Human biology
Methods of Transport

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Reference

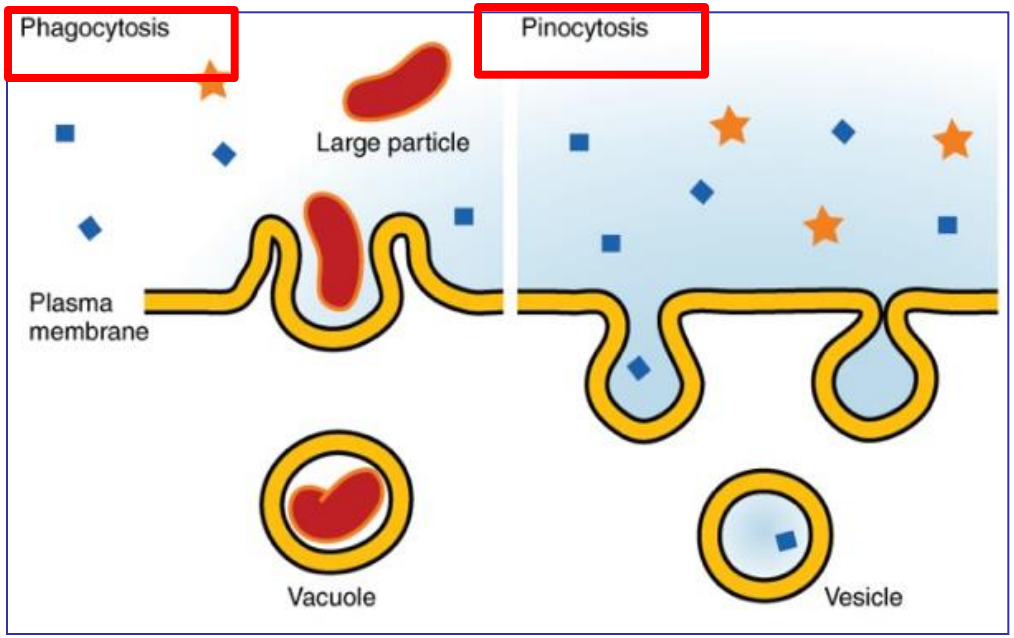
- Text book of human biology by John Kenneth Inglis 3rd Ed (1985)

Methods of Transport

1- Endocytosis: large molecules or other materials can enter the cell

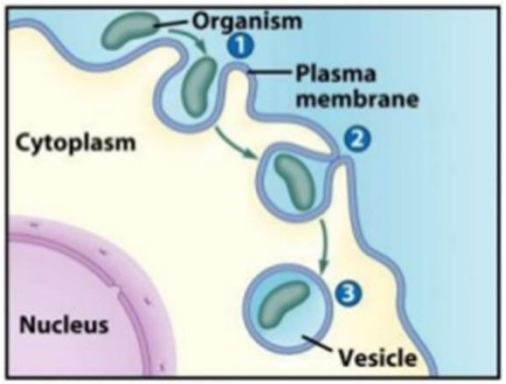
a. Cell eating is called **Phagocytosis**

b. Cell drinking is called **Pinocytosis**

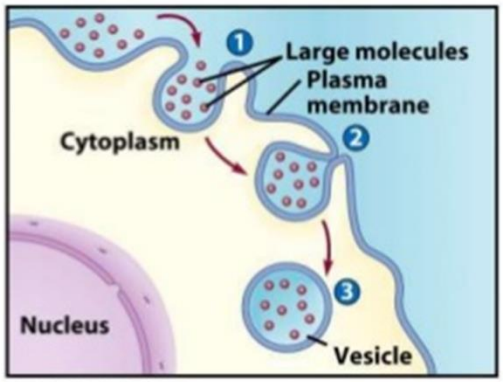


Exocytosis

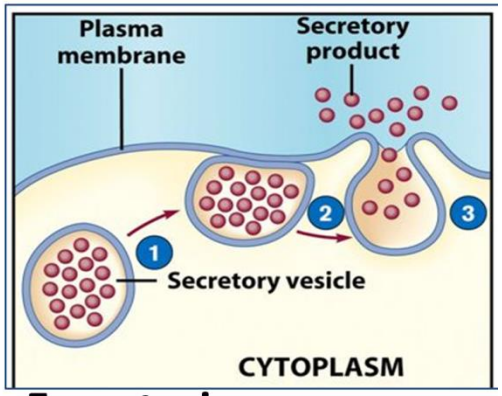
2- Exocytosis is the reverse of Endocytosis. The secretions or enzymes are packaged into vacuoles and then moved towards the cell membrane where they are discharged



PHAGOCYTOSIS



PINOCYTOSIS



Exocytosis

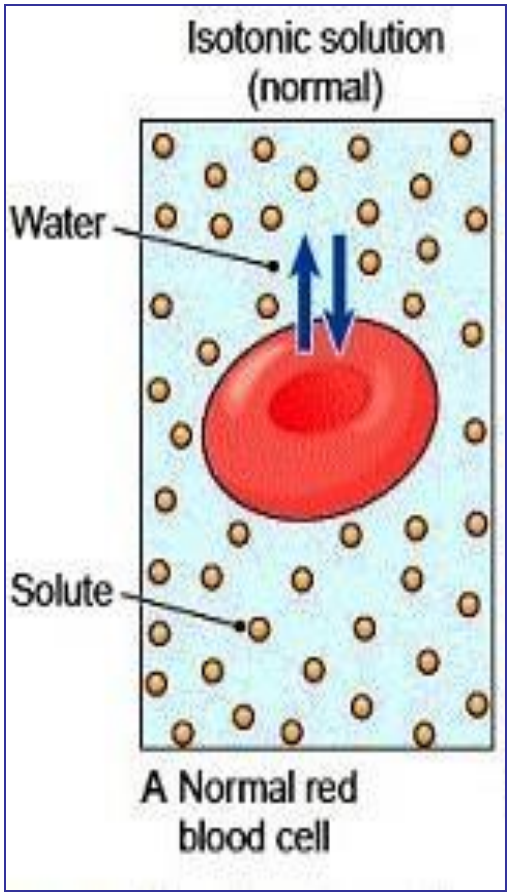
3- Diffusion: Movement from high concentration to low concentration

4- Osmosis: The diffusion of water across a selectively permeable membrane from an area of high concentration of water to an area of low concentration

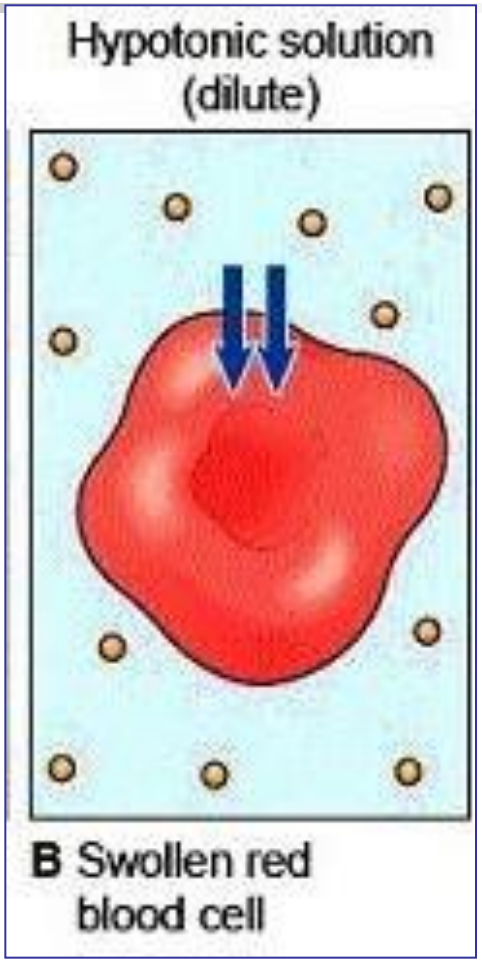
- Solutions have an osmotic effect on our tissues that is dependent upon the strength of the solution compared with that of the body fluids:

- **Isotonic solutions:** are those equal strength to our body fluids

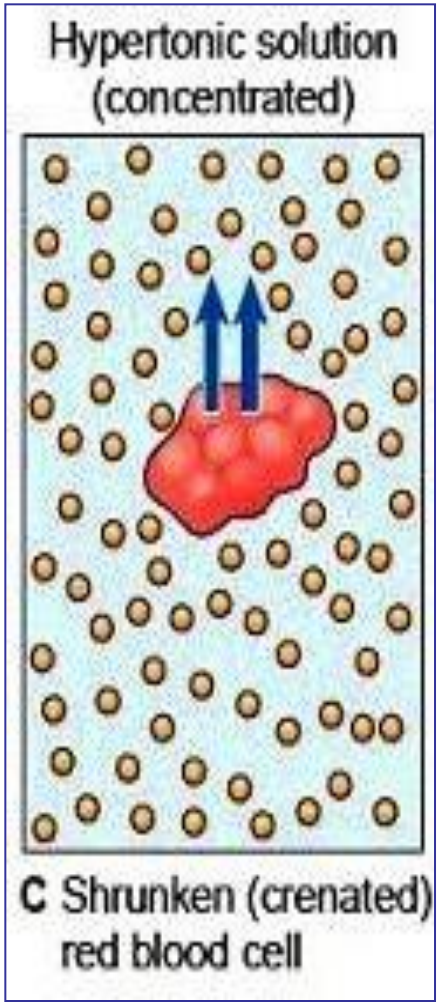
- They therefore cause neither shrinking nor swelling of cells and tissue



- **Hypotonic solutions:** contain less dissolved material and more water than the body fluids. This water passes into the cells by osmosis and causes them to swell up and eventually burst



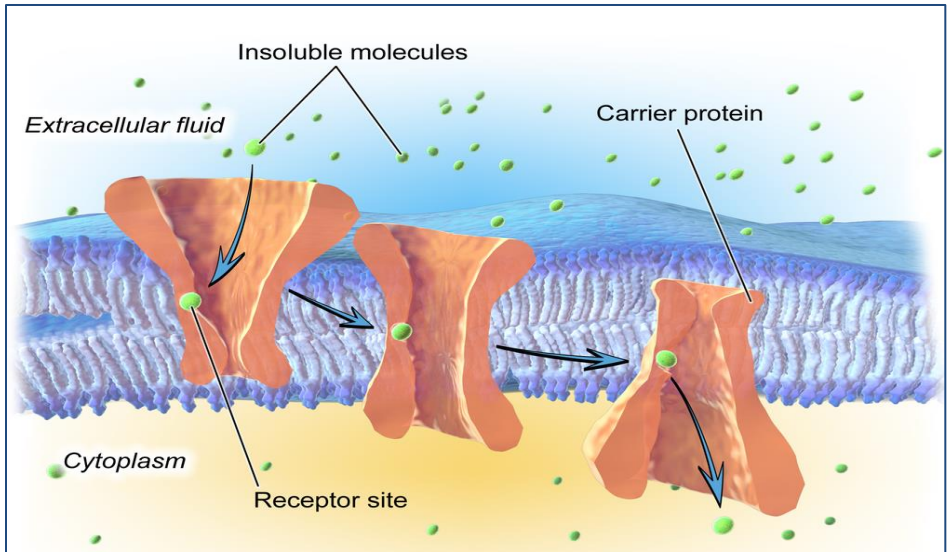
- **Hypertonic solutions:** contain more dissolved materials and less water than the body fluids. Water therefore leaves the cell by osmosis and causes them to shrink



5- Active transport: use energy to pump materials into the cell against the concentration gradient

6- Facilitated transport: this is a sort of faster diffusion

It takes place along special protein pathways in the cell membrane across which chemicals can pass more quickly. These protein carriers take glucose and amino acids into cell quicker than would be expected for normal diffusion processes



Cell division

- In cell division, the cell that is dividing is called the "**parent**" cell. The parent cell divides into two or more "**daughter**" cells. The process then repeats in what is called the **cell cycle**
- Depending on the type of cell, there are two ways cells divide

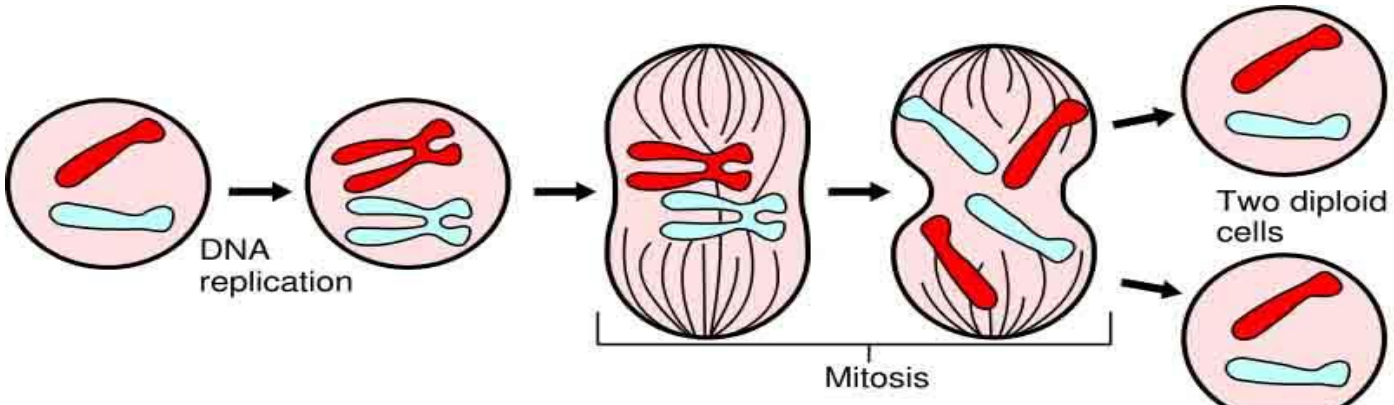
1. Mitosis
2. Meiosis

Mitosis

- Division of somatic cells (non-reproductive cells) in eukaryotic organisms

- A single cell divides into two identical daughter cells

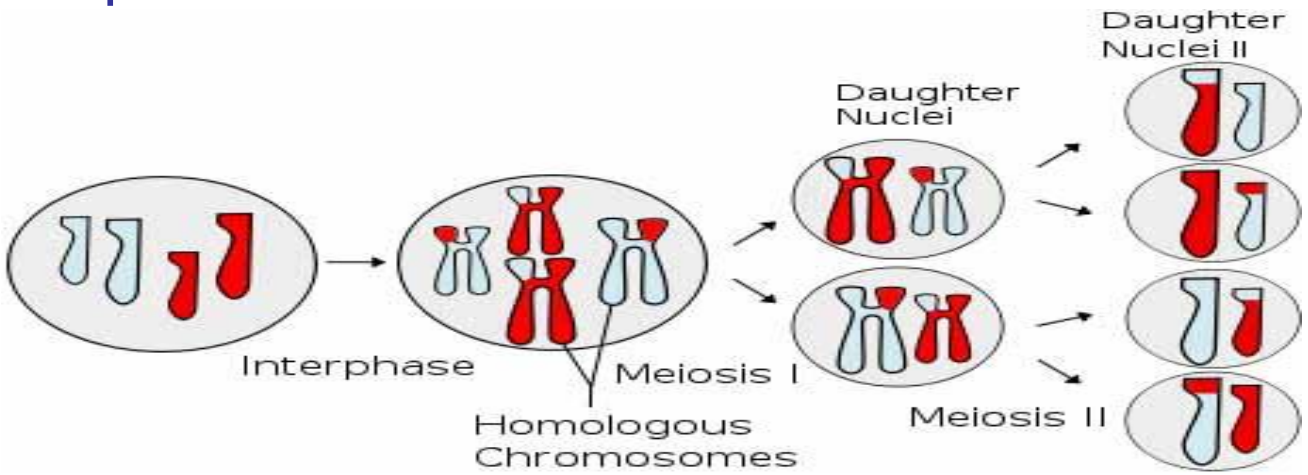
Daughter cells have **same** number of **chromosomes** as does parent cell



Meiosis

- A single **germ cell** divides into four unique daughter cells.

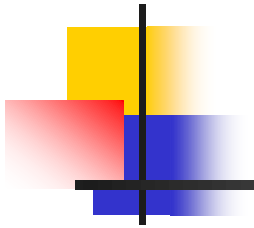
- Daughter cells have **half** the number of **chromosomes** as parent cell, so they considered haploid.



The characteristics of living organisms

Features	Animals	Plants
Movement	Very obvious	Not very obvious
Irritability (sensitivity)	Obviously able to respond to such stimuli as light, temperature, changes, vibration and touch	Little obvious response to stimulation over a short period of time
Respiration	Obvious organs associated with breathing	No obvious breathing action nor any organ associated with respiration
Nutrition	Heterotrophic method	Autotrophic method

Features	Animals	Plants
Growth	Cell number increase more rapidly in some areas of the body than the other. The skin for example is in a state of continuous repair or growth	The increase number of cells is called growth. Cells divide by mitosis.
Excretion	There are obvious excretory organ (kidney, skin, lung) and obvious excretory products (urine, faces, water and carbon dioxide)	There are no obvious organ of excretion or obvious excretory products except for water and carbon dioxide.



Thank you