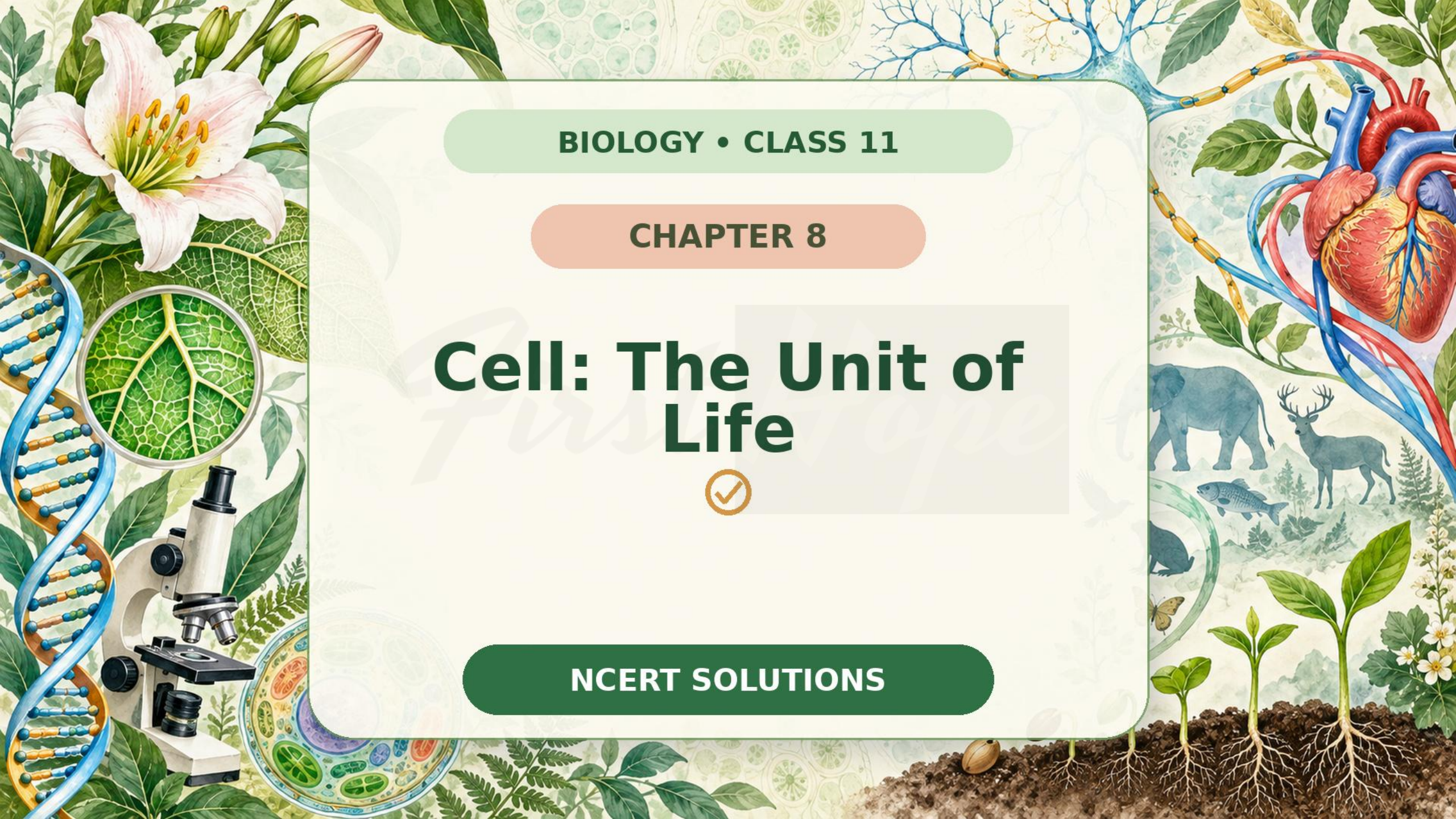


A vibrant collage of biological illustrations. On the left, a pink lily flower is in bloom, with green buds and leaves. Below it, a blue and orange DNA double helix is visible. A magnifying glass focuses on a green leaf's vein structure. A microscope is positioned in the lower-left corner. On the right, a detailed human heart with red and blue blood vessels is shown. Below the heart, there are illustrations of a blue elephant, a deer, a fish, and a frog. At the bottom, a small green plant with roots is growing out of brown soil. The background is filled with various green leaves and botanical patterns.

BIOLOGY • CLASS 11

CHAPTER 8

Cell: The Unit of Life



NCERT SOLUTIONS

EXERCISE SOLUTIONS: QUESTIONS 1-2

1. Which is not correct?

- (a) Robert Brown discovered the cell.
- (b) Schleiden and Schwann formulated the cell theory.
- (c) Virchow explained that cells arise from pre-existing cells.
- (d) A unicellular organism carries out its life activities within one cell.

Answer: (a)

Robert Hooke discovered and named cells in cork. Robert Brown discovered the nucleus.

2. New cells generate from:

- (a) bacterial fermentation
- (b) regeneration of old cells
- (c) pre-existing cells
- (d) abiotic materials.

Answer: (c) pre-existing cells

Virchow expressed this principle as *Omnis cellula e cellula*.

EXERCISE SOLUTIONS: QUESTIONS 3-4

3. Match Column I with Column II.

Column I:

- (a) Cristae
- (b) Cisternae
- (c) Thylakoids

Column II:

- (i) Flat membranous sacs in stroma
- (ii) Infoldings in mitochondria
- (iii) Disc-shaped sacs in Golgi apparatus.

Answer:

- (a) → (ii) Cristae—infoldings of inner mitochondrial membrane
- (b) → (iii) Cisternae—disc-shaped sacs of Golgi apparatus
- (c) → (i) Thylakoids—flat membranous sacs in chloroplast stroma.

4. Which is correct?

- (a) All living cells have a nucleus.
- (b) Animal and plant cells both have a well-defined cell wall.
- (c) Prokaryotes have no membrane-bound organelles.
- (d) Cells form de novo from abiotic materials.

Answer:

- (c)** Prokaryotes lack a membrane-bound nucleus and membrane-bound cell organelles.

EXERCISE SOLUTIONS: QUESTIONS 5-6

5. What is a mesosome in a prokaryotic cell?
Mention its functions.

Answer:

In the historical NCERT description, a mesosome is an infolding of the bacterial plasma membrane. It was assigned roles in cell-wall formation, DNA replication and distribution, respiration, secretion, and increasing membrane surface area.

Modern electron microscopy shows that classical mesosomes are mainly artefacts produced during chemical fixation, not normal bacterial organelles.

6. How do neutral solutes cross the plasma membrane? Do polar molecules move in the same way? If not, how are they transported?

Answer:

Neutral solute: higher concentration → simple diffusion through lipid bilayer → lower concentration; no ATP.

Polar molecule: usually cannot cross the hydrophobic lipid bilayer freely → channel or carrier protein.

Facilitated diffusion moves down a gradient without ATP; active transport moves against a gradient using energy.

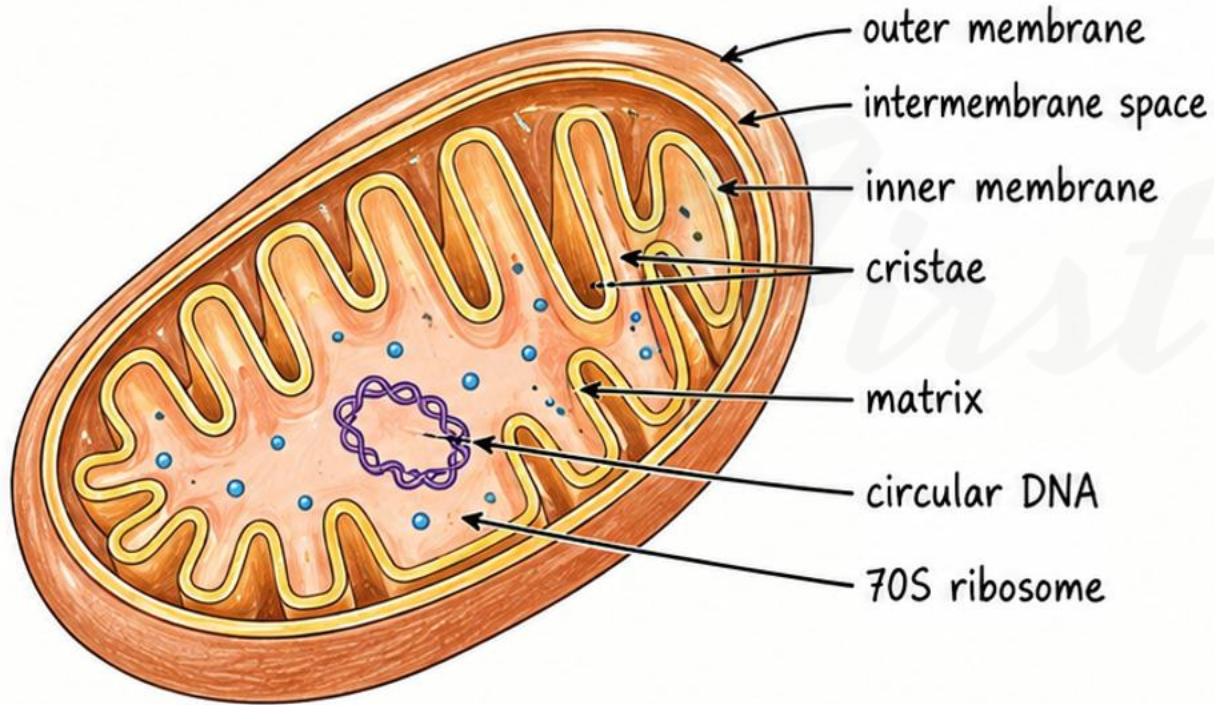
Water moves by osmosis, often through aquaporins.

EXERCISE SOLUTION: QUESTION 7

7. Name two double-membrane-bound organelles. State their characteristics and functions, and draw labelled diagrams.

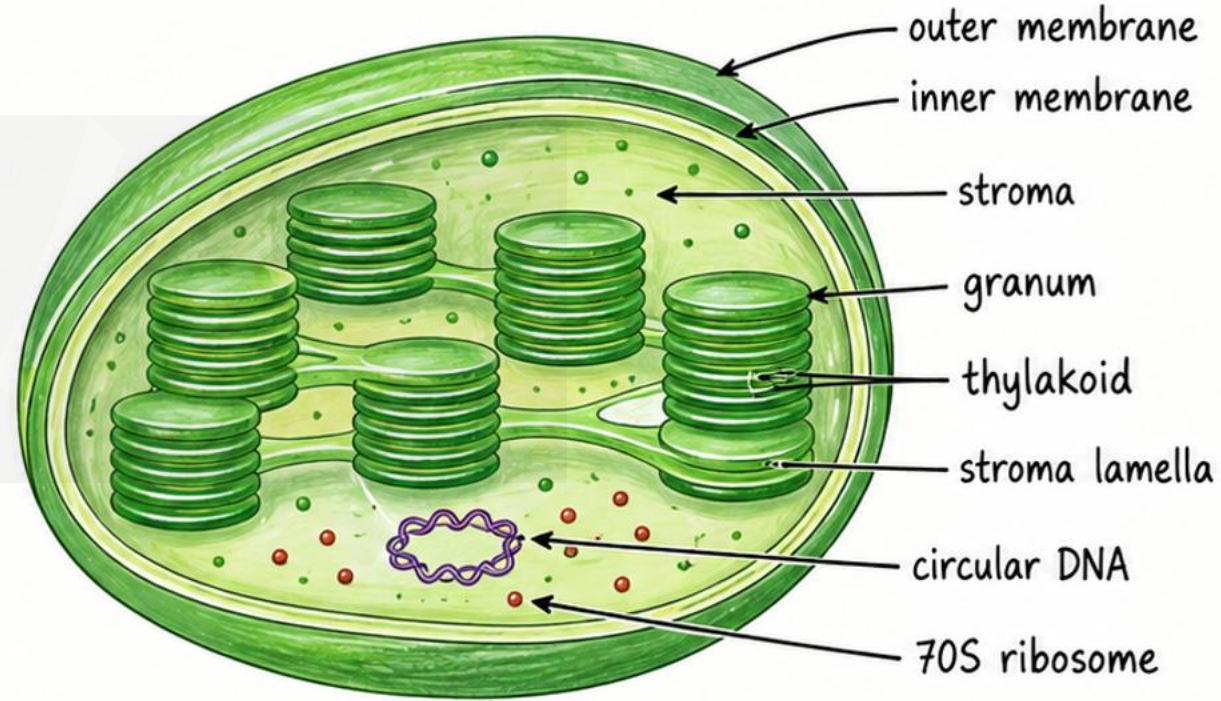
Answer:

MITOCHONDRION



- Semiautonomous organelle with its own DNA and ribosomes.
- Site of aerobic respiration and ATP formation.

CHLOROPLAST



- Semiautonomous plastid containing chlorophyll in thylakoid membranes.
- Light reactions occur on thylakoids; carbon fixation occurs in stroma.

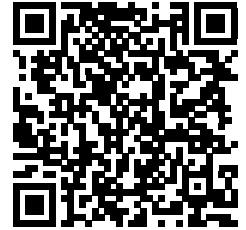


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