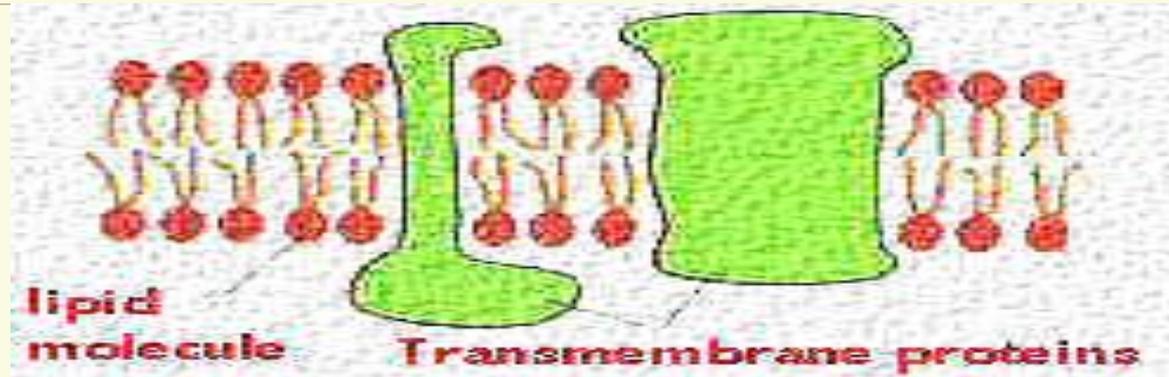
A spiral-bound notebook with a light brown, textured cover. The spiral binding is on the left side. The text is centered on the cover.

The Cell Membrane

Structure, Function, and Transport

Cell Membrane Structure



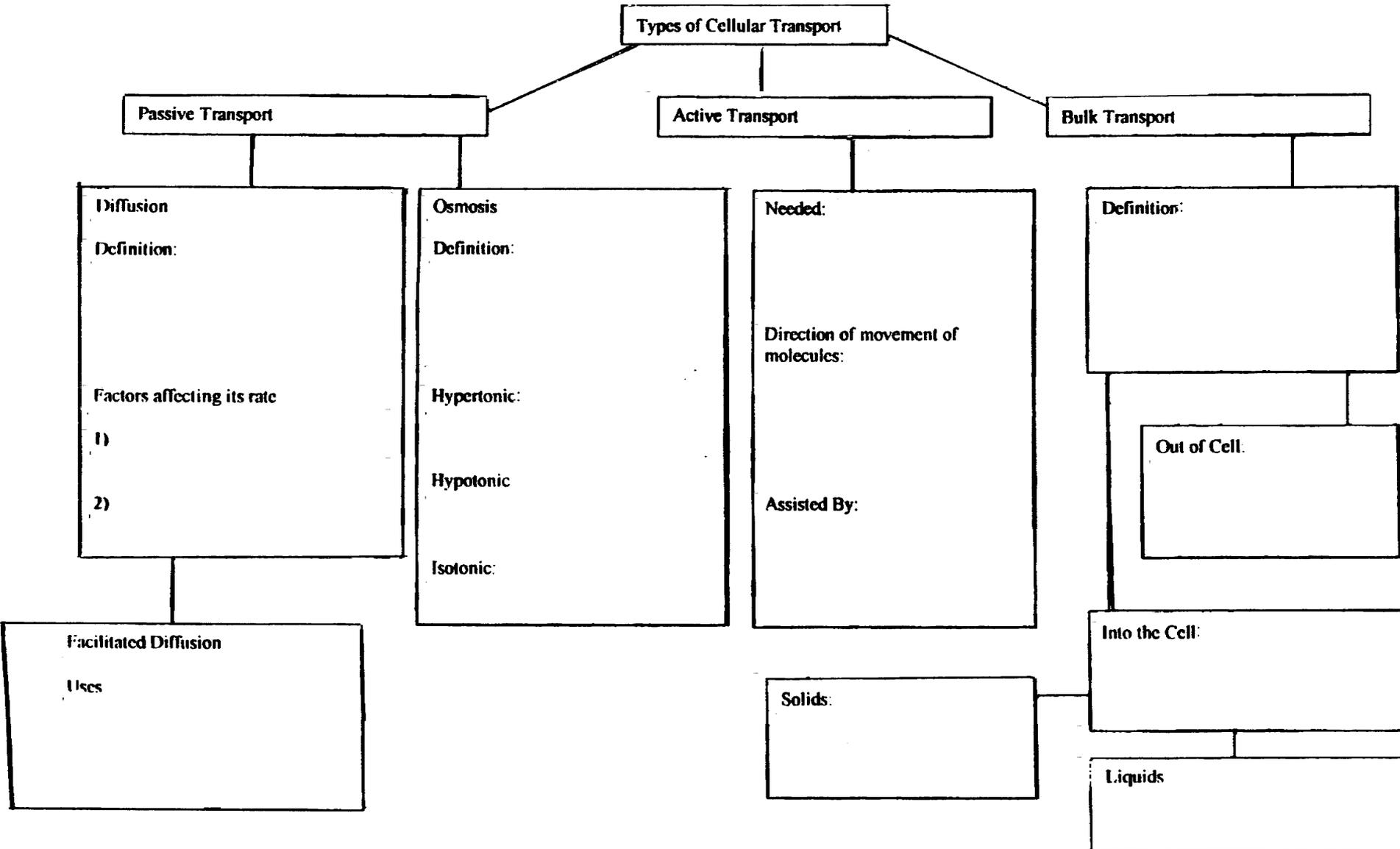
What is the main function of the cell membrane?

What structures make up the cell membrane?

Why is the cell membrane called semi-permeable?

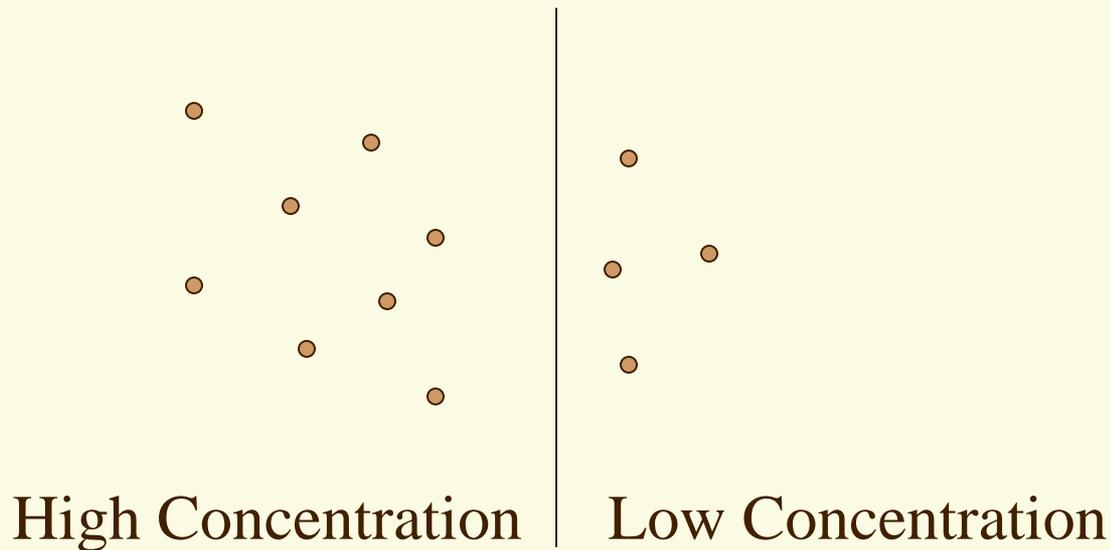
How do molecules pass through the cell membrane?

Crossing the Membrane: Cell Transport



What is a concentration gradient?

The difference between the concentration of a molecule in one area and the concentration in an adjacent area.



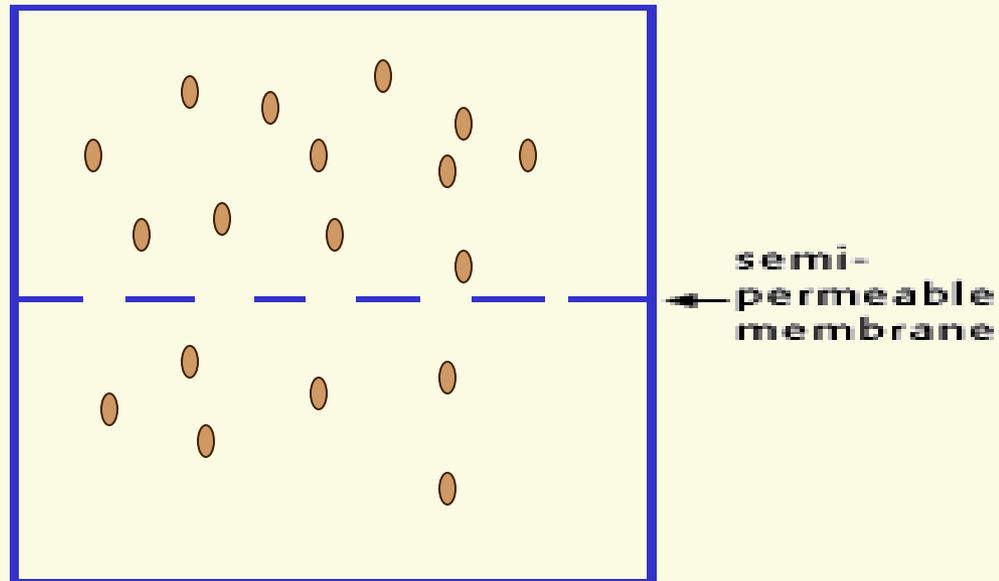
Passive Transport

- ☞ Molecules go from an area of high concentration to low concentration.
- ☞ Down the concentration gradient.
- ☞ Examples: Diffusion, Osmosis, and Facilitated diffusion.

Diffusion

Movement of molecules from an area of high concentration to an area of low concentration.

Diffusion across a membrane



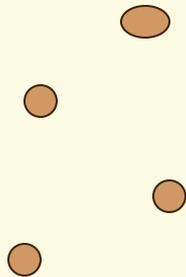
Factors affecting its rate

 Temperature

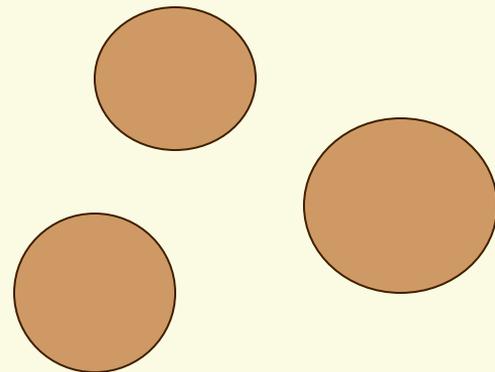
Hot = Faster

Cold = Slower

 Size



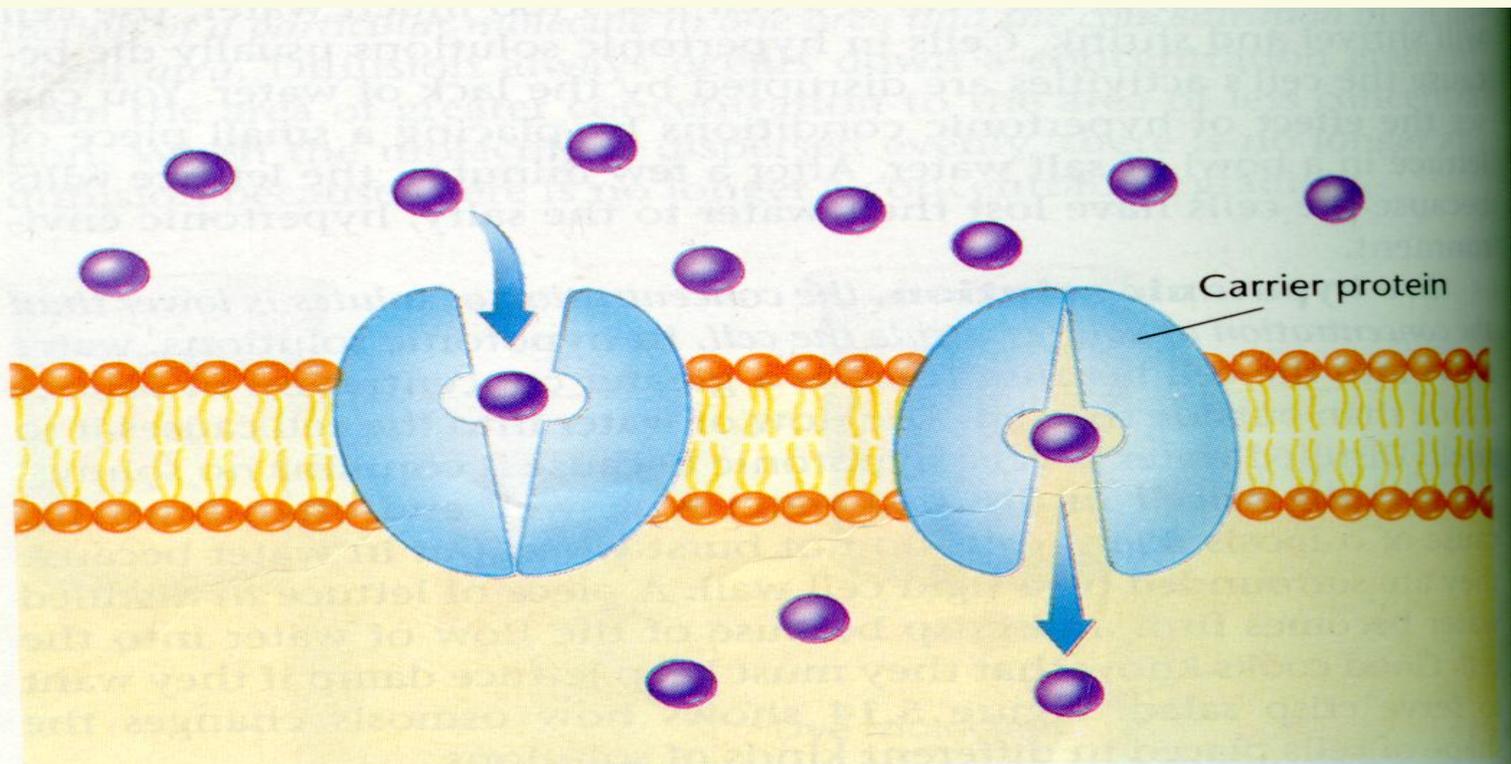
Diffuse faster



Diffuse slower

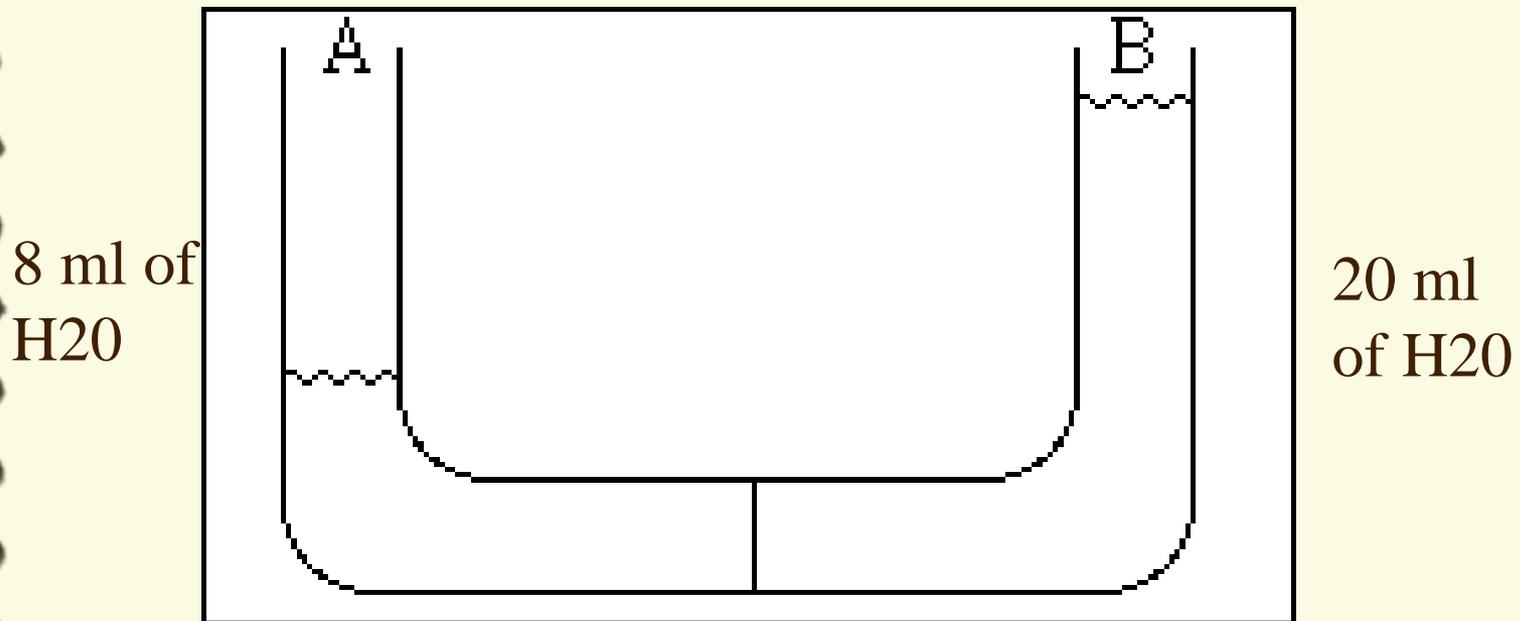
Facilitated Diffusion

The use of carrier proteins for diffusion.



Osmosis

The diffusion of water from an area of high concentration of water to an area of low concentration of water until equal on both sides.

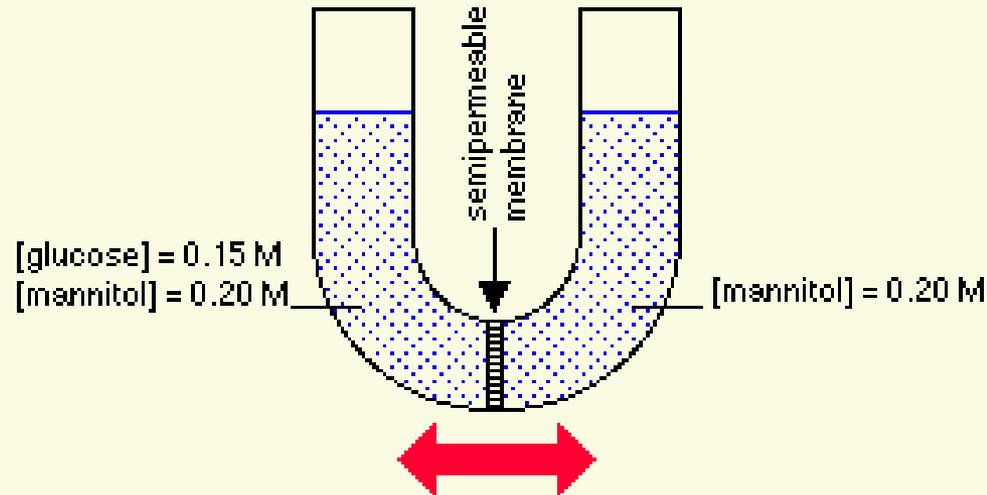


In which direction will the water move?

Osmosis and Solute concentration

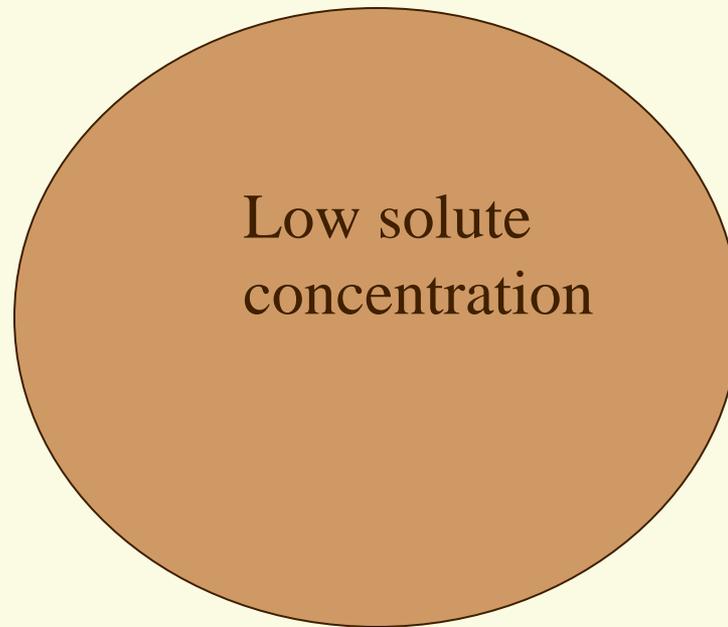
A **solute** is any molecule that is dissolved in water.

Water moves from an area of low solute concentration to an area of high solute concentration until equal on both sides.



Hypertonic solutions

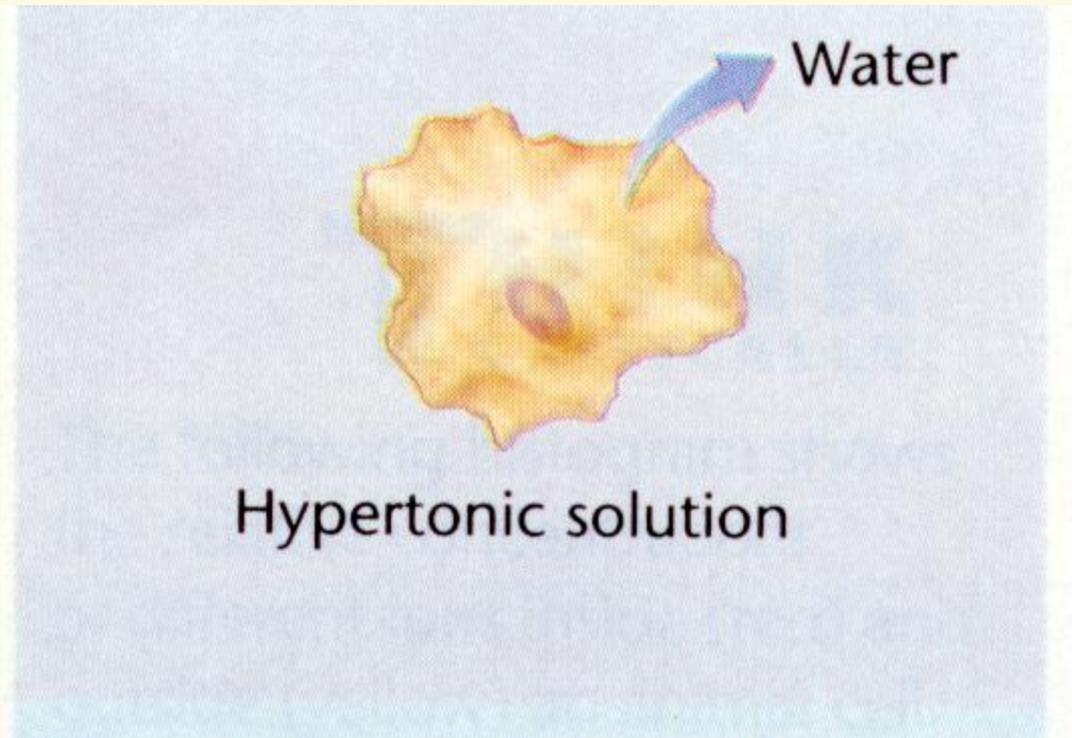
The concentration of solutes outside the cell is higher than the concentration of solutes inside the cell.



High solute concentration

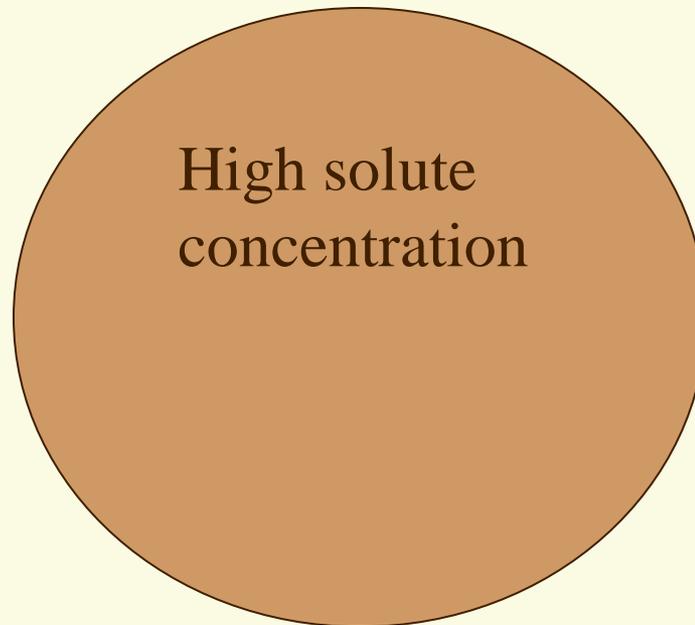
What will happen to the above cell?

The cell shrivels and shrinks.



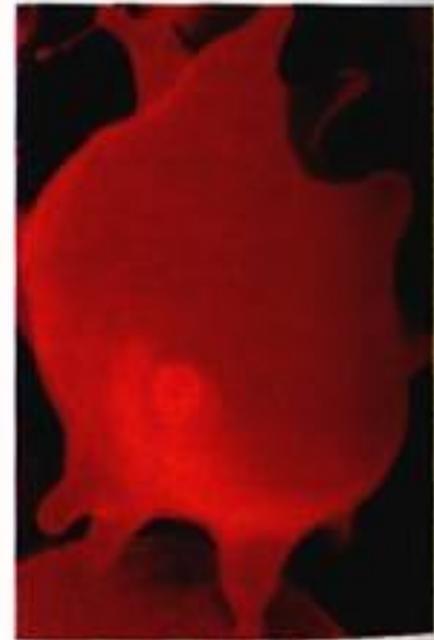
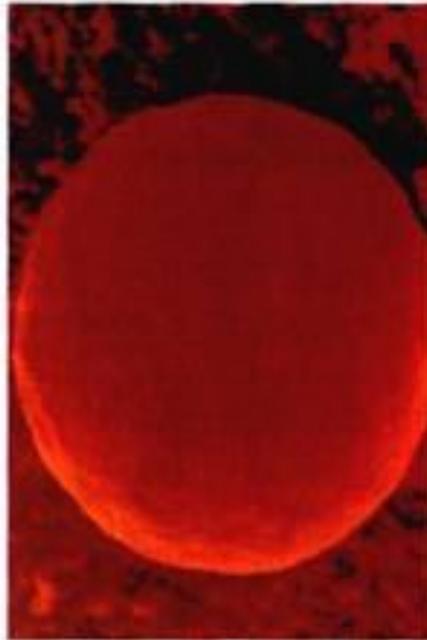
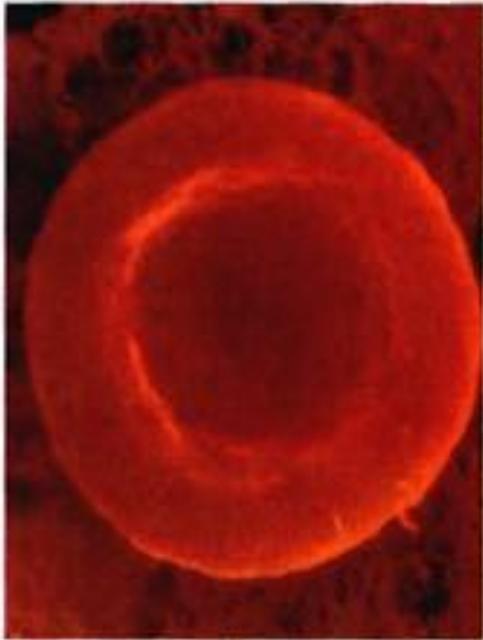
Hypotonic Solution

The concentration of solutes is lower outside of the cell than inside the cell.



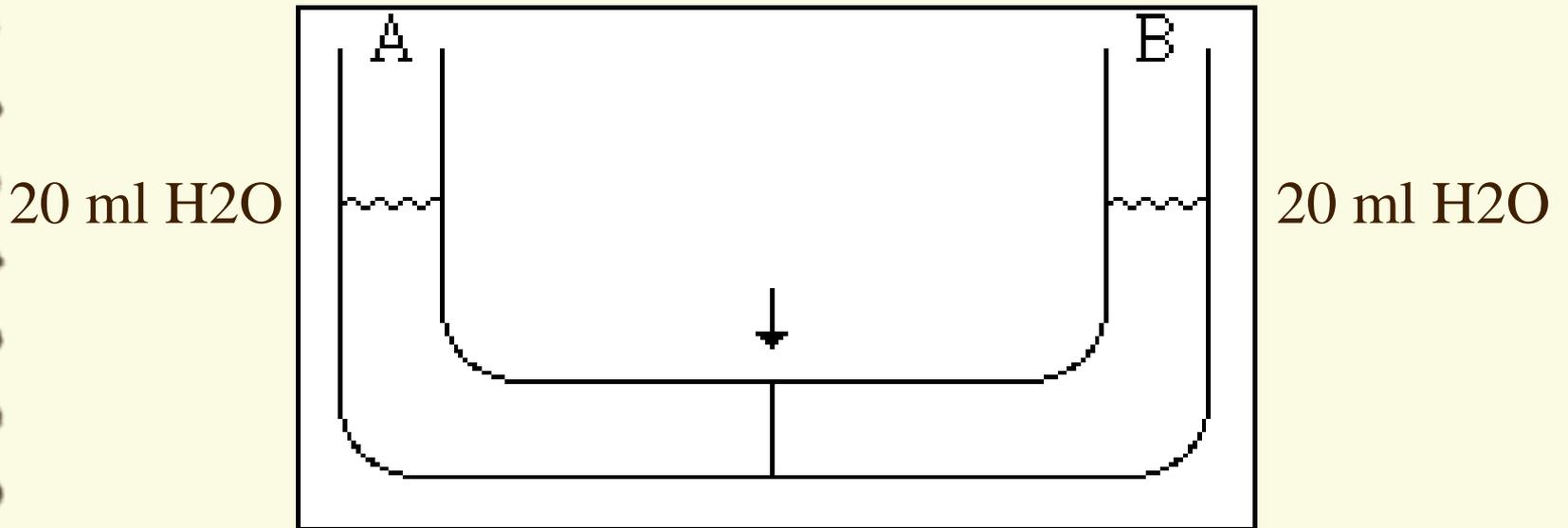
What will happen to the above cell?

The cell will burst.



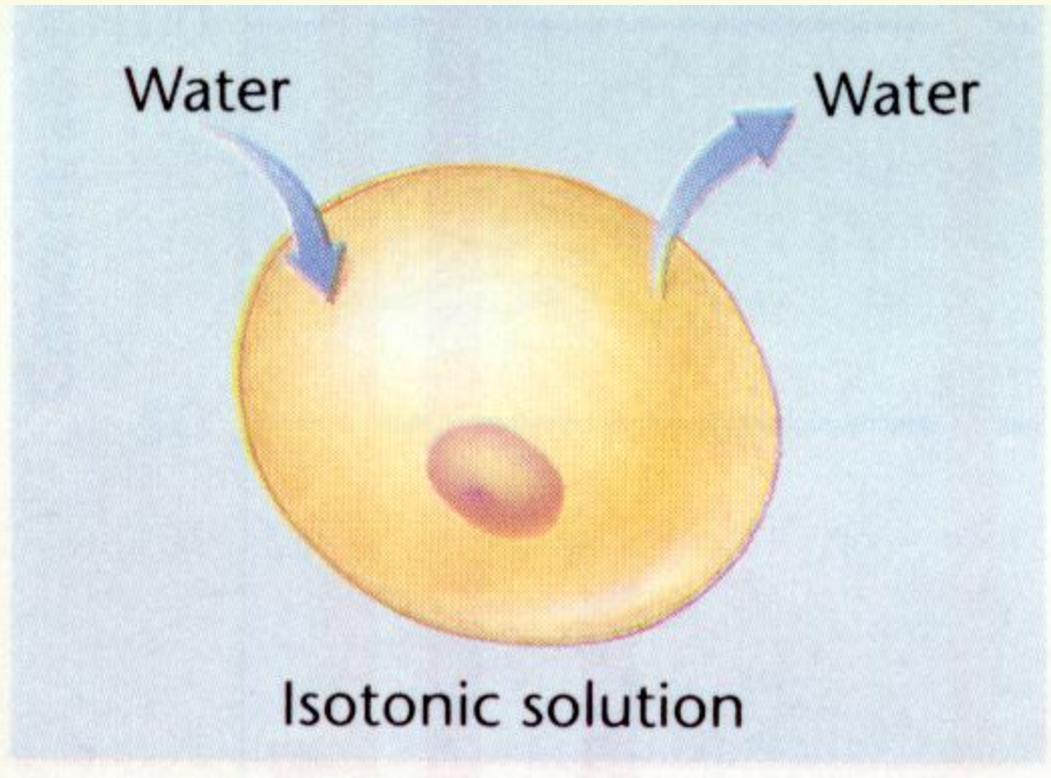
Isotonic

The concentration of water is equal on both sides of the membrane.



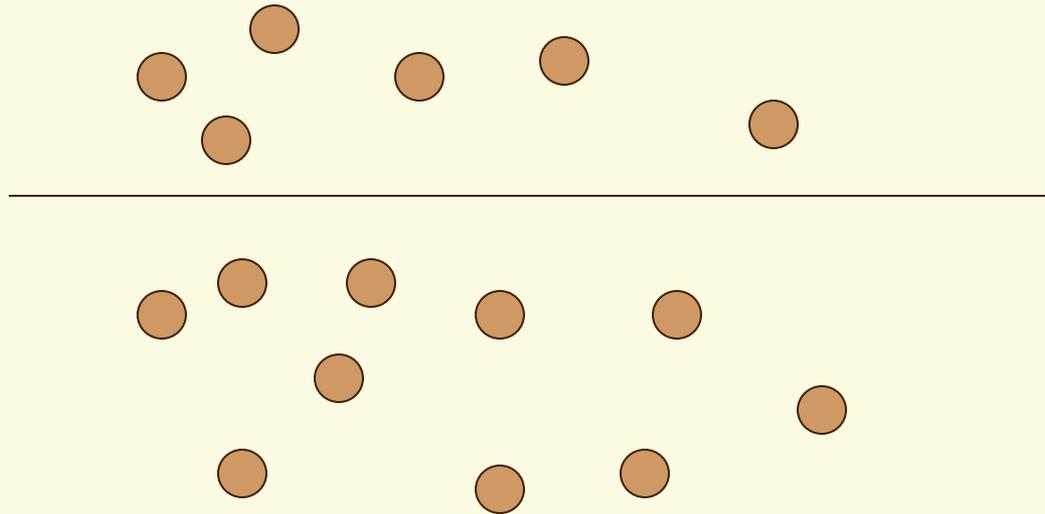
No net movement of water

An Isotonic Cell



Active Transport

The use of **energy** and carrier proteins to transport molecules from low concentration to high concentration.



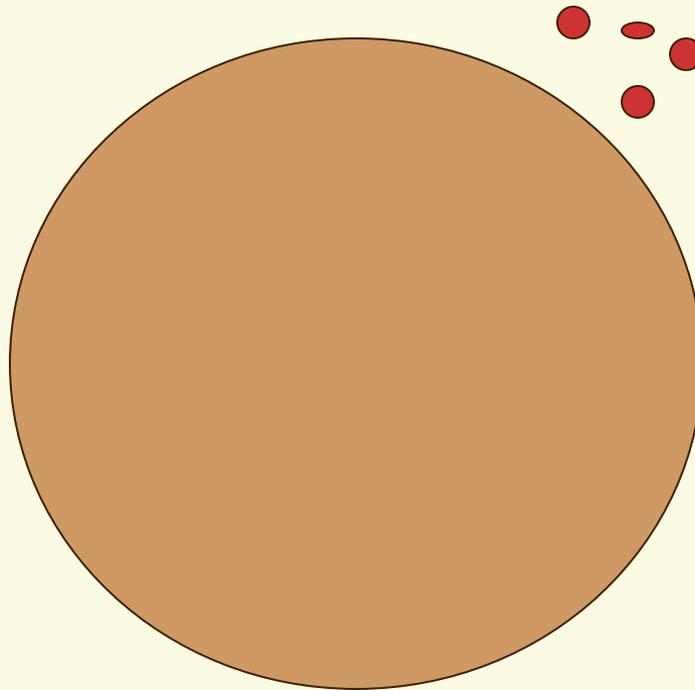
Bulk Transport

- 📄 Large molecules, food, and liquids are packaged in membrane-bound sacs and moved across the membrane.
- 📄 Examples: endocytosis, exocytosis, pinocytosis, and phagocytosis.

Endocytosis = Into the Cell

Pinocytosis – Cell engulfs a droplet of liquid.

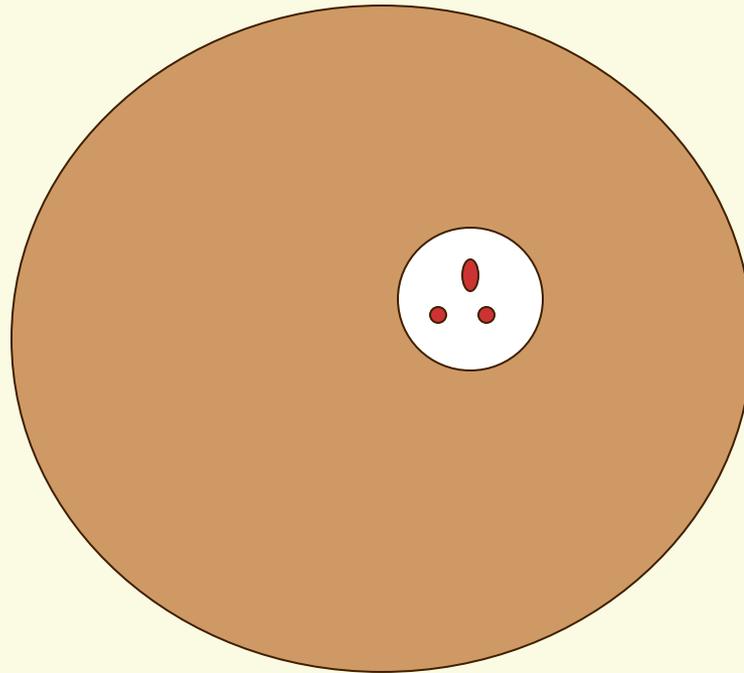
Phagocytosis – Cell engulfs a solid particle.



Exocytosis - Out of the Cell

The opposite of endocytosis.

Wastes and cell products exit the cell.



Review questions

Q: In which types of transport do molecules go from an area of High concentration to an area of low concentration?

A: Diffusion, osmosis, Facilitated diffusion

Q: What will happen to a cell if it is placed in a container of salt water?

A: It will shrink and shrivel

Q: Why is energy required in active transport?

A: Molecules are going from low to high concentration.

Q: Why are there so many different types of transport?

A: Not all molecules can pass through by diffusion.