

ENDOCRINE SYSTEM

Hormones coordinate the biochemical functioning of the body by acting on certain organs called target organs. These hormones will stimulate specific reactions from these target organs. For more information, read Chapter 20: Hormones pages 391- 411 in your text.

The Function of Hormones

Many physiological processes are either directly or indirectly under the control of chemical messengers called *hormones*.

1. Hormones are said to be "chemical messengers". (p. 392.)

a. Why are they called chemical messengers?

b. How are they transported through the body?

2. Be able to identify the following endocrine glands from fig. page

a. anterior pituitary

b. thymus

c. posterior pituitary

d. thyroid

e. parathyroid

f. adrenal cortex

g. adrenal medulla

h. pancreas

i. testis

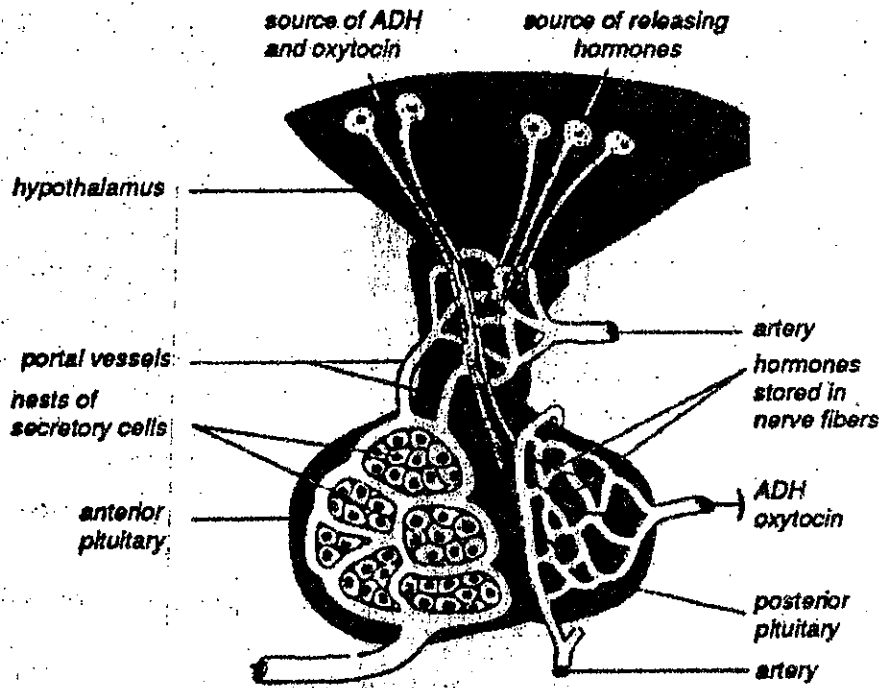
j. ovary

Control by Hormones

The hypothalamus and pituitary glands work together to control many physiological activities of the body. Together, the hypothalamus and pituitary can act as one.

1. Your hypothalamus is located at the base of the brain. It can stimulate the anterior and posterior pituitary to secrete several hormones. List these hormones on the next page. (p.394 and table 20.1)

Hormones released by the anterior pituitary	Hormones released by the posterior pituitary



The Hypothalamus

2. The hypothalamus and pituitary are the neuroendocrine control centres of the body. Explain how the hypothalamus and pituitary control body processes. (p. and p. ncluding fig.)

Negative and Positive Feedback Loops

The body maintains homeostasis by being able to adjust to physiological changes. The adjusting mechanism for this is called a *negative feedback loop*. Your household heating is like a negative feedback loop. When the temperature drops, the thermostat senses this drop and turns on the heater. When the heat has reached a proper level, the thermostat turns the heater off. In this way the house is kept at a comfortable temperature level. We could say household "homeostasis" is maintained.

While negative feedback loops are common in the body, positive feedback loops are quite rare. Labour pain during birth is an example of a positive feedback loop. At the onset of labour, the hormone oxytocin is released into the body, causing the uterus to contract. As the head of the fetus pushes on the cervix, more oxytocin is released, which causes the uterus to contract more strongly. (p.)

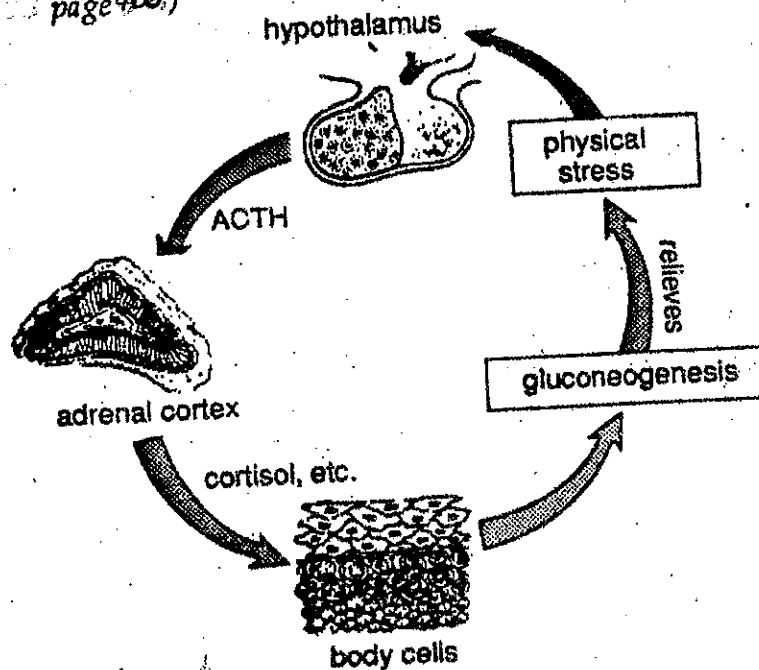
1. What elements make up a negative feedback loop? Use fig. p. to answer the question.

Other Hormones

Below is a list of hormones that control body processes. You will be required to know the *source* of the hormone, the *target organ* that it affects, and give an description of its *action*.

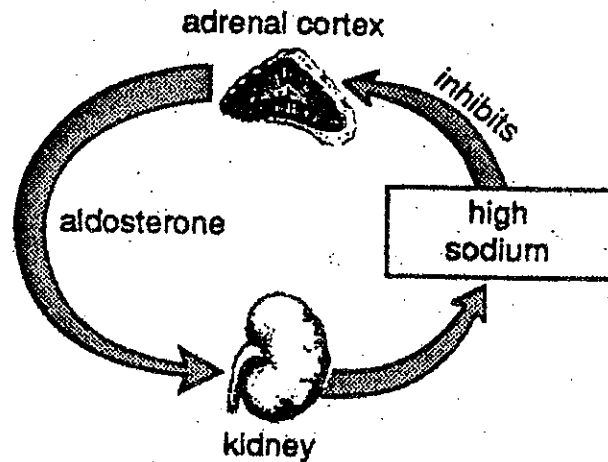
Cortisol

(p. table page 400)



1. Source
2. Target organ(s)
3. Action
4. Cortisol increases *gluconeogenesis*. Explain this process and give an example. (fig. p.)
5. How does cortisol help the body react to stress? (fig.)
6. During stress, the amino acid level in the blood will rise. What stimulates this reaction? (p.)
7. Explain how cortisol counteracts an inflammatory response in the body. (p.)

Aldosterone



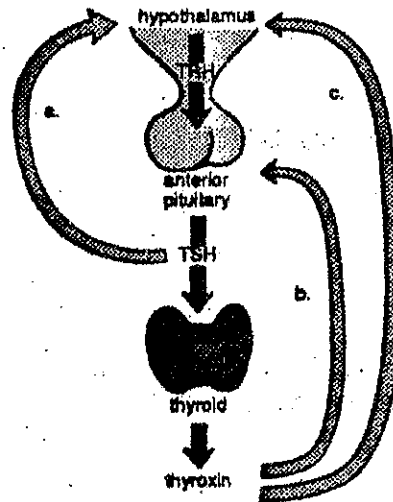
1. Source
2. Target organ(s)
3. Action

Adrenalin

(p. 399)

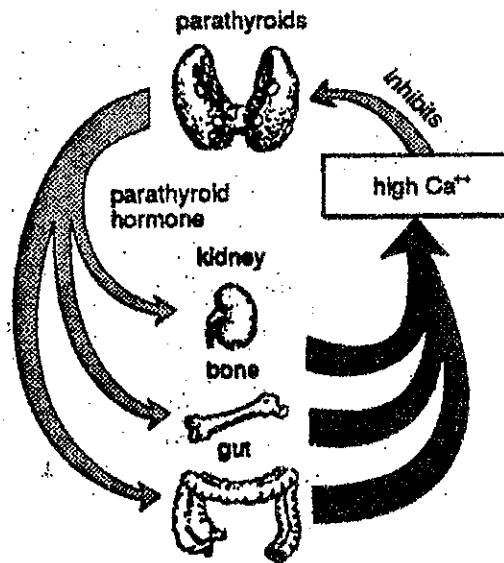
1. Source
2. Describe its primary action
3. Target organ(s)

Thyroxin
(pp. 397)



1. Source
2. Describe its primary action
3. Target organ(s)

Parathormone
(p.398)



1. Source
2. Describe its primary action
3. What is its target organ(s)

Insulin

(p. 402)

1. Source
2. Describe its primary action
3. Target organ(s)

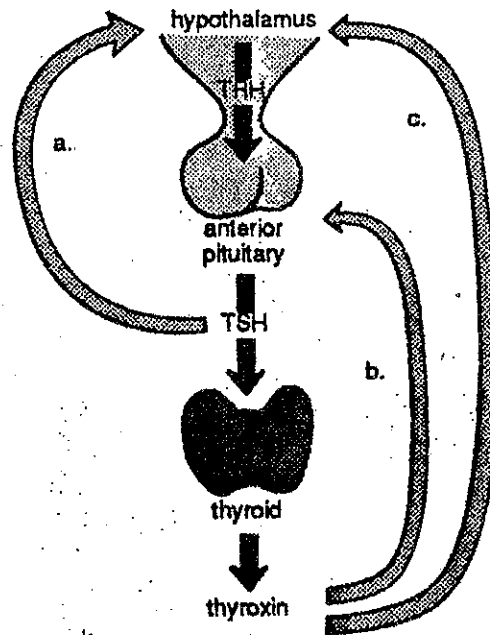
Glucagon

(p. 402)

1. Source
2. Describe its primary action
3. Target organ(s)

Thyroid Stimulating Hormone (TSH)

(Fig 20.2 p. 394)



1. Source
2. Describe its primary action
3. Target organ(s)

Adrenocorticotopic Hormone (ACTH)

(p. 394 fig. 20.2)

1. Source
2. Describe its primary action
3. Target organ(s)

Follicle Stimulating Hormone (FSH)

(pp. 395)

1. Source
2. Describe its primary action
3. Target organ(s)

Luteinizing Hormone (LH)

(p. 395)

1. Source
2. Describe its primary action
3. Target organ(s)

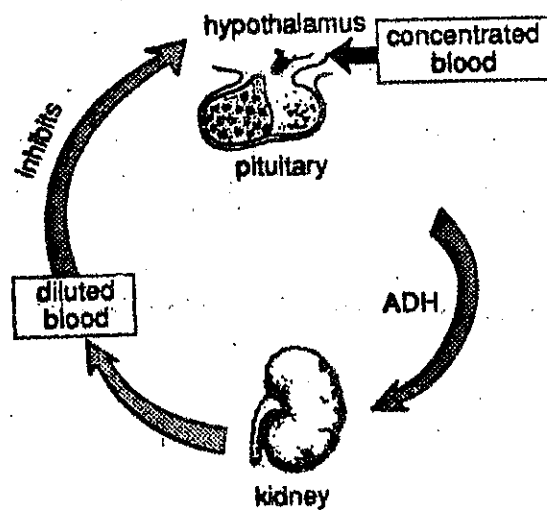
Growth Hormone (GH)

(p. 396)

1. Source
2. Describe its primary action
3. Target organ(s)

Antidiuretic Hormone (ADH)

(p. 310)



1. Source
2. Describe its primary action
3. Target organ(s)

Oxytocin

(p. 455)

1. Source
2. Describe its primary action
3. Target organ(s)

Prostaglandins

(p. 405)

1. What is its chemical composition?
2. What is the source of this hormone?
3. What is the function of prostaglandins?

Disorders of the Endocrine System

State the *characteristics*, possible *causes*, and *corrective measures* for any two of the following disorders:

dwarfism
giantism
goiter
diabetes mellitus

Thermoregulation

(p. 207 fig. 11.13)

1. Explain how the body will respond to:
 - a. high temperature
 - b. low body temperature
2. Define hypothermia, and describe the situations that would bring it on.

Sample Exam Questions

1. Compare and contrast a negative and positive feedback loop. Use specific examples from hormones that you have learned.
2. The hypothalamus and pituitary gland work together as a unit to control body function. Explain this functional relationship and give a specific example.
3. Explain how a hormone is a chemical messenger.
4. Both the nervous and the endocrine systems provide a means of communication with the body. Compare the two systems under the following headings:
 - a. Speed of communication
 - b. Target organ(s)
 - c. Duration of message
 - d. Means of transmission
5. Explain why it is unsafe to remain in a sauna at 40°C and 100% relative humidity for a long period of time.