Edexcel Biology GCSE

Topics 7.1 to 7.3 - Hormonal control

Flashcards

What is the endocrine system?

What is the endocrine system?

A network of glands that produce and secrete hormones into the bloodstream

What is a hormone?

What is a hormone?

- A cell signalling molecule produced by endocrine glands and released into the blood
- Travels to a target organ and binds to receptors on effectors initiating a response

Compare the endocrine and nervous systems (4)

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Endocrine system	Nervous system
Uses hormones	Uses nerve impulses
Hormones travel in the bloodstream to the target organ	Nerve impulses travel via neurones to the effectors
Slower response	Faster response
Lasts until all hormones have broken down which takes a long amount of time	Lasts until the nerve impulse stops which takes a short amount of time

What is the pituitary gland?

What is the pituitary gland?

Described as the ‘master gland’

Endocrine gland that produces hormones which control other glands (e.g. adrenal glands)

What are the adrenal glands?

What are the adrenal glands?

Endocrine glands that produce adrenaline

Where are the adrenal glands located?

Where are the adrenal glands located?

Above the kidneys

What is adrenaline? (higher)

What is adrenaline? (higher)

A hormone produced by the adrenal glands that is involved in the ‘fight or flight’ response (where the body prepares to confront danger or flee from it)

State the effects of adrenaline on the body (4) (higher)

State the effects of adrenaline on the body (4) (higher)

- Increases heart rate
- Increases blood pressure
- Increases blood flow to muscles
- Increases blood glucose levels

Describe how adrenaline increases heart rate and blood pressure (higher)

Describe how adrenaline increases heart rate and blood pressure (higher)

- Secreted by the adrenal glands, travels in the blood to the heart
- Binds to specific receptors on cells in the heart
- Causes heart muscle to contract more forcefully and frequently
- **∴ heart rate increases, blood pressure increases**

Describe how adrenaline increases respiration at muscle tissues (higher)

Describe how adrenaline increases respiration at muscle tissues (higher)

- Adrenaline binds to specific receptors on cells in the liver
- Triggers breakdown of glycogen stores and release of glucose
  ∴ blood glucose levels increase
- Increased heart rate causes **greater blood flow to muscles**
- ∴ muscle cells receive more oxygen and glucose for respiration

What is negative feedback? (higher)

What is negative feedback? (higher)

- A **corrective mechanism** that allows only small shifts from a set point
- It reverses a change in conditions e.g. if the concentration of a hormone increases, negative feedback systems work to reduce the concentration back to normal level

What is the thyroid gland?

What is the thyroid gland?

Endocrine gland that produces thyroxine

Where is the thyroid gland located?

Where is the thyroid gland located?

In the neck

What is thyroxine? (higher)

What is thyroxine? (higher)

A hormone secreted by the thyroid gland that controls metabolic rate, heart rate and temperature.

What is metabolic rate? (higher)

What is metabolic rate? (higher)

The rate at which biochemical reactions occur in cells

Describe how thyroxine is released (higher)

Describe how thyroxine is released (higher)

- Hypothalamus secretes TRH
- TRH stimulates secretion of TSH from pituitary gland
- TSH stimulates the release of thyroxine from the thyroid gland

What does TRH stand for? (higher)

What does TRH stand for? (higher)

Thyrotropin releasing hormone

What does TSH stand for? (higher)

What does TSH stand for? (higher)

Thyroid-stimulating hormone

Describe how a negative feedback system controls blood thyroxine levels (higher)

Describe how a negative feedback system controls blood thyroxine levels (higher)

- If blood thyroxine levels **increase** above a set point, TRH and TSH secretion is inhibited. Less thyroxine is produced by the thyroid gland. Thyroxine levels return to normal.
- If blood thyroxine levels **decrease** below a set point, TRH and TSH secretion is increased. More thyroxine is produced by the thyroid gland. Thyroxine levels return to normal.

How do the ovaries act as an endocrine gland?

How do the ovaries act as an endocrine gland?

They secrete oestrogen into the bloodstream

How do the testes act as an endocrine gland?

How do the testes act as an endocrine gland?

They secrete testosterone into the bloodstream