AP BIOLOGY • EXERCISE SHEET

2.8 Mechanisms of Membrane Transport

Name: _____ Class: _____ Date: _____ **Total: 10 marks**

Objective

Build the skills to answer exam questions on **mechanisms of bulk membrane transport**.

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

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.

■ 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**.

■ Types of endocytosis

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

■ 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**.

■ Why it needs energy

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

2 Practice

Now apply the methods above.

2.1 Which process brings material into the cell in a vesicle? [1]

2.2 Distinguish phagocytosis from pinocytosis. [2]

2.3 Does bulk transport require ATP? [1]

3 Exam-style questions

3.1 A vesicle fusing with the membrane to release its contents is [1]

- **A** endocytosis
- **B** exocytosis
- **C** diffusion
- **D** osmosis

3.2 A white blood cell engulfs a bacterium.

(a) Name the process. [1]

(b) Explain why this requires energy. [2]

3.3 A gland cell releases insulin made inside it. Describe how the insulin leaves the cell. [2]

4 Go further

You are now ready for the real exam questions on this subtopic:

- work through the **2.8 Mechanisms of Membrane Transport** lesson on the **Learn** page;
- read the **Mechanisms of Membrane Transport** section of the AP Biology handout on the **Know** page.

Solutions

2.1 Endocytosis.

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

2.3 Yes.

3.1 B —exocytosis.

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

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