

APOLLO

Organelles and compartmentalization

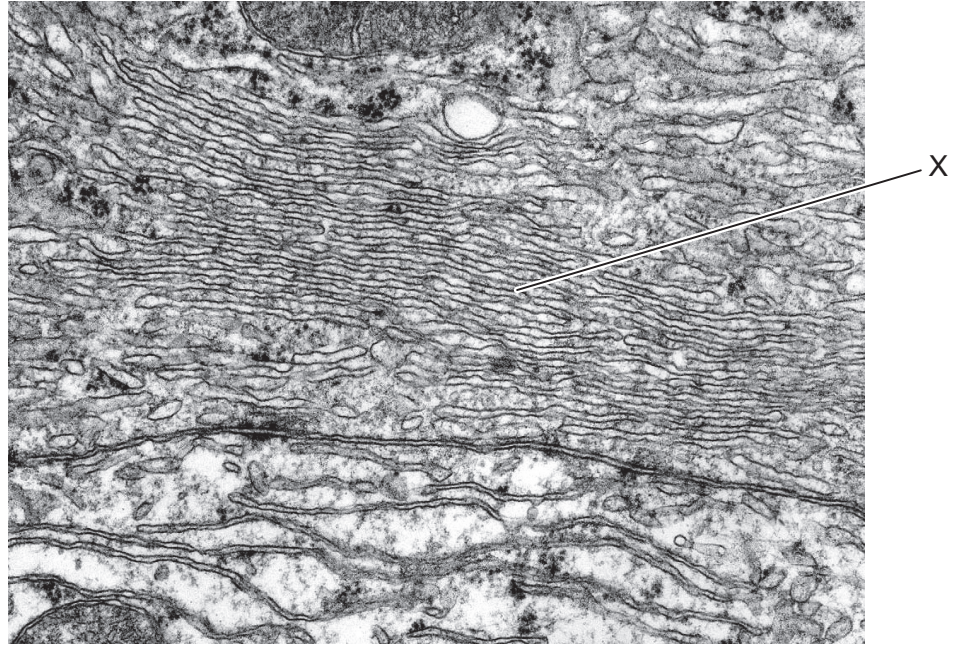
HL

Biology

First assessment 2025

4 questions | questions

13. The electron micrograph shows part of a eukaryotic cell.



What is the organelle labelled X?

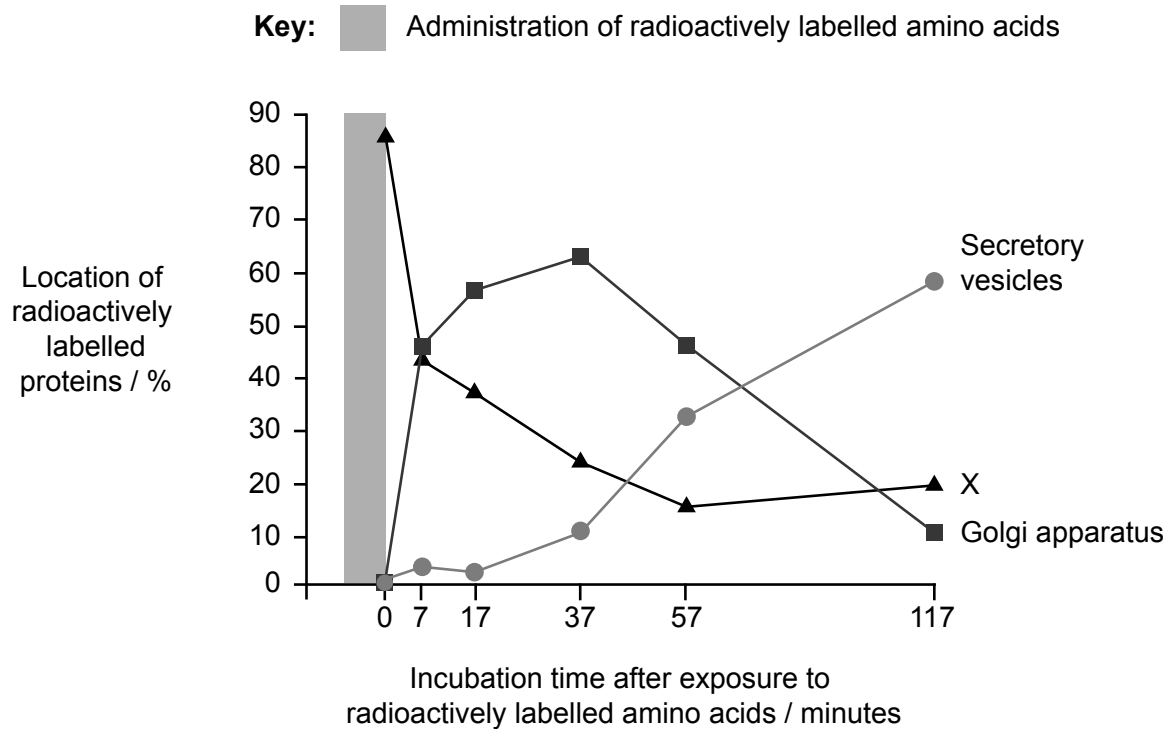
- A. Mitochondrion
- B. Smooth endoplasmic reticulum
- C. Lysosome
- D. Nucleus

- 16.** Eukaryotic cells have membrane-bound organelles. What is a property of one of these organelles?
- A. The rough endoplasmic reticulum synthesises lipids for use outside the cell.
 - B. The nucleus has a double membrane to allow vesicle formation for intracellular transport.
 - C. The mitochondrion has enzymes and substrates of the Krebs cycle compartmentalized in the matrix.
 - D. The Golgi apparatus uses ribosomes to synthesise proteins for export from the cell.

- 16.** What is a benefit of double membranes surrounding the nuclei of eukaryotic cells?
- A. They reduce the surface area of the nucleus.
 - B. They can easily break down into vesicles during mitosis.
 - C. Hydrophilic phospholipid tails can be kept away from the cytoplasm.
 - D. Pores are formed to allow movement of DNA from the nucleus to the cytoplasm.

2. In an experiment investigating the secretion of proteins by gland cells, researchers supplied radioactively labelled amino acids to a sample of pancreas cells that secrete digestive enzymes.

The graph shows the relative abundance of radioactively labelled proteins in three different organelles during the period after the cells were exposed to the radioactively labelled amino acids.



- (a) Suggest a reason for using amino acids that were radioactively labelled. [1]

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- (b) (i) X is a membrane-bound organelle. Identify X. [1]

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(Question 2 continued)

(ii) Explain the role of ribosomes located on X.

[2]

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(iii) Outline the evidence provided by the data that molecules containing radioactively labelled amino acids move from X to the Golgi apparatus.

[1]

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(c) Gland cells that secrete large volumes of fluid typically have many aquaporins in their plasma membranes. Suggest a reason for this.

[1]

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(d) After synthesis, globular proteins assume their final tertiary structure. Explain the relationship between the sequence of amino acids and the tertiary structure of globular proteins.

[4]

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Turn over