

4.1 Cell Communication

Name: _____ Class: _____ Date: _____

Total: 11 marks**KEY WORDS** receptor 受体 • signals 信号 • hormones 激素

Objective

Build the skills to answer exam questions on **cell communication**.

You must be able to:

- describe how cells communicate over short and long distances
- name the types of signaling (direct, local, long-distance)
- explain the roles of a **signal** and a **receptor** 受体

1 Worked examples

Study these first. Each one shows the method for a question type used later — follow the steps and you can do the Practice and Exam-style questions yourself.

■ Signals and receptors

Cells communicate using chemical **signals** (like hormones). A target cell has a specific **receptor** protein that binds the signal — only cells with the matching receptor respond.

■ Types of signaling by distance

- **Direct contact** — cells touch and exchange signals through junctions.
- **Local signaling** — a signal diffuses to nearby cells (e.g. neurotransmitters).
- **Long-distance signaling** — hormones travel through the blood to distant target cells.

■ Specificity

Only cells with the **correct receptor** respond to a signal, which is why a hormone affects some tissues but not others.

■ A worked example

Insulin (a hormone) travels in the blood (long-distance) and binds receptors on liver and muscle cells, which respond by taking up glucose.

2 Practice

Now apply the methods above.

2.1 What binds a chemical signal on the target cell? [1]

2.2 Name the three types of signaling by distance. [3]

2.3 Why does a hormone affect only some cells? [1]

3 Exam-style questions

3.1 Only cells that respond to a particular signal have the correct [1]

A	B
C	D

A enzyme

B receptor

C ribosome

D membrane

3.2 Insulin travels in the blood to reach liver and muscle cells.

(a) Name this type of signaling. [1]

(b) Explain why insulin affects these cells but not others. [2]

3.3 Explain the difference between local and long-distance signaling. [2]