CHAPTER 5

SUMMARY

Cells in Their Environment

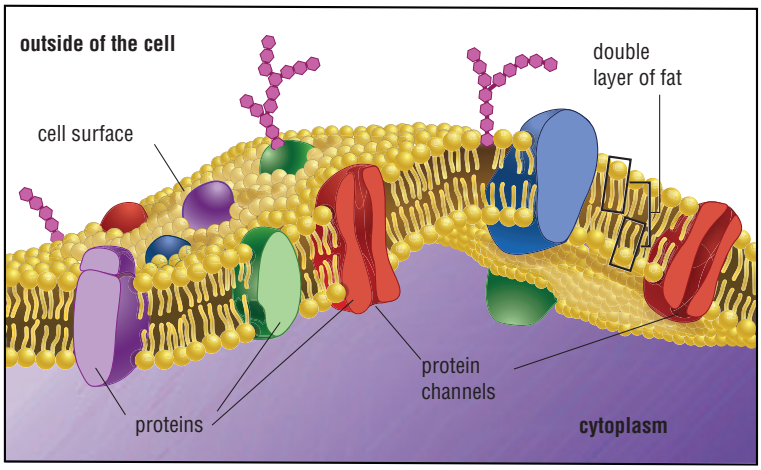
BIG Ideas

- [x] Cells are the basis of life.
- [ ] Cells organize into tissues, tissues into organs, organs into organ systems, and organ systems into organisms.
- [x] Healthy cells contribute to healthy organisms.
- [ ] Systems are interdependent.

Looking Back

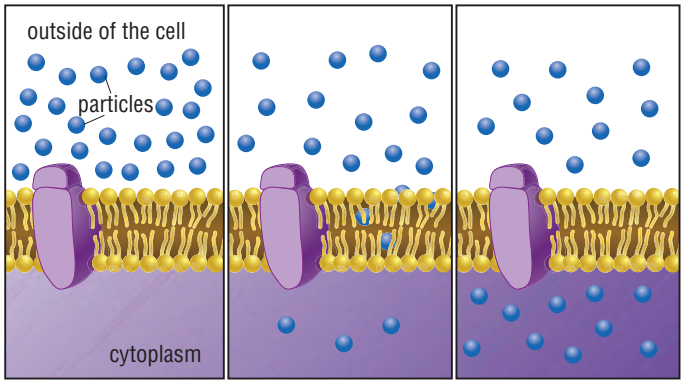
The cell membrane is a selectively permeable membrane. It regulates the movement of substances into and out of the cell.

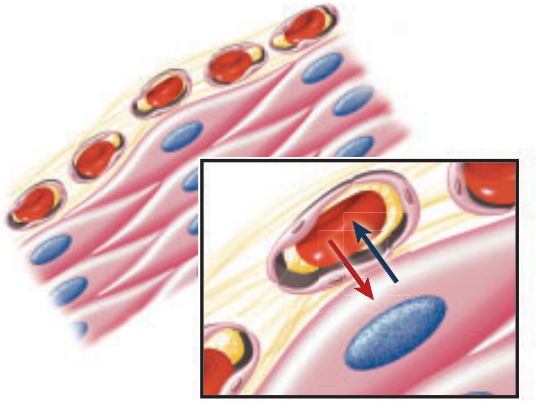
- The cell membrane acts as a gateway for substances to move into and out of cells. It is selectively permeable.
- The cell membrane blocks harmful substances from entering the cell and removes wastes.
- The cell membrane is composed of two layers of fat particles with proteins embedded within it. Some of these proteins act as channels through which substances can enter or leave the cell.



Diffusion is one of the basic ways that substances move into and out of cells.

- The difference in concentration between two areas is called a concentration gradient.
- Diffusion occurs down a concentration gradient, moving particles from an area of higher concentration to an area of lower concentration.
- Living things depend on diffusion to move substances into and out of the cell.



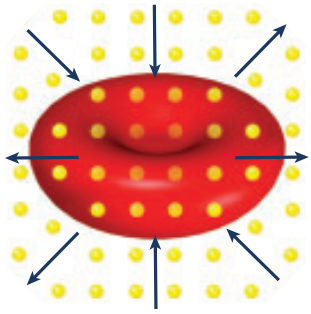


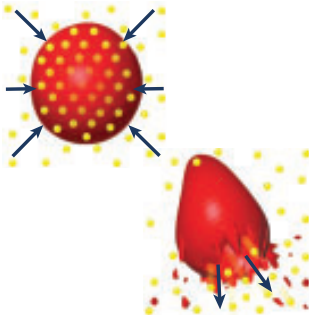
Osmosis moves water into and out of cells.

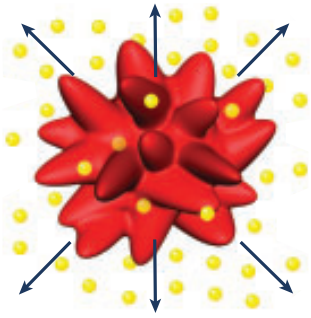
- Osmosis is a special type of diffusion involving the diffusion of water across a selectively permeable membrane. Water molecules move into or out of a cell until the concentration of water molecules on both sides of the membrane is equal.
- Plant cells depend on osmosis to maintain turgor pressure.
- Cells can be damaged or killed if too much water diffuses into or out of them. Cell walls protect plant cells by preventing the turgor pressure from becoming high enough to burst cells.

VOCABULARY

selectively permeable membrane, p. 120
diffusion, p. 121
concentration gradient, p. 122
osmosis, p. 124
turgor pressure, p. 126
endocytosis, p. 132
phagocytosis, p. 132
exocytosis, p. 133







The skills of scientific inquiry can be used to conduct controlled experiments on diffusion and osmosis.

- Diffusion across a selectively permeable membrane can be modelled using dialysis tubing.
- Dialysis tubing can be used to observe osmosis.

Cells use special processes to move non-dissolved particles, or large amounts of material, into and out of the cytoplasm.

- Cells use endocytosis to move undissolved substances into the cell.
- Cells use exocytosis to move undissolved substances out of the cell.
- Endocytosis and exocytosis are vital processes for cells when they need to move substances too big to diffuse through their cell membranes.