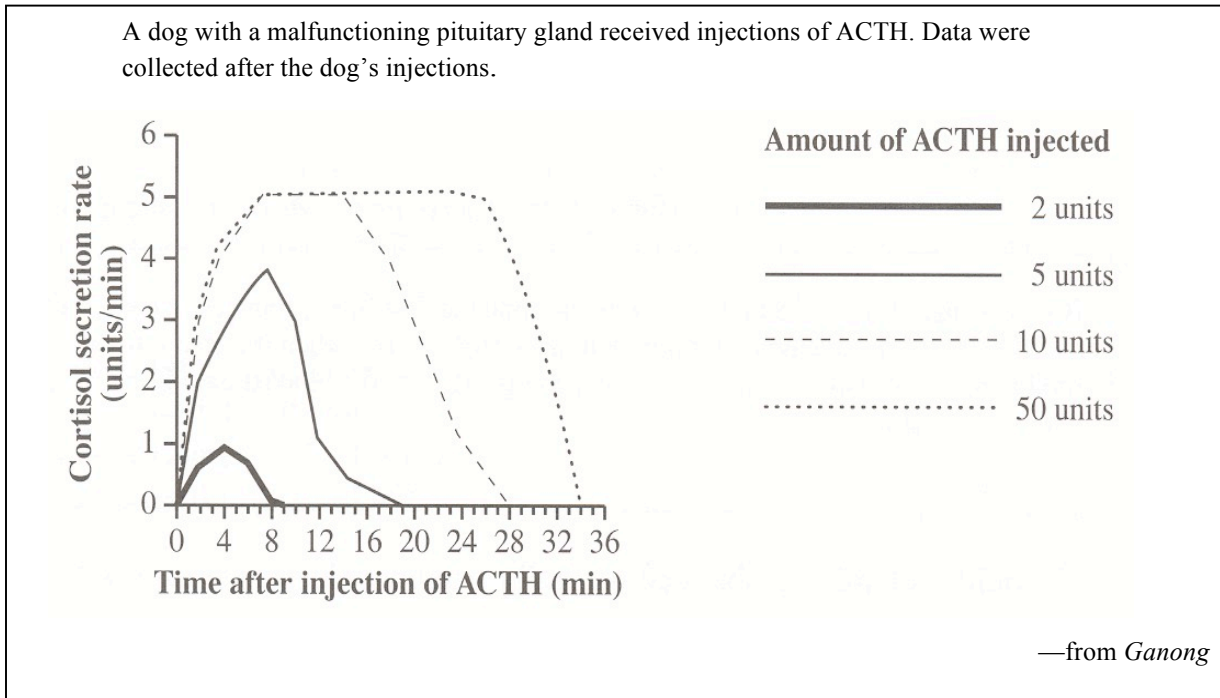
7. Normally, inhibition of the pituitary gland would occur if the secretion of hormone X
- A. increased, causing a decrease in the secretion of hormone Y
  - B. decreased, causing a decrease in the secretion of hormone Y
  - C. increased, causing an increase in the secretion of hormone Y
  - D. decreased, causing an increase in the secretion of hormone Y

Use the following information to answer the next two questions.

Stressful situations trigger the release of hormones such as cortisol. Recent studies have found that some forms of depression cause a similar hormonal response that lasts much longer than the normal stress response. This unregulated release of stress hormones may result in reduced appetite, an unresponsive immune system, inadequate tissue repair, and insomnia.

8. Another stress hormone whose functions mimic those of the sympathetic nervous system is
- A. HCG
  - B. insulin
  - C. estrogen
  - D. norepinephrine

Use the following additional information to answer the next question.



9. A logical interpretation of the graph is that the

- A. secretion of cortisol is inhibited by increased ACTH
- B. secretion of cortisol is doubled if the secretion of ACTH is doubled
- C. adrenal glands respond more quickly to small amounts of ACTH than to large amounts of ACTH
- D. adrenal glands respond to large amounts of ACTH by having a maximum cortisol secretion rate

Use the following information to answer the next question.

In 1947, E. B. Verney published the results of a series of experiments that he had conducted on a number of dogs. He found that if he injected a concentrated salt solution into the bloodstream, hypothalamus, and ventricles of the brain, hormone "X" was released in large amounts.

10. Hormone "X" was most likely

- A. ADH
- B. ACTH
- C. Oxytocin
- D. Aldosterone

Use the following information to answer the next two questions.

Bovine somatotropin (BST) is a growth hormone that has been produced using biotechnology since 1970. BST increases milk production by 10% to 20% when injected into milkproducing cows. BST increases nutrient absorption from the bloodstream into the cow's mammary gland.

—from *Harpp and Joseph*

11. BST could probably be obtained naturally from which gland in a cow?

- A. Thyroid
- B. Adrenal
- C. Pituitary
- D. Pancreatic

12. In a cow's mammary gland, BST is most similar in its effect to

- A. estrogen
- B. oxytocin
- C. prolactin
- D. progesterone

13. In humans, when iodine levels are adequate, abnormally high TSH secretion would likely result in

- A. nervousness and weight gain
- B. nervousness and weight loss
- C. sleepiness and weight gain
- D. sleepiness and weight loss

Use the following information to answer the next question.

Several studies have indicated that sperm counts in humans have declined over the past 25 years. Increased levels of chemicals in the environment that mimic estrogen have been found in substances ranging from detergents to plastic wrappers. These chemicals are a suspected cause of the decline in sperm counts.

—from *Stainsby*

14. Males exposed to high levels of these estrogen-mimicking chemicals could experience

- A. development of breasts
- B. development of ovaries
- C. increased growth of muscles
- D. increased growth of facial hair

15. During an emergency situation, the adrenal gland is stimulated to release a hormone that **directly** causes an increase in
- A. insulin levels
  - B. blood glucose levels
  - C. parasympathetic stimulation
  - D. conversion of glucose to glycogen

*Use the following information to answer the next question.*

A tumour of the adrenal medulla is called pheochromocytoma. This tumour causes hypersecretion of epinephrine and norepinephrine, and a number of other symptoms.

16. Possible symptoms of pheochromocytoma include
- A. increased heart rate, increased blood sugar, increased metabolic rate
  - B. decreased heart rate, increased blood sugar, increased metabolic rate
  - C. increased heart rate, decreased blood sugar, decreased metabolic rate
  - D. decreased heart rate, decreased blood sugar, decreased metabolic rate
17. A hormone that regulates glucose levels in the blood and a hormone that regulates  $\text{Na}^+$  in the blood and, indirectly, water reabsorption by the kidneys are, **respectively**,
- A. aldosterone and insulin
  - B. glucagon and aldosterone
  - C. epinephrine and glucagon
  - D. insulin and antidiuretic hormone
18. A condition that results in an enlargement of the thyroid gland may be caused by a diet deficient in
- A. iron
  - B. iodine
  - C. sodium
  - D. potassium

*Use the following information to answer the next question.*

The following procedures and observations were used to determine the function of secretions from an animal organ suspected of being an endocrine gland.

1. The suspected endocrine gland was surgically removed from the animal.
2. Symptoms in the animal were observed.
3. A chemical mixture was extracted from the suspected endocrine gland.
4. The chemical mixture was injected into the animal.
5. Symptoms in the animal were no longer observed.
6. Normal female rats injected with the chemical mixture showed accelerated body growth and increased estrogen production.

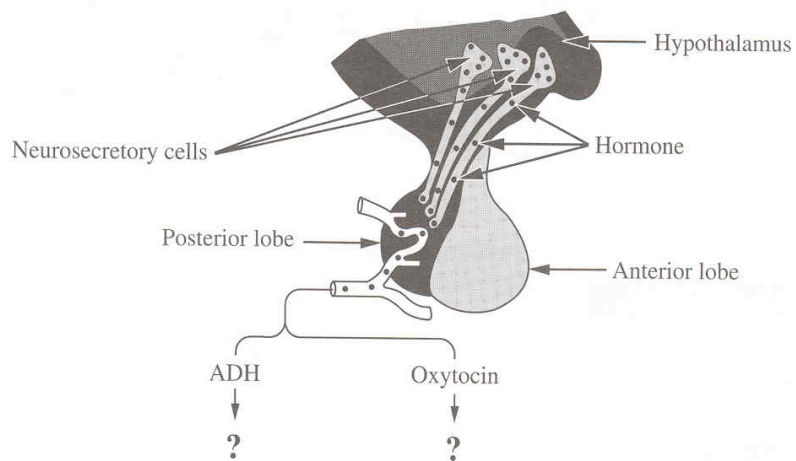
19. Based on these observations, the organ was

- A. an ovary
- B. the pancreas
- C. an adrenal gland
- D. the pituitary gland

*Use the following information to answer the next question.*

Oxytocin and ADH are synthesized by neurosecretory cells in the hypothalamus. These hormones are stored in the posterior pituitary. They can then be released into the bloodstream where they circulate to target cells.

**Hormones of the Pituitary and Hypothalamus**

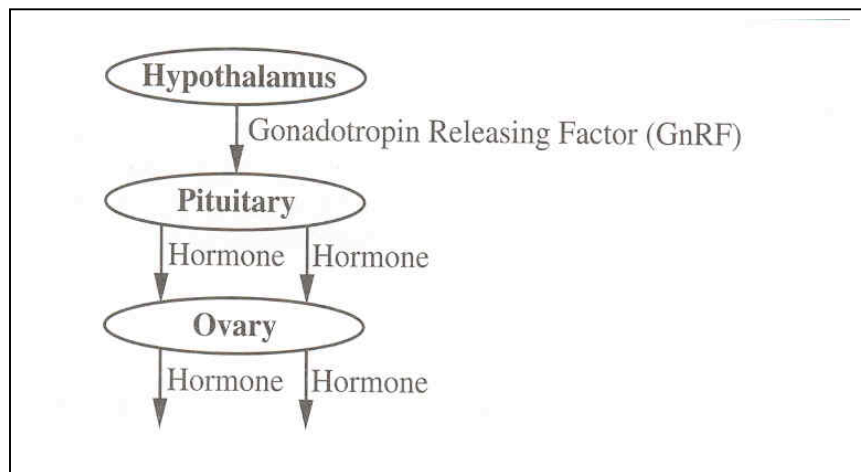


20. In a human female, where are the target cells for ADH and oxytocin?

- A. In the kidney tubules and ovaries
- B. In the Bowman's capsule and the ovaries
- C. In the kidney tubules and uterine muscles
- D. In the Bowman's capsule and the uterine muscles



Use the following information to answer the next question.



21. In humans, high levels of GnRF cause the pituitary to release

- A. LH and FSH
- B. LH and estrogen
- C. progesterone and FSH
- D. estrogen and progesterone

Use the following information to answer the next question.

### Responses Stimulated by Hormones

- |                                    |  |
|------------------------------------|--|
| 1 Release of thyroxine             | 4 Development of follicle and sperm              |
| 2 Development of bones and muscles | 5 Ovulation and maintenance of the corpus luteum |
| 3 Water reabsorption by kidneys    | 6 Milk production                                |

### Numerical Response

1. Identify the response, as numbered above, that would be stimulated by each of the hormones given below.

**Response:** \_\_\_\_\_  
**Hormone:**     **HGH**            **LH**            **TSH**            **FSH**

(Record your **four-digit answer** in the numerical-response section on the answer sheet.)

*Use the following information to answer the next three questions.*

The thyroid gland secretes the hormones thyroxine and calcitonin. Embedded in the thyroid gland are the four parathyroid glands. The parathyroid glands secrete the parathyroid hormone (PTH). Calcitonin and PTH work antagonistically to maintain homeostasis of calcium ion concentrations in the blood. High levels of calcium ions stimulate the secretion of calcitonin, which causes deposition of calcium in the bones.

22. Low levels of calcium ions in the blood cause

- A. decreased secretion of PTH and increased deposition of calcium in the bones
- B. decreased secretion of calcitonin and increased deposition of calcium in the bones
- C. increased secretion of PTH and movement of calcium from the bones to the blood
- D. increased secretion of calcitonin and movement of calcium from the bones to the blood

23. The release of thyroxine from the thyroid is directly regulated by

- A. TSH
- B. TRH
- C. iodine
- D. thyroxine

24. A characteristic symptom of hyperthyroidism, a disorder of the thyroid gland, is

- A. lethargy
- B. weight loss
- C. intolerance to cold
- D. slowed mental processes

25. Which of the following hormones plays a role in returning the salt concentration in the blood to homeostatic levels following heavy exercise?

- A. Cortisol
- B. Thyroxine
- C. Aldosterone
- D. Epinephrine

*Use the following information to answer the next question.*

Chemicals found in alcohol and tea have a diuretic effect. Diuretics cause the body to produce greater-than-normal volumes of urine.

26. Diuretic chemicals counteract the effect of the hormone

- A. ADH
- B. insulin
- C. cortisol
- D. prolactin

27. Damage to which of the following endocrine glands would **most affect** the reaction of the body to an emergency that stimulates the sympathetic nervous system?

- A. Thyroid gland
- B. Adrenal gland
- C. Anterior pituitary gland
- D. Posterior pituitary gland

*Use the following information to answer the next question.*

**Some Functions of Hormones**

- 1 Promote muscle and bone development
- 2 Increase water reabsorption in the kidneys
- 3 Increase the level of amino acids in blood plasma
- 4 Stimulate the conversion of glucose into glycogen

**Numerical Response**

**2.** Identify the main function of each hormone named below.

- |                |  |
|----------------|--|
| ADH _____      | (Record in column 1 on the answer sheet) |
| Cortisol _____ | (Record in column 2 on the answer sheet) |
| HGH _____      | (Record in column 3 on the answer sheet) |
| Insulin _____  | (Record in column 4 on the answer sheet) |
-

Key

1. B
2. C
3. D
4. B
5. A
6. B
7. C
8. D
9. D
10. A
11. C
12. C
13. B
14. A
15. B
16. A
17. A
18. B
19. D
20. C
21. A
22. C
23. A
24. B
25. C
26. A
27. B

NR1 2514  
NR2 2314