



ANSWER BOOK

Cell structure: what each organelle is shaped for

Cells, microscopy and biological organisation · Unit B01

AQA 3.2.1.1 · OCR A 2.1.1 (d)–(f) · Edexcel A Topic 3.1–3.5 · CAIE 1.2

5 questions · 16 marks

NAVY EDITION

SECTION A · Short, 1 to 2 marks

- A1** **B1** synthesises lipids, phospholipids or steroids; storing calcium ions also [2]
accepted. **B1** smooth endoplasmic reticulum has no ribosomes attached to its surface,
whereas rough endoplasmic reticulum does.
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SECTION B · Standard, 3 to 5 marks

- B1** **B1** both are surrounded by two membranes, but a chloroplast has a separate [4]
internal thylakoid membrane system as well. **B1** the inner mitochondrial membrane is
folded into cristae, whereas the chloroplast membranes form thylakoids stacked into
grana. **B1** the fluid interior of a mitochondrion is the matrix, where the Krebs cycle runs,
whereas that of a chloroplast is the stroma, holding the enzymes of the
light-independent reactions. **B1** a chloroplast contains chlorophyll in its thylakoid
membranes, whereas a mitochondrion contains no pigment.
- B2** **B1** a lysosome holds hydrolytic enzymes, which digest worn-out organelles [4]
and material taken in by phagocytosis. **B1** loose in the cytoplasm those enzymes would
hydrolyse the cell that made them, so they are released only where they are wanted. **B1**
the enzymes are proteins, made on ribosomes attached to the rough endoplasmic
reticulum. **B1** they are packaged at the Golgi apparatus, and a lysosome is simply a
vesicle budded from it and kept rather than secreted.
- B3** **B1** a stack of flattened membrane sacs, usually four to eight, with vesicles [3]
budding from one face. **B1** vesicles carrying newly made protein arrive at one side and
the contents move through the stack. **B1** the protein is modified, for example by having
sugar groups added to make a glycoprotein, then sorted and packaged into a vesicle
addressed to its destination.
- B4** **B1** smooth endoplasmic reticulum is the site of lipid and steroid synthesis. **B1** a [3]
large area of smooth endoplasmic reticulum allows the cell to make steroid hormone
in quantity. **B1** the cell exports very little protein, so few attached ribosomes and
therefore little rough endoplasmic reticulum are needed.
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