

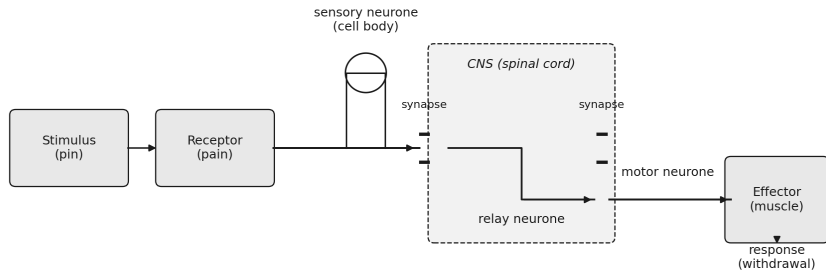
Exercise walk-through

5.3

Hormonal coordination (4.5.3)

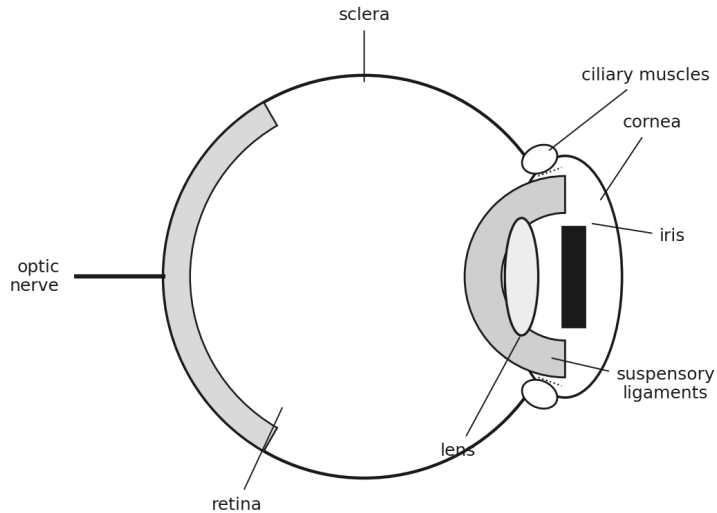
AQA · GCSE · Biology

The reflex arc



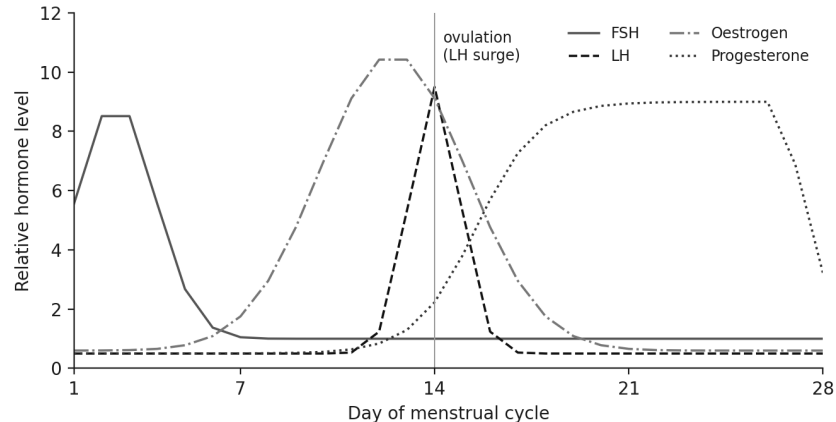
- Automatic and rapid — no conscious brain involved.
- Sensory neurone, synapse, relay neurone, motor neurone.
- At a synapse a chemical diffuses across the gap.

The eye and accommodation



- Named parts: retina, optic nerve, sclera, cornea, iris, ciliary muscles, suspensory ligaments.
- Near: ciliary muscles contract, ligaments loosen, lens thick.
- Distant: muscles relax, ligaments tight, lens thin.

The menstrual cycle



- FSH matures the egg; LH surge releases it — ovulation, about day 14.
- Oestrogen builds the lining; progesterone maintains it.
- (HT) read the four-hormone graph.

Exercises 2.1·2.3

2.1 Why are hormonal responses slower than nervous responses but longer-lasting? [2]

2.2 Name the hormone that lowers blood glucose and the organ that produces it. [2]

2.3 (HT) Name the hormone that stimulates ovulation. [1]

Exercises 2.1·2.3

2.1 Why are hormonal responses slower than nervous responses but longer-lasting? [2]

2.1 Hormones travel in the bloodstream to reach their target organ, which is slower than electrical impulses along neurones; but hormones are not broken down immediately, so their effect lasts longer.

2.2 Name the hormone that lowers blood glucose and the organ that produces it. [2]

2.2 Insulin; the pancreas.

2.3 (HT) Name the hormone that stimulates ovulation. [1]

2.3 LH.

Exercises 3.1·3.3

3.1 Compare Type 1 and Type 2 diabetes: cause and treatment.

[4]

3.2 (*HT*) Explain how negative feedback keeps blood glucose concentration constant, naming both hormones.

[4]

3.3 (*Bio, HT*) Explain how the body responds to dehydration by producing concentrated urine.

[4]

Exercises 3.1-3.3

3.1 Compare Type 1 and Type 2 diabetes: cause and treatment. [4]

3.1 Type 1: the pancreas fails to produce sufficient insulin; treated with insulin injections. Type 2: body cells no longer respond to the insulin produced; treated with a carbohydrate-controlled diet and an exercise regime. Obesity is a risk factor for Type 2.

3.2 (*HT*) Explain how negative feedback keeps blood glucose concentration constant, naming both hormones. [4]

3.2 When glucose is too high the pancreas releases insulin, so cells take up glucose and liver/muscle converts it to glycogen, and glucose falls; when glucose is too low the pancreas releases glucagon, converting glycogen back to glucose released into the blood, and glucose rises; each change switches the opposite response off – negative feedback.

3.3 (*Bio, HT*) Explain how the body responds to dehydration by producing concentrated urine. [4]

3.3 Dehydration makes the blood too concentrated, detected by the hypothalamus/receptor; the pituitary gland releases more ADH into the blood; ADH makes the kidney tubules more permeable, so more water is selectively reabsorbed into the blood; so less, more concentrated, urine is produced – an example of negative feedback.

Exercise 3.4

3.4 (*HT*) A couple cannot conceive because the woman's eggs do not mature. Describe how IVF could help them and give two concerns they should weigh. [5]

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3.4 (*HT*) A couple cannot conceive because the woman's eggs do not mature. Describe how IVF could help them and give two concerns they should weigh. [5]

3.4 The woman is given FSH and LH to stimulate several eggs to mature; eggs are collected and fertilised with the father's sperm in the laboratory; embryos develop into tiny balls of cells and one or two are inserted into the uterus. Concerns: it is emotionally and physically stressful; success rates are not high and it can lead to multiple births, a risk to babies and mother.