

Lecture Series on Biochemistry (Part 6)



Membrane transport

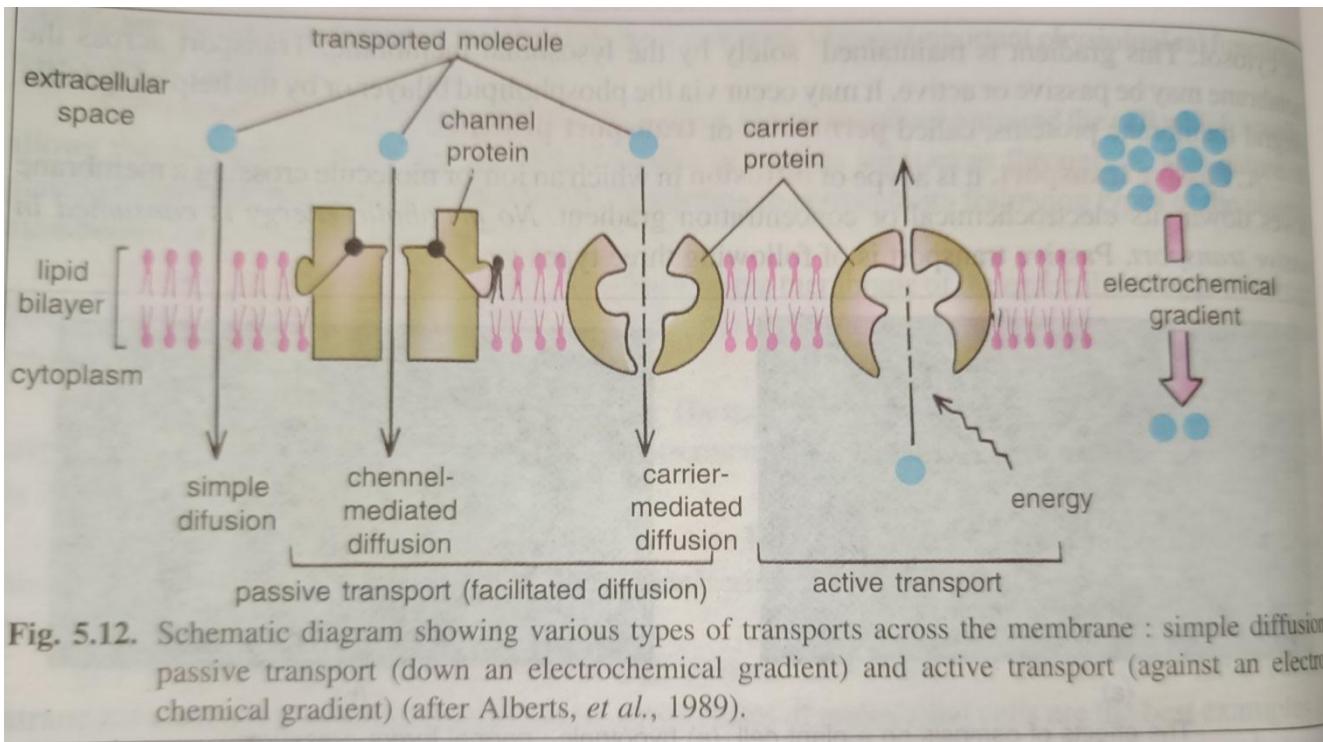


Fig. 5.12. Schematic diagram showing various types of transports across the membrane : simple diffusion, passive transport (down an electrochemical gradient) and active transport (against an electrochemical gradient) (after Alberts, *et al.*, 1989).

Membrane transport

- Plasma membrane is highly selective.
- This ensures that only essential molecules such as glucose, amino acids and lipids can readily enter the cell and that these molecules and metabolic intermediates remain within the cell and the waste compounds leave the cell.

Mode of transport across Plasma Membrane

- Passive transport
- Active transport

Passive transport

- Osmosis
- Simple diffusion
- Facilitated diffusion

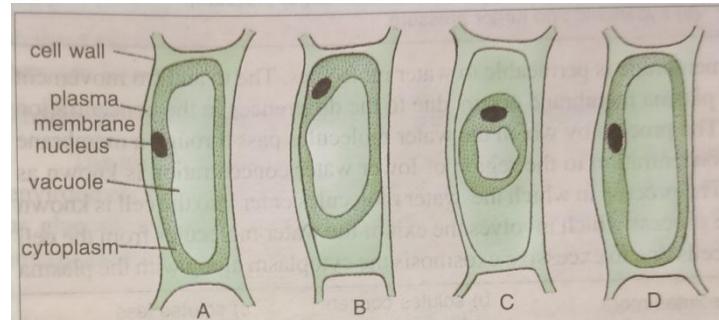
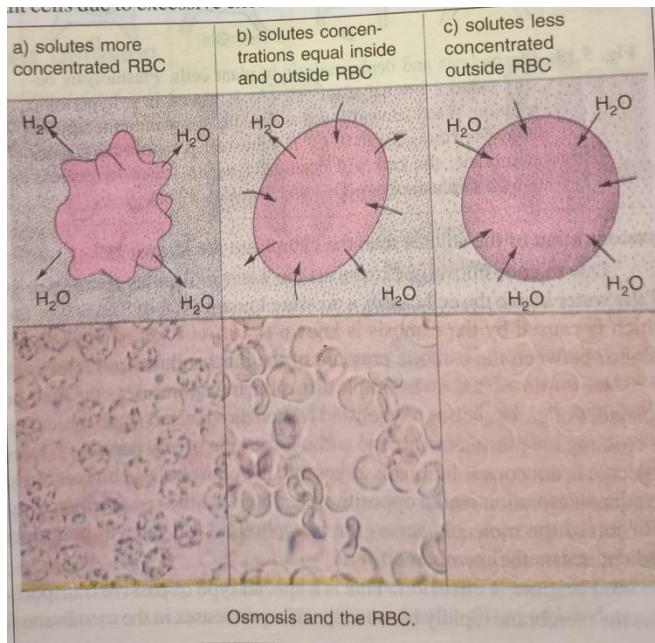
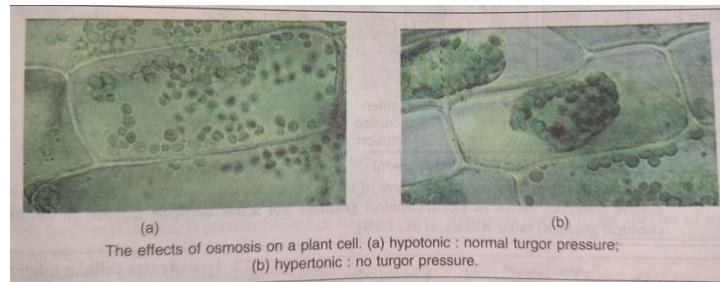


Fig. 5.13. Plasmolysis and deplasmolysis in plant cells. Plasmolysis occurs when a normal plant cell (A) is placed in a hypertonic solution. Water leaves the cell and the plasma membrane shrinks away from the cell wall (B,C). If solutes can penetrate the plasma membrane, the cell will eventually regain water—a process termed deplasmolysis (D) (after De Witt, 1977).



Active transport

- Sodium potassium ATPase
- Proton pump

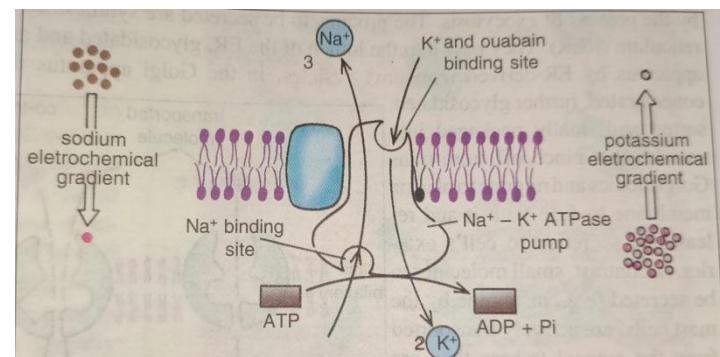
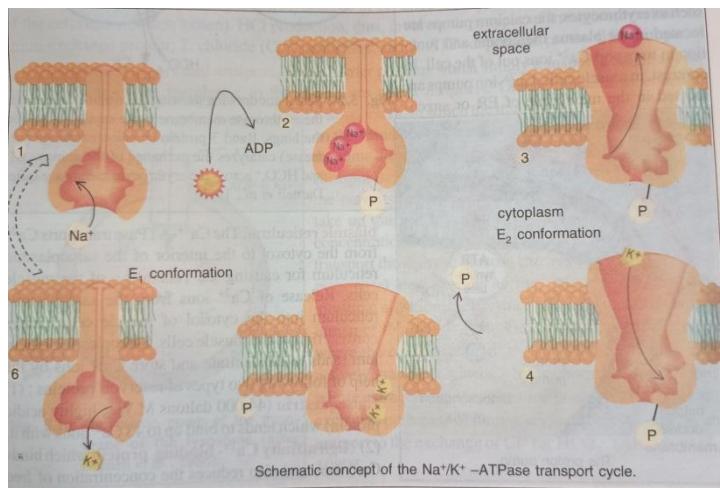


Fig. 5.15. The Na^+/K^+ -ATPase in the plasma membrane actively pumps Na^+ out and K^+ into a cell against their electrochemical gradients. For every molecule of ATP hydrolyzed inside the cell, 3 Na^+ ions are pumped out and 2 K^+ ions are pumped in (after Alberts *et al.*, 1989).

