

14.3 Hormones

Name: _____ Class: _____ Date: _____ **Total: 19 marks**

KEY WORDS hormone 激素 • glucose 葡萄糖 • adrenaline 肾上腺素 • insulin 胰岛素
• target organs 靶器官

Objective

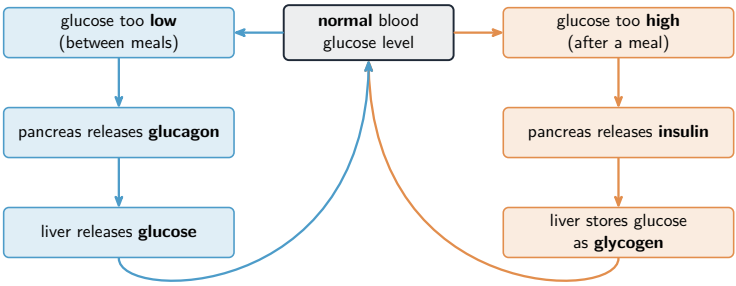
Build the skills to answer exam questions on **hormones** 激素 — what they are, the main glands and hormones, **adrenaline** 肾上腺素, and nervous vs hormonal control.

You must be able to:

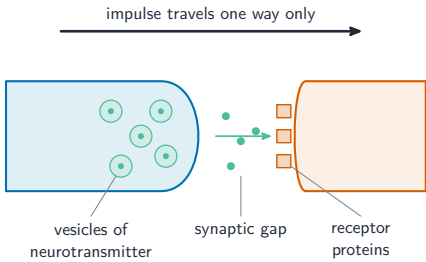
- define a hormone and name the main glands and their hormones
- describe the effects of adrenaline
- compare nervous and hormonal control

1 Worked examples

■ Hormones



Hormones are chemicals made by glands, carried in the blood, acting on target organs



Hormonal control compared with nervous (synapse) control

Gland	Hormone
adrenal	adrenaline
pancreas	insulin (and glucagon)
ovaries / testes	oestrogen / testosterone

2 Practice

2.1 Define a hormone. [2]

2.2 Name the gland that releases adrenaline. [1]

3 Exam-style questions

3.1 Compared with nervous control, hormonal control is: [1]

- A faster and shorter-lived
- B slower and longer-lasting
- C electrical
- D instant

3.2 Adrenaline is released in 'fight or flight' situations.

(a) State two effects of adrenaline on the body. [2]

(b) State how a hormone travels to its target organ. [1]

3.3 A person walking alone at night hears a sudden loud noise. Adrenaline is released.

(a) State what a hormone is, and name the type of gland that makes one. [2]

(b) Name the gland that releases adrenaline and describe **three** effects it has on the body. [4]

(c) Explain how each of the three effects helps the person deal with danger. [3]

(d) Compare nervous and hormonal control under **three** headings: how the message travels, how fast it acts, and how long the effect lasts. [3]

Solutions

2.1 a chemical made by a gland, carried in the blood, that changes the activity of a target organ.

2.2 the adrenal gland.

3.1 B. Hormonal control is slower but longer-lasting.

3.2 (a) any two of: increases heart rate; increases breathing rate; raises blood glucose; widens the pupils.

(b) in the blood.

3.3 (a) A hormone is a chemical messenger, made in one place and carried in the **blood** to act on target organs elsewhere; it is made by an **endocrine** (ductless) gland.

(b) The **adrenal glands**, just above the kidneys. Any three of: heart rate and breathing rate increase; the pupils widen; blood is diverted from the gut to the muscles, and stored glycogen is converted to glucose.

(c) A faster heart and breathing rate deliver more oxygen and glucose to the muscles; wider pupils let in more light so more can be seen; more blood and more glucose reaching the muscles means more respiration and so more energy for running or fighting.

(d) Nervous messages travel as **electrical impulses along neurones**, hormonal messages as **chemicals in the blood**; nervous is very fast (a fraction of a second), hormonal is slower (seconds to minutes); nervous effects are short-lived, hormonal effects last much longer.