Plasma Membrane Components

- Phospholipids: form a fluid bilayer
- Proteins: integral and peripheral
  - Functional properties (transport, enzymes, etc.)
- Carbohydrates: form glycolipids, glycoproteins
  - Cell communication and recognition

Figure 8.2 Two generations of membrane models

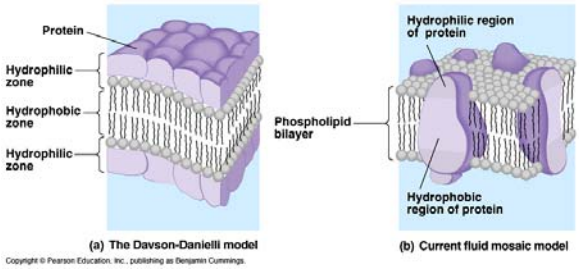


Figure 8.6 The detailed structure of an animal cell's plasma membrane, in cross

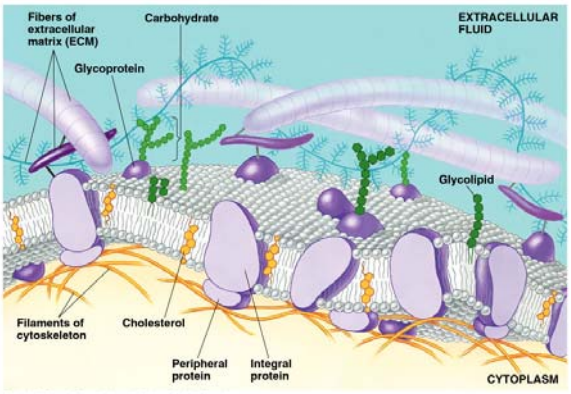


Figure 8.7 The structure of a transmembrane protein

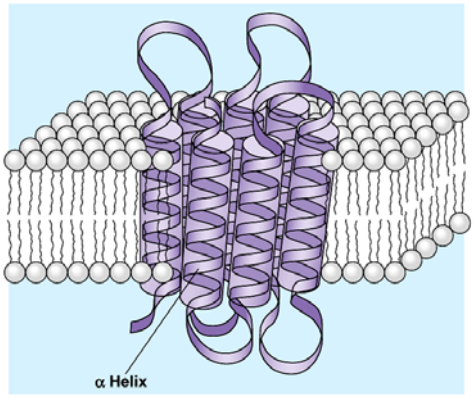


Figure 8.8 Sidedness of the plasma membrane

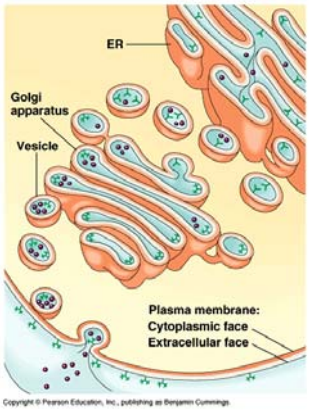
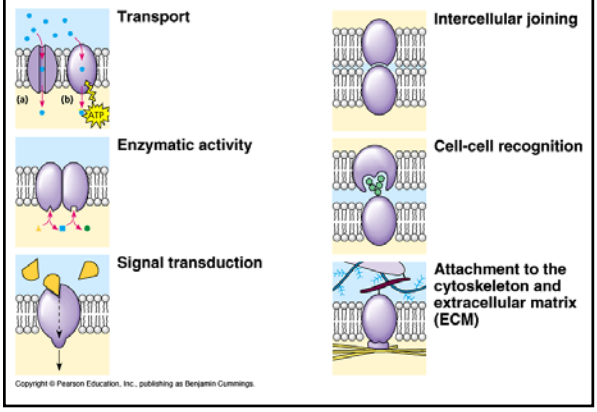


Figure 8.9 Some functions of membrane proteins



Passive Transport

- Always follows electrochemical gradient
- Does not require energy input
- Includes:
  - Simple diffusion
  - Osmosis: diffusion of water across a semi-permeable membrane
  - Facilitated diffusion

Figure 8.10 The diffusion of solutes across membranes

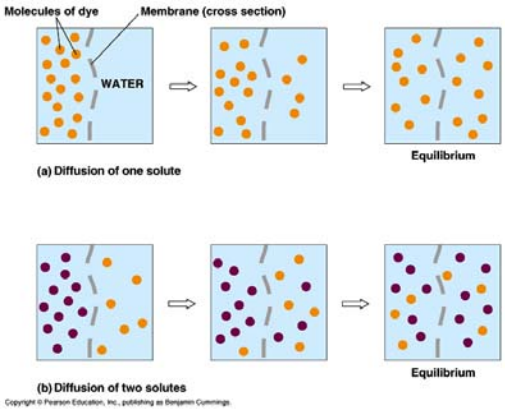


Figure 8.11 Osmosis

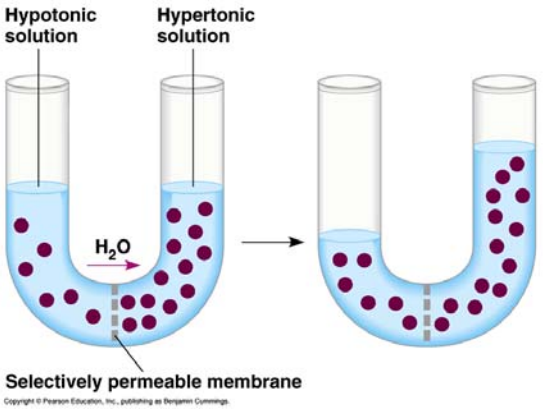


Figure 8.12 The water balance of living cells

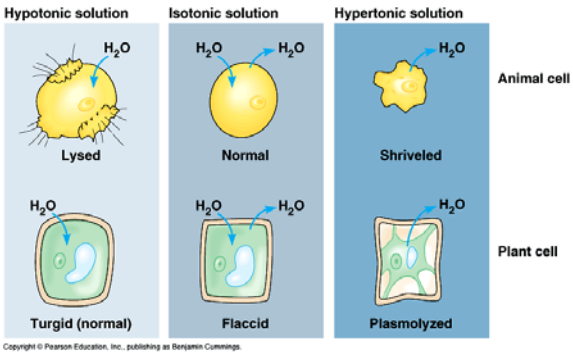
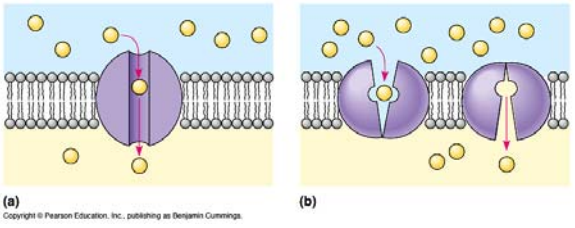


Figure 8.14 Two models for facilitated diffusion



Active Transport

- Goes against electrochemical gradient
- Requires energy input
- Includes:
  - Sodium-potassium pump
  - Proton pump in plants
  - Cotransport

Figure 8.15 The sodium-potassium pump: a specific case of active transport

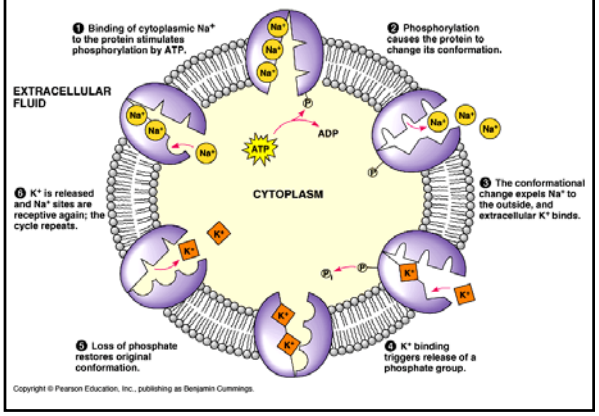


Figure 8.17 An electrogenic pump

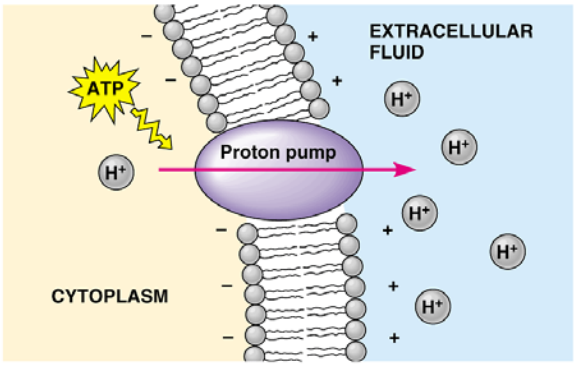


Figure 8.18 Cotransport

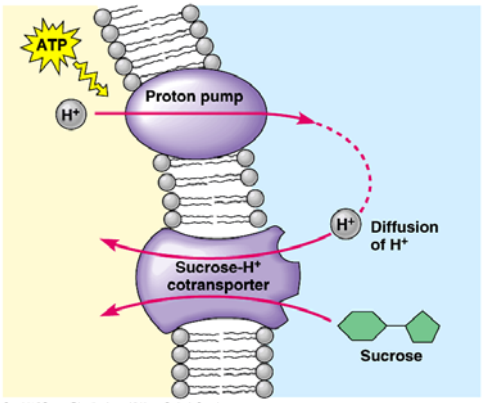
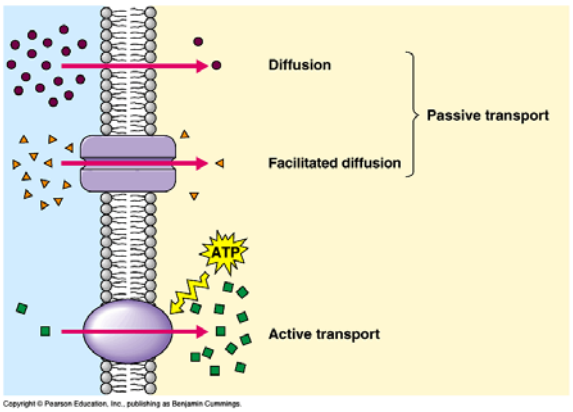


Figure 8.16 Review: passive and active transport compared



Bulk Transport

- Exocytosis: cell contents released to outside
- Endocytosis: materials brought into cell
  - Phagocytosis: cell "eating"
  - Pinocytosis: cell "drinking"
  - Receptor-mediated endocytosis: can increase concentrations inside cell

Figure 8.19 The three types of endocytosis in animal cells