

Hormones

Revision notes · Hormones and endocrine glands, how hormonal and nervous control compare, and the effects of adrenaline.

For Cambridge IGCSE Biology 0610 (and 0970, which has the same content). **Supplement** is Extended content, only examined on Papers 2 and 4.

Hormones Spec 14.3

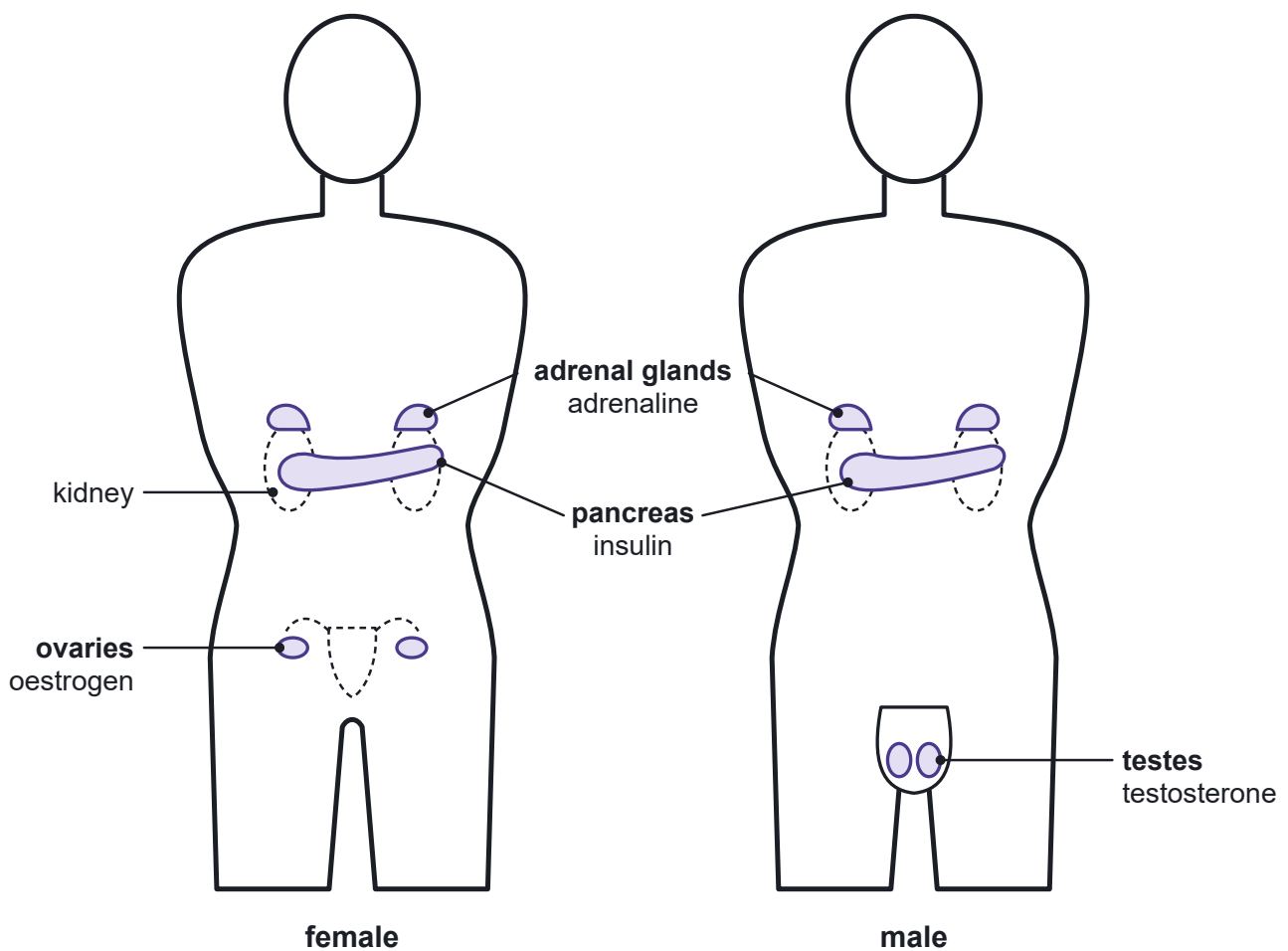
Hormones and endocrine glands Spec 14.3.1, 14.3.2, 14.3.4

A **hormone** is a chemical substance, produced by a gland and carried by the blood, which alters the activity of one or more specific target organs.

Hormone

A chemical substance, produced by a gland and carried by the blood, which alters the activity of one or more specific target organs.

The glands that make hormones are called **endocrine glands**. They release hormones straight into the blood. The blood carries the hormone around the whole body, but it only affects its target organs.



The endocrine glands and the hormones they secrete.

Endocrine glands and the hormones they secrete

Gland	Hormone secreted
Adrenal glands	Adrenaline
Pancreas	Insulin
Testes	Testosterone
Ovaries	Oestrogen

Nervous control and hormonal control

Comparing nervous and hormonal control

	Nervous control	Hormonal control
Speed of action	Very fast: impulses travel quickly along neurones	Slower: hormones travel in the blood
Duration of effect	Short: the effect stops soon after the impulse stops	Longer: the effect can last minutes, hours or longer

Exam tip: In a comparison, always give both sides. Say 'nervous is fast and hormonal is slower', not just 'hormones are slow'.

Adrenaline Spec 14.3.3, 14.3.6

Adrenaline is the hormone secreted by the adrenal glands in 'fight or flight' situations. These are moments of danger or stress when the body must get ready to fight or run away.

- Increased breathing rate
- Increased heart rate
- Increased pupil diameter

These changes get more oxygen and glucose to the muscles quickly, and let more light into the eyes so the person can see the danger better.

Supplement

Adrenaline and metabolic activity

Supplement

Adrenaline also controls metabolic activity. It **increases the blood glucose concentration** and **increases heart rate**.

Supplement

- Adrenaline increases the blood glucose concentration, so more glucose is available to the muscles.
- Adrenaline increases heart rate, so this glucose, and oxygen, reach the muscles more quickly.
- The muscle cells use the glucose in respiration to release energy for movement.

Common mistake: Adrenaline is spelt with an e at the end. Do not write that it 'gives you energy'. It raises blood glucose so cells can release energy by respiration.

Quick check

- 1 . Which gland secretes insulin?
- 2 . Name the hormone made by the testes.
- 3 . Which type of control has the longer-lasting effect, nervous or hormonal?
- 4 . **Supplement** State two ways adrenaline affects the metabolic activity of the body.

Quick check answers

Hormones

1. The pancreas.
2. Testosterone.
3. Hormonal.
4. It increases blood glucose concentration and increases heart rate.