

14.4 Homeostasis

Name: _____ Class: _____ Date: _____

Total: 9 marks

KEY WORDS set point 设定点 • blood glucose 血糖 • diabetes 糖尿病 • sweating 出汗 • environment 环境

Objective

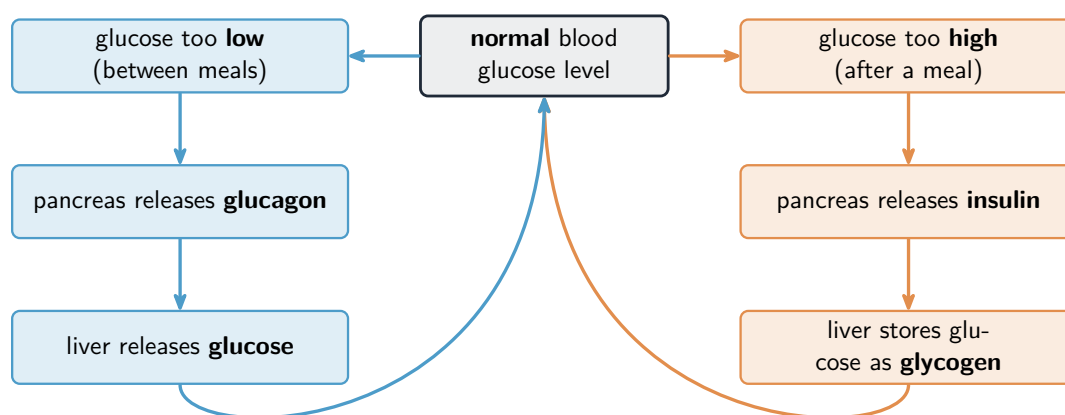
Build the skills to answer exam questions on **homeostasis** 稳态 — **negative feedback** 负反馈, controlling **blood glucose** 血糖, **diabetes** 糖尿病, and temperature control.

You must be able to:

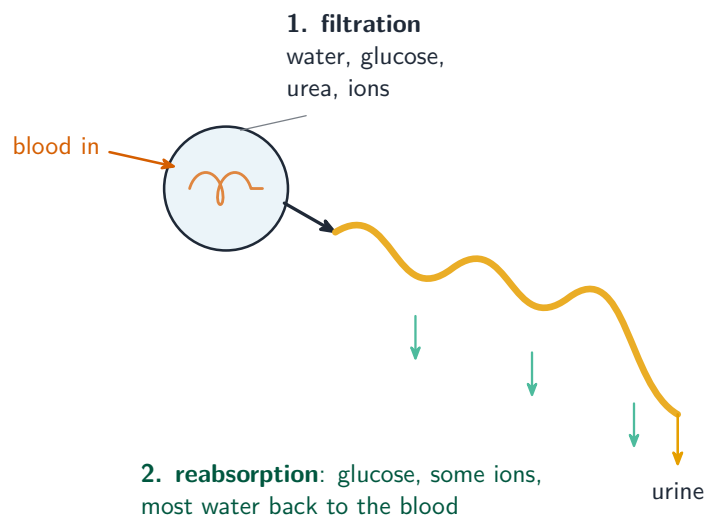
- define homeostasis and explain negative feedback
- describe how insulin and glucagon control blood glucose
- describe how the skin controls body temperature

1 Worked examples

■ Blood glucose control



Negative feedback keeps blood glucose near a set point



The kidney is a key homeostatic organ

- **insulin:** after a meal, liver stores glucose as glycogen (lowers glucose).
- **glucagon:** between meals, liver releases glucose (raises glucose).
- **too hot:** sweating + vasodilation; **too cold:** shivering + vasoconstriction.

2 Practice

2.1 Define homeostasis.

[1]

2.2 Name the hormone that lowers blood glucose.

[1]

3 Exam-style questions

3.1 When you are too hot, the blood vessels near the skin surface: [1]

- **A** narrow (vasoconstriction)
 - **B** widen (vasodilation)
 - **C** disappear
 - **D** stop carrying blood
-

3.2 Blood glucose is kept steady by negative feedback.

(a) Describe what happens after a meal raises blood glucose. [3]

(b) State what causes Type 1 diabetes. [1]

3.3 Explain how sweating helps cool the body. [2]

Solutions

2.1 keeping a constant internal environment inside the body.

2.2 insulin.

3.1 B. When too hot, the vessels widen (vasodilation) to lose more heat.

3.2 (a) the pancreas releases insulin; the liver takes up glucose and stores it as glycogen; so blood glucose falls back to normal.

(b) the pancreas cannot make insulin.

3.3 sweat evaporates from the skin; evaporation takes heat from the body, cooling it.