3. Chemical Messages for Homeostasis

Let us assess

1. Question

The hormone that helps in the reabsorption of water in the kidneys.

A. TSH

B. ACTH

C. ADH

D. GTH

Answer

Antidiuretic hormone or vasopressin is the hormone that helps in reabsorption of water in the kidneys. ADH increases the water permeability of the cells by inserting aquaporin-2 at the end of distal convoluted tubule and collecting duct. Also, diuretic is any substance that causes water loss, therefore anti-diuretic prevents water loss.

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2. Question

Identifying the word- pair relationship fill in the blank.

Thyroxine: Thyroid gland

Epinephrine: .....

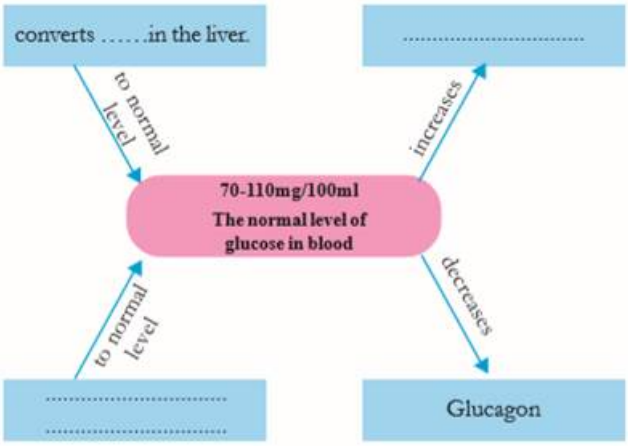
Answer

Epinephrine: Adrenal medulla

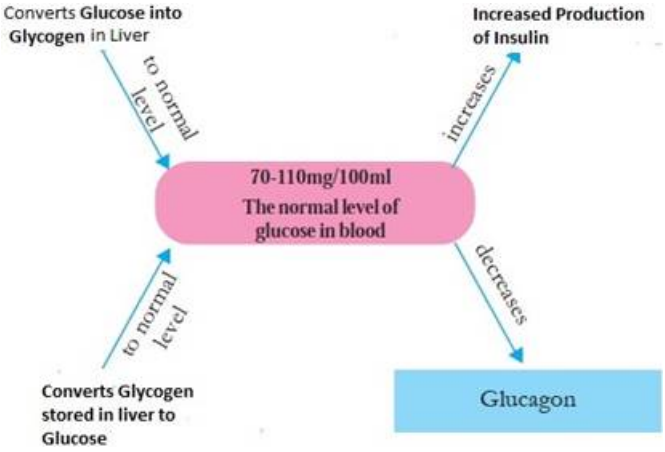
Explanation- Thyroxine is secreted by thyroid gland. Epinephrine is secreted by adrenal medulla under conditions of stress etc. it breaks glycogen in the liver and muscles, stimulates glucagon secretion and inhibits insulin secretion.

3. Question

Complete the illustration suitably.



Answer



Extended activities

1. Question

Conduct a seminar on the topic – The Role of the Endocrine System in maintaining homeostasis.

Answer

Homeostasis is maintenance and regulation a constant internal environment in a living organism in response to changes in the external environment condition. The endocrine system works along with the nervous system to maintain homeostasis.

When any change occurs in the body, the receptors sense the change to make adjustments. Signals are sent to the brain which thereby generate responses that are signalled to effector. The effector is usually a gland. Body uses two feedback loops in order to maintain homeostasis.

1. Negative feedback- When any change occurs in the body, message is sent to the brain which then instructs the effector (gland and muscles) to reverse the change. Thus, any homeostatic process that changes the direction of stimulus is negative feedback. For example- when a person intakes food, the food is digested which causes the blood glucose levels to rise. Higher blood glucose levels thereby cause the pancreas to secrete insulin in the blood. Upon high insulin levels glucose is transported into cells and glucose is stored in liver cells as glycogen, thereby dropping the glucose levels and hence the pancreas stops secreting insulin

2. Positive feedback- When any change occurs in the body and the body intensifies the change until the stimulus causing the change is ridden off it is known as positive feedback. For example- positive feedback results in the birth of a human infant. The head of the foetus pushes against the cervix causing it to stretch. Cervix sends nerve impulses to the brain. The brain thereby stimulates secretion of oxytocin by the pituitary gland which travels in the bloodstream to uterus and causes the uterus to contract thus pushing the foetus towards cervix.

2. Question

Conduct a debate on 'Use of artificial plant hormones problems and possibilities'.

Answer

Artificial Plant Hormones are synthetically synthesized replicas of Plant Hormones which have contributed to the agricultural sector. Some of the most used Artificial Plant Hormones are :-

1. Auxin:- Used for Sprouting and prevents falling of premature fruits. It is also used as Weedicide. Eg:- Naphthalene Acetic Acid and Indol Butyric Acid

2. Gibberellins:- This Artificial Plant Hormone is used for increasing Fruit Size especially in Grape and Apple and also used for prevention of ripening of fruits

3.Abscisic Acid:- Used to Accelerate the process of dropping of Fruits

These Artificial Plant Hormones also have harmful effects when used excessively as they can interfere with the natural growth Cycle of the plant. Apart from that they also leak into ground thus reaching and polluting the groundwater. Traces of Artificial Plant Hormones can pass onto Food Chain which can have serious Implications