Exercise walk-through

Mechanisms of Transport ▪ 2.8

eXercise

You must be able to

- describe **endocytosis** 内吞 and **exocytosis** 外排
- distinguish phagocytosis from pinocytosis
- explain that bulk transport uses vesicles and ATP

Method — Bulk transport with vesicles

Large materials cross the membrane in **vesicles**, using energy (**ATP**):

- **Endocytosis** — the membrane folds inward to bring material **in**.
- **Exocytosis** — a vesicle fuses with the membrane to release material **out**.

Method — Types of endocytosis

- **Phagocytosis** (“cell eating”) — engulfing large particles or cells.
- **Pinocytosis** (“cell drinking”) — taking in droplets of fluid.

Method — A worked example

A white blood cell **phagocytoses** (engulfs) a bacterium into a vesicle to destroy it — endocytosis. A gland cell releases hormones by **exocytosis**.

Method — Why it needs energy

Reshaping the membrane and moving vesicles requires **ATP**, so bulk transport is an active process.

Practice 2.1 ▪ 1 mark

Which process brings material into the cell in a vesicle?

Solution 2.1

Worked steps

Endocytosis B1.

Practice 2.2 ▪ 2 marks

Distinguish phagocytosis from pinocytosis.

Solution 2.2

Method: Types of endocytosis

Worked steps

Phagocytosis engulfs large solid particles/cells; pinocytosis takes in fluid droplets B1 B1.

Practice 2.3 ▪ 1 mark

Does bulk transport require ATP?

Solution 2.3

Worked steps

Yes B1.

Exam-style 3.1 ▪ 1 mark

A vesicle fusing with the membrane to release its contents is

A endocytosis

B exocytosis

C diffusion

D osmosis

Solution 3.1

Method: Bulk transport with vesicles

A endocytosis

B exocytosis ✓

C diffusion

D osmosis

Worked steps

B — exocytosis.

Exam-style 3.2 ▪ 1 mark

A white blood cell engulfs a bacterium.
(a) Name the process.
(b) Explain why this requires energy.

Solution 3.2

Method: A worked example

Worked steps

(a) Phagocytosis (endocytosis) B1. (b) The membrane must reshape and form a vesicle to engulf the bacterium, which requires ATP M1 A1.

Exam-style 3.3 ▪ 2 marks

A gland cell releases insulin made inside it. Describe how the insulin leaves the cell.

Solution 3.3

Method: A worked example

Worked steps

The insulin is packaged in a vesicle that moves to and fuses with the cell membrane, releasing the insulin outside by exocytosis M1 A1.