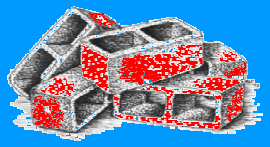
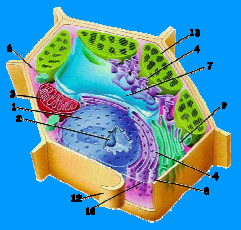
Cytology

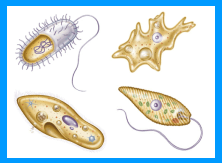


Levels of Organization (2-4)

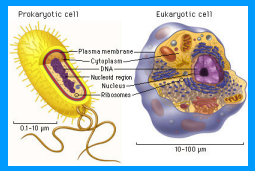


Plant Cell (14-31)

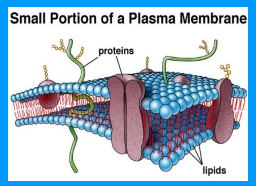
Cell Theory (5-12)



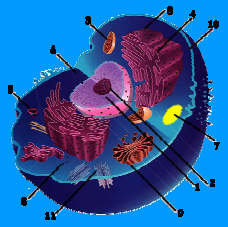
Unicellular vs. Multicellular (32)



Prokaryotic vs. Eukaryotic (14)



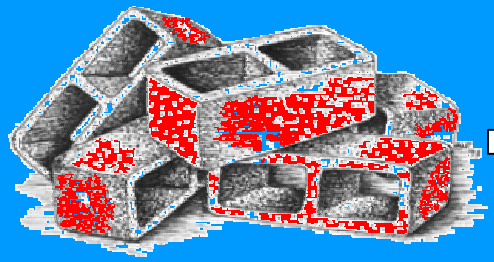
Cell Membrane &
Cellular Transport (33-39)



Animal Cell (14-31)

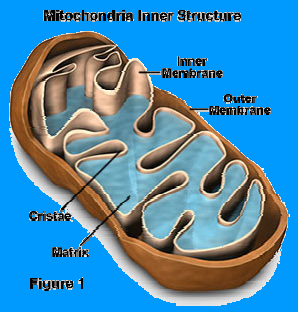
Cytology – The study of the "CELL"

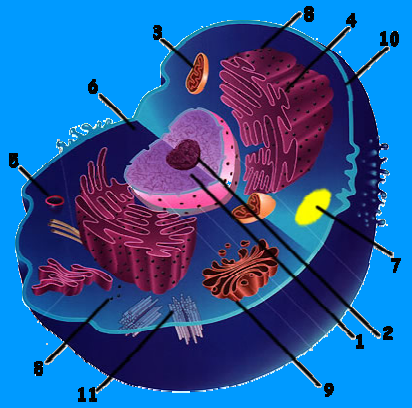
Analogy of "The Brick"

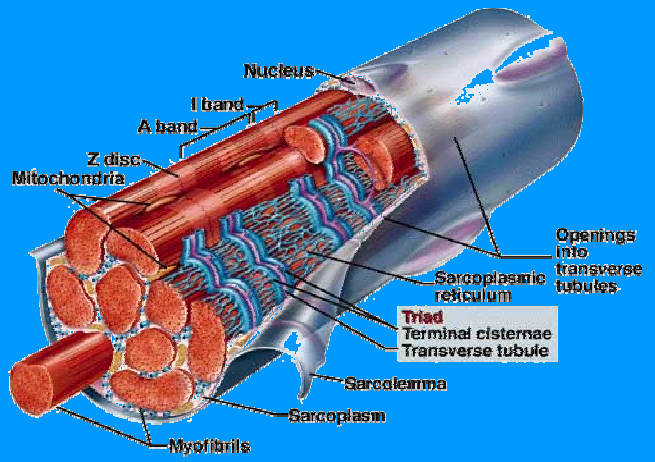


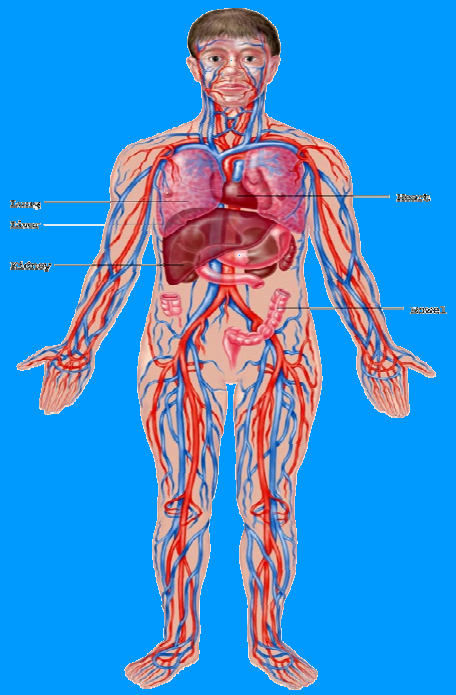
Cytology – The study of the "CELL"

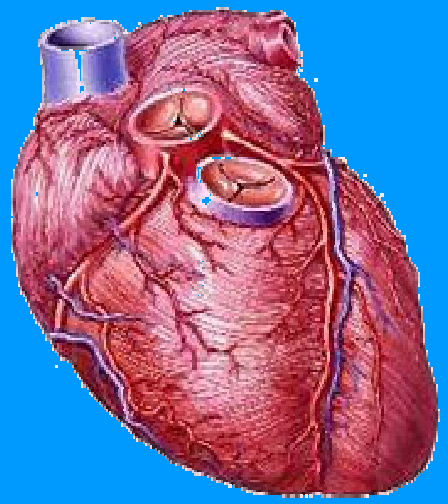
The Levels of Organization



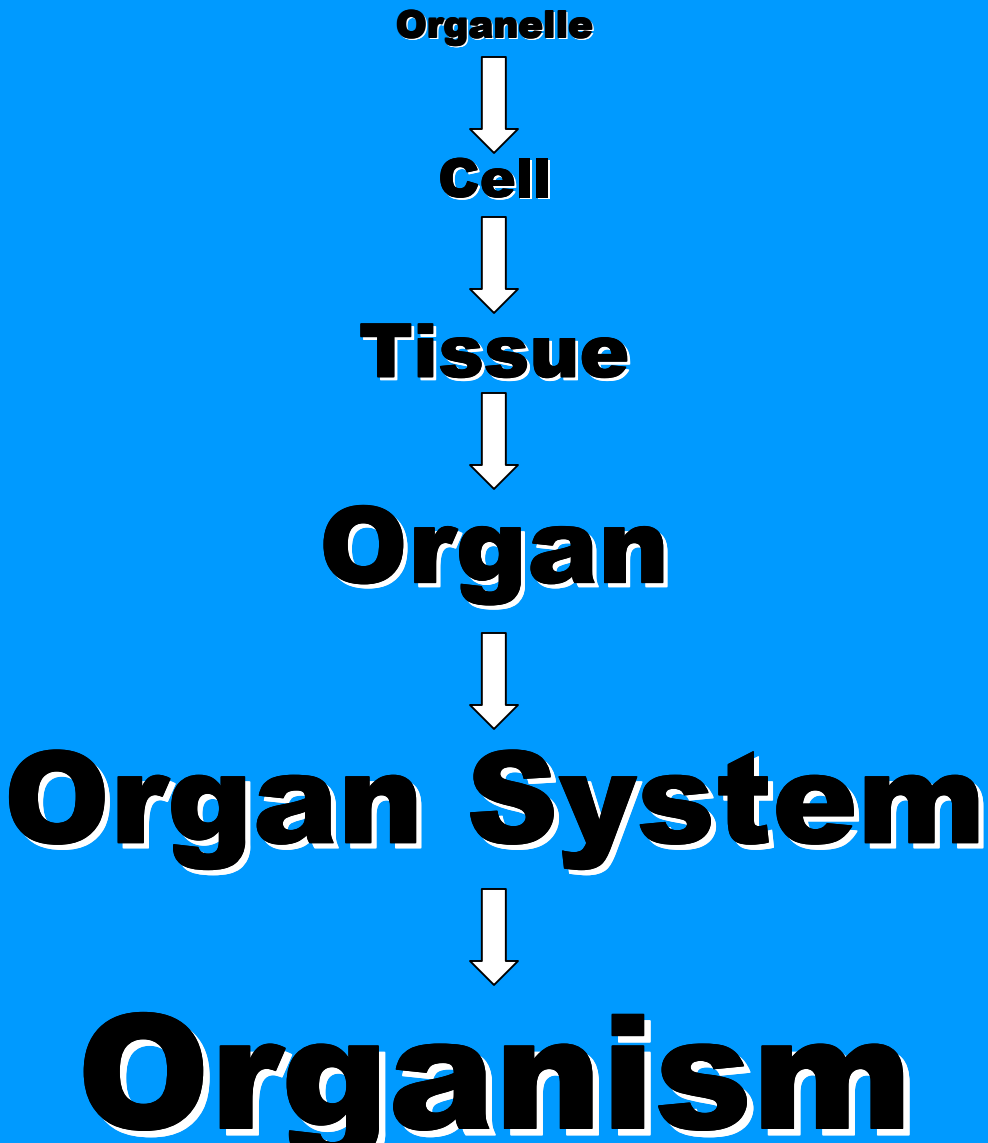






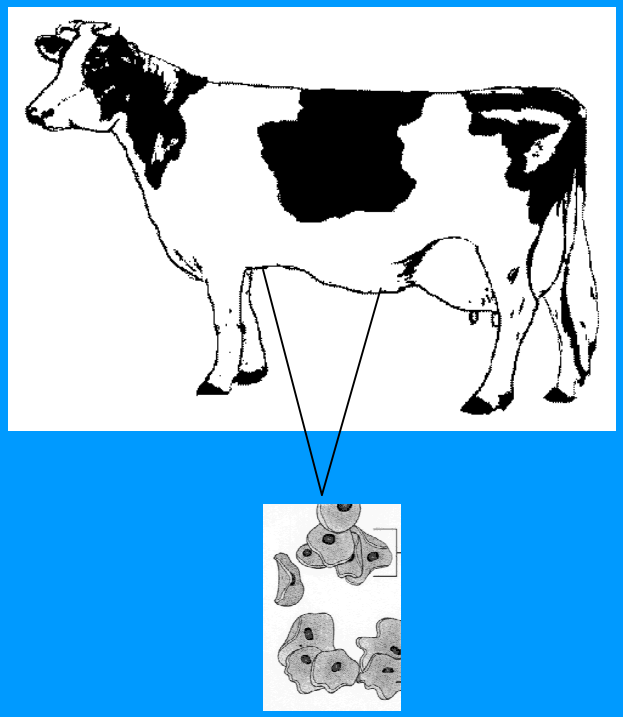


The Levels of Organization

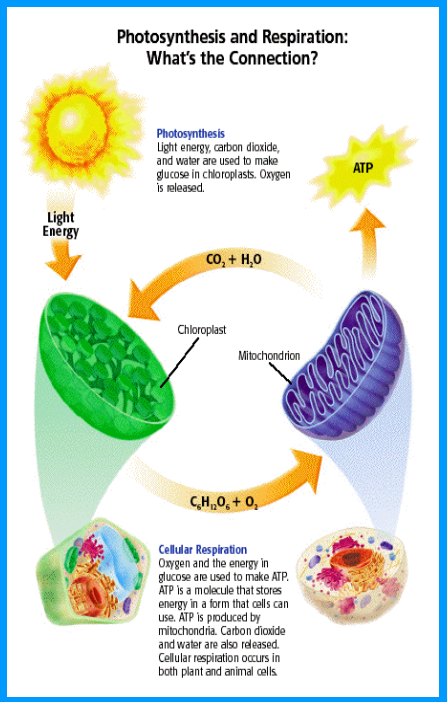


The Cell Theory

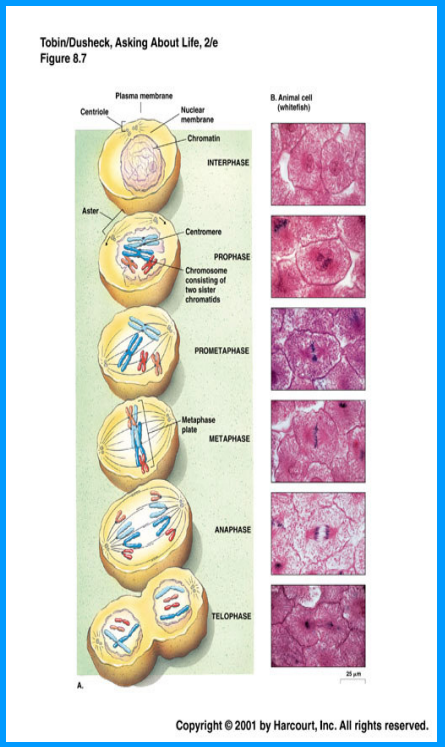
1



2



3

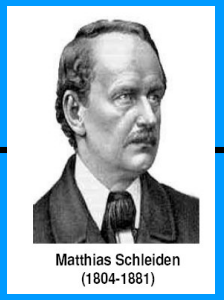


Historical Contributors

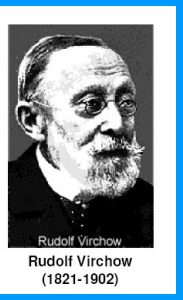

Zacharias Janssen
(1580-1638)


Robert Hooke
(1635-1703)

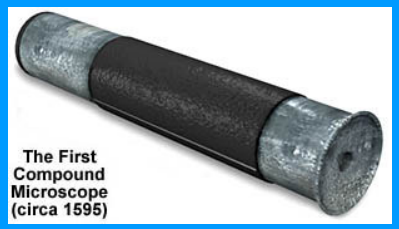

Antonie van Leeuwenhoek
(1632-1723)


Matthias Schleiden
(1804-1881)


Theodor Schwann
(1810-1882)



Rudolf Virchow
(1821-1902)


The First
Compound
Microscope
(circa 1595)

1595

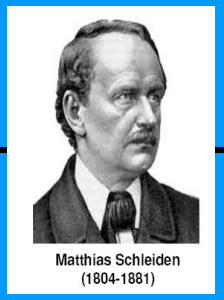
1953

Historical Contributors

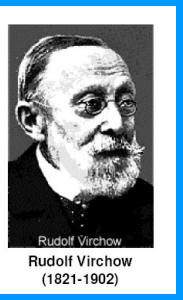

Zacharias Janssen
(1580-1638)


Robert Hooke
(1635-1703)

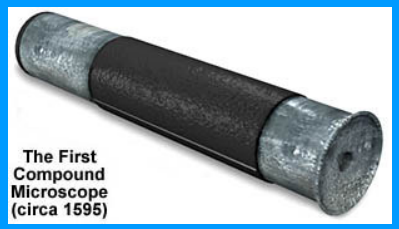

Antonie van Leeuwenhoek
(1632-1723)


Matthias Schleiden
(1804-1881)


Theodor Schwann
(1810-1882)



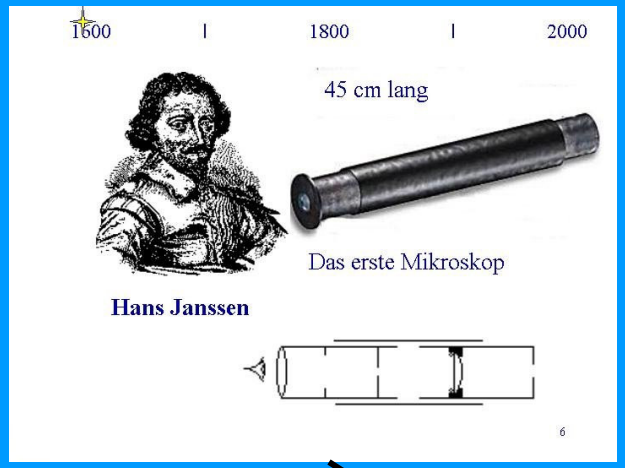
Rudolf Virchow
(1821-1902)


The First
Compound
Microscope
(circa 1595)

1595

1953

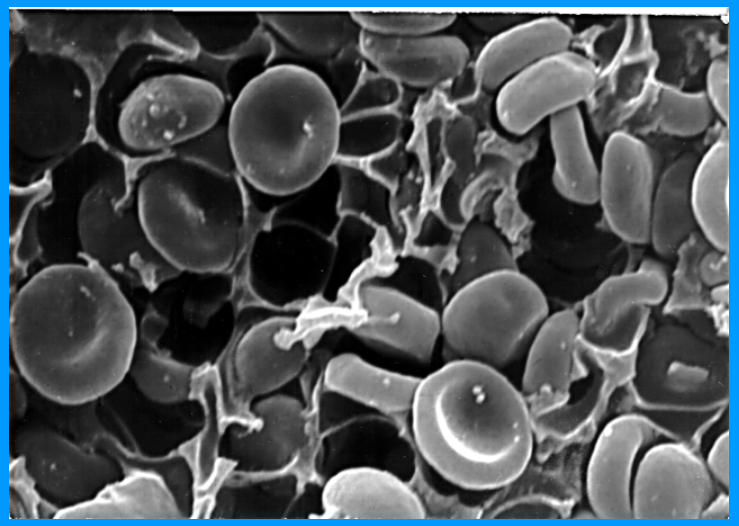
Hans & Zacharias Janssen (1600)



Robert Hooke (1665)

- English Scientist
- Looked at cork through a compound microscope
- Observed tiny room-like structures
- Called these structures “Cells
- Only saw outer walls of the cells because cork cells are not alive

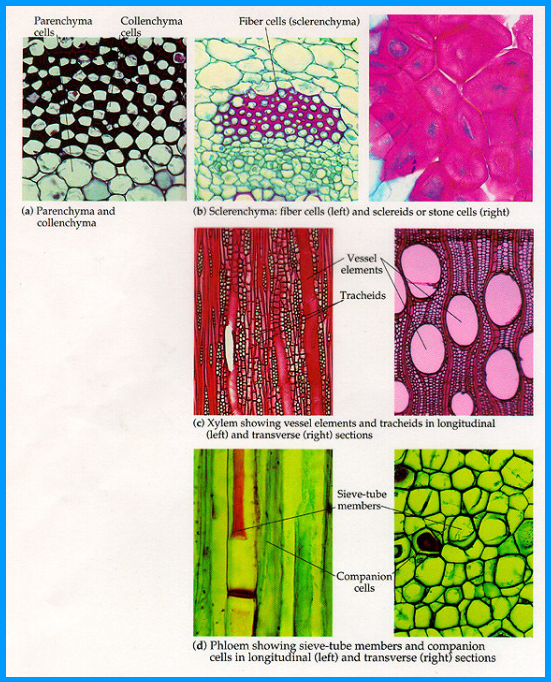
Anton Van Leeuwenhoek (1680)



- Dutch fabric merchant and amateur scientist
- Looked at blood, scrapings from teeth and rain water through a simple microscope (1 Lens)
- Observed living cells called some “animalcules”
- Some of the small “animalcules” are now called bacteria.

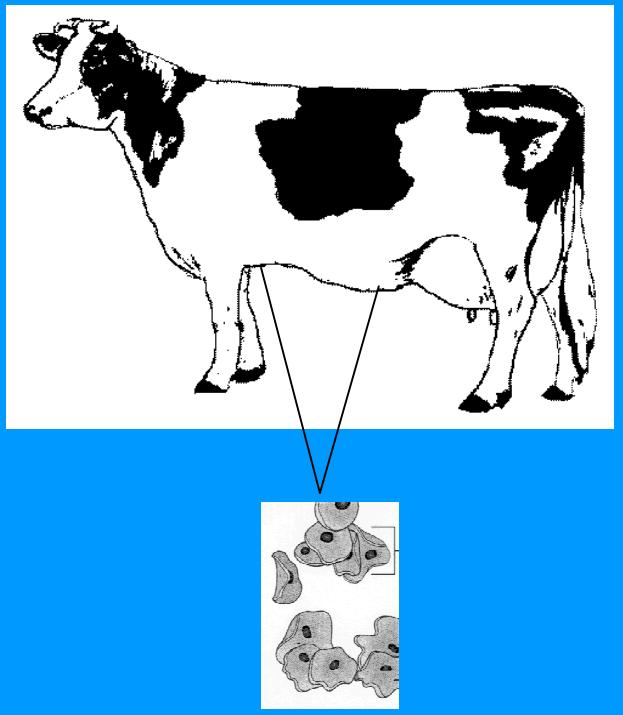
Matthias Schleiden (1838)

Matthias Schleiden
(1804-1881)



- German Botanist
- Viewed plant parts under a microscope
- Discovered that plant parts are made of cells

Theodor Schwann (1839)

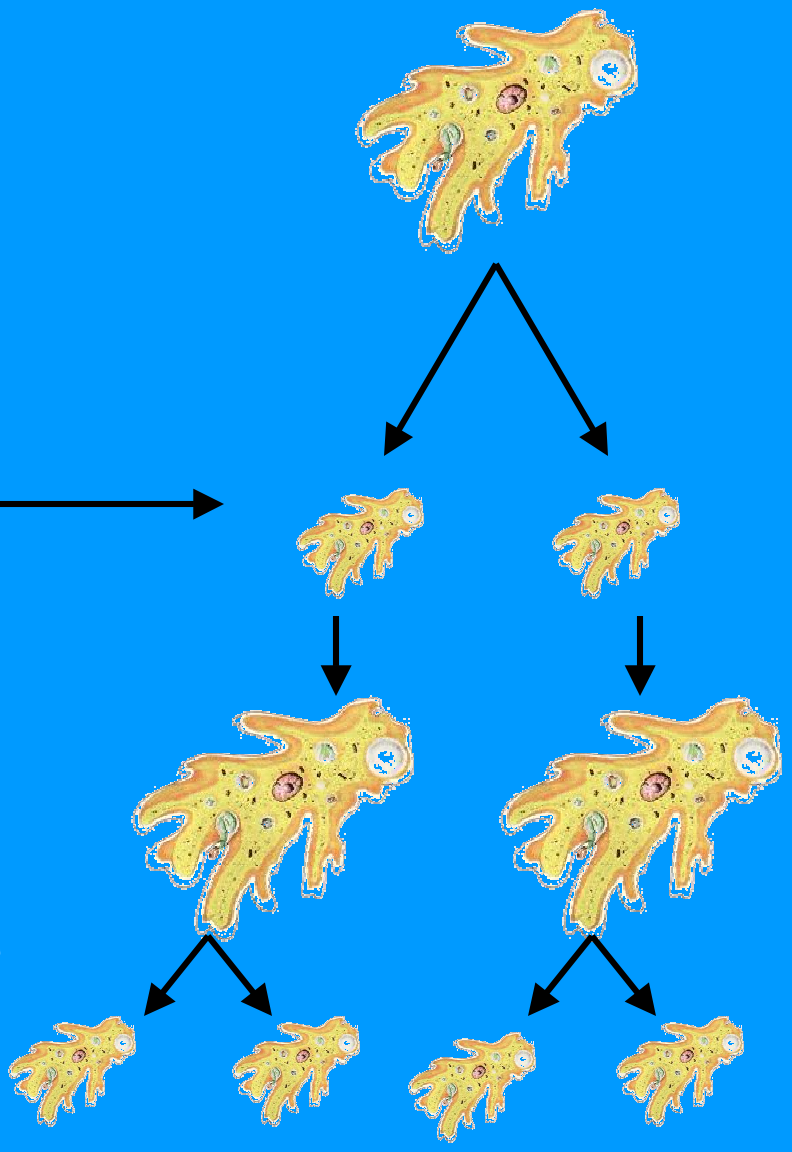


- German Zoologist
- Viewed animal parts under a microscope
- Discovered that animal parts are made of cells

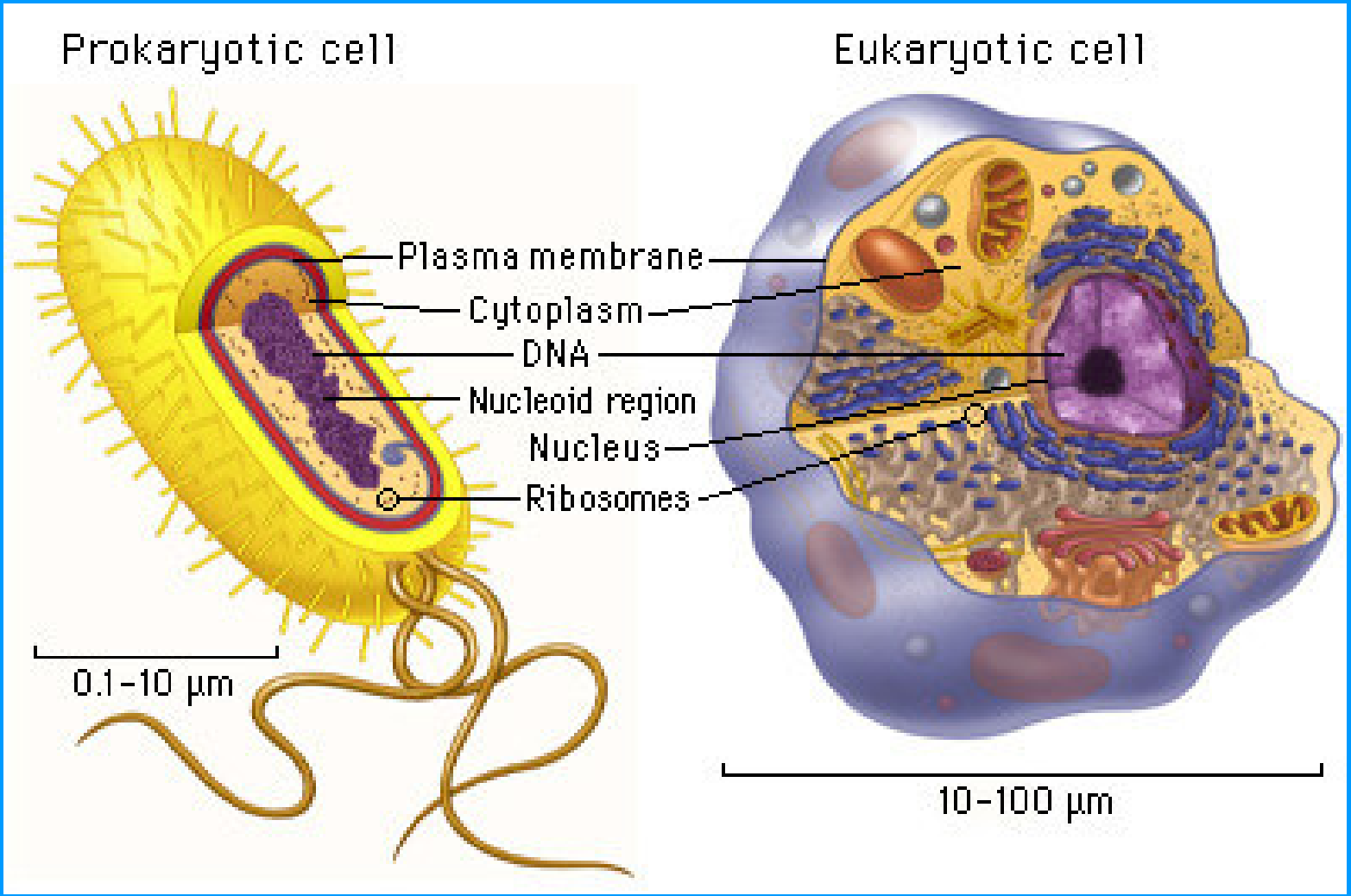
Rudolf Virchow (1855)

Rudolf Virchow
(1821-1902)

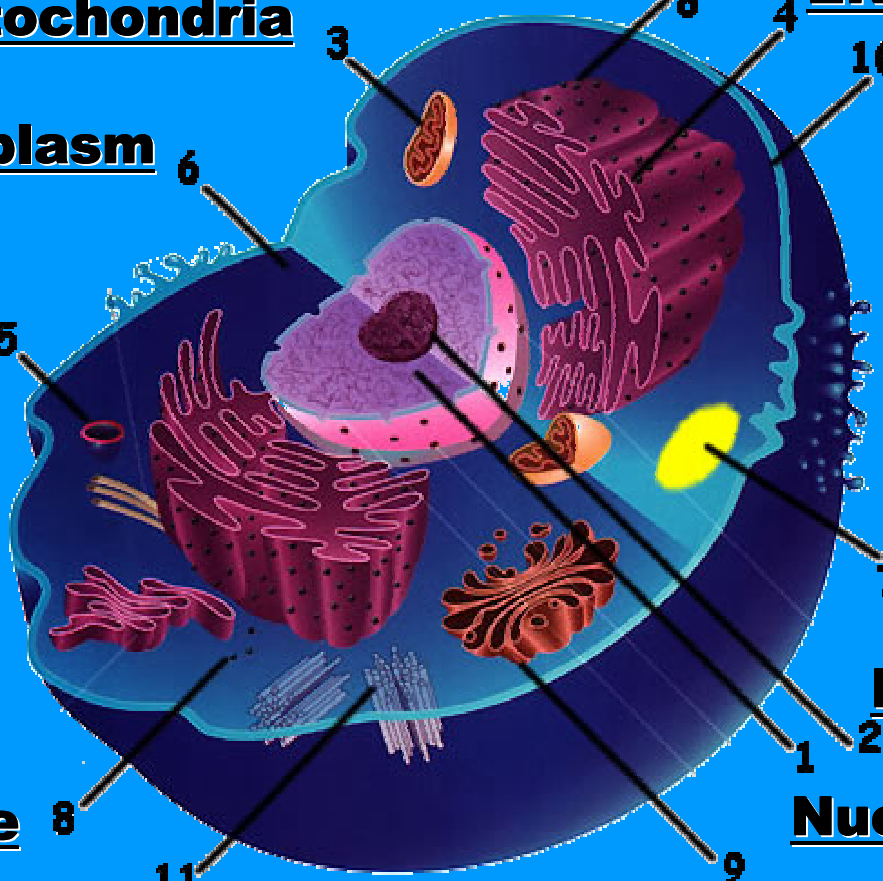
- German Physician
- Stated that all living cells come from other living cells



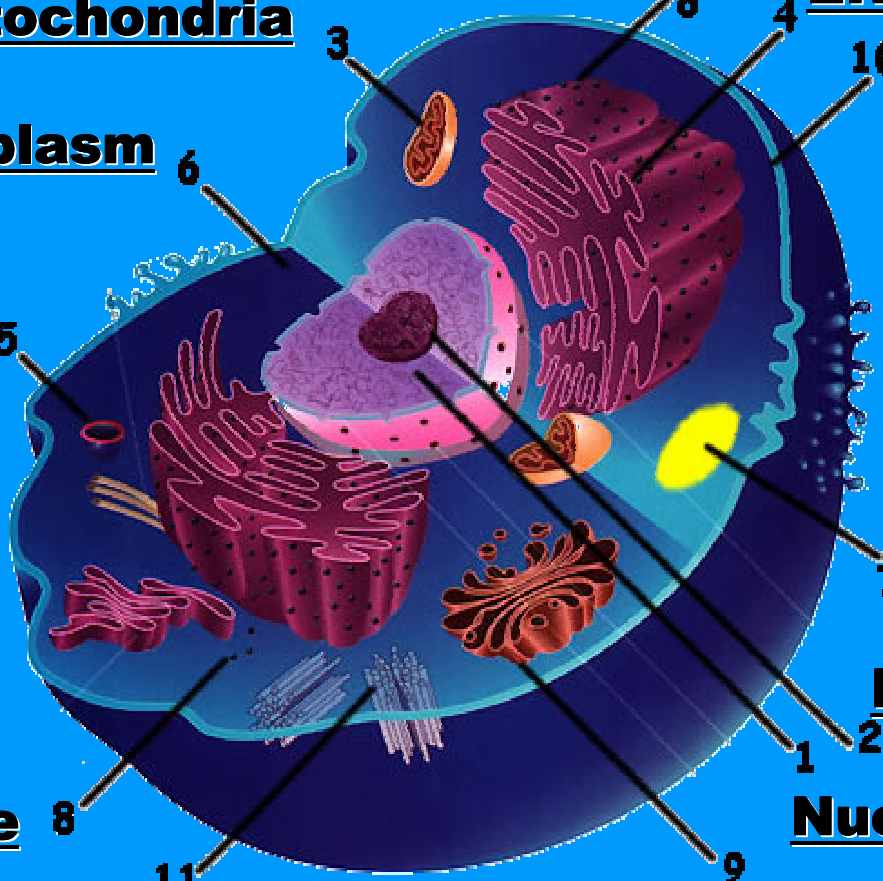
Prokaryotic vs. Eukaryotic Cells



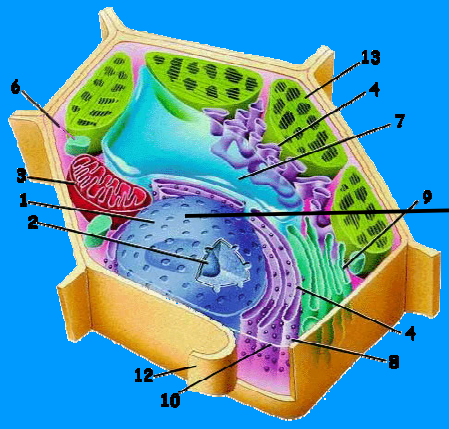
Animal Cell

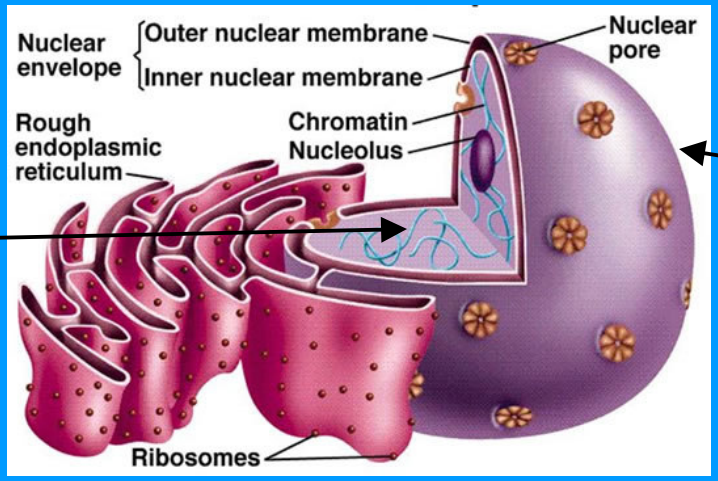

Ribosome
8
ER
4
Mitochondria
3
10
Cell Membrane
Cytoplasm
6
Lysosome
5
Vacuole
7
Nucleolus
2
1
Ribosome
8
Nucleus
11
9
Centrioles
Golgi Body

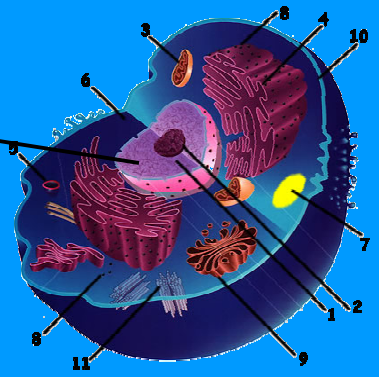
Animal Cell


Ribosome
8
ER
4
Mitochondria
3
10
Cell Membrane
Cytoplasm
6
Lysosome
5
Vacuole
7
Nucleolus
2
1
Ribosome
8
Nucleus
11
9
Centrioles
Golgi Body

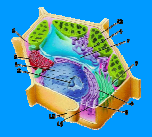
Nucleus

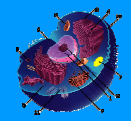




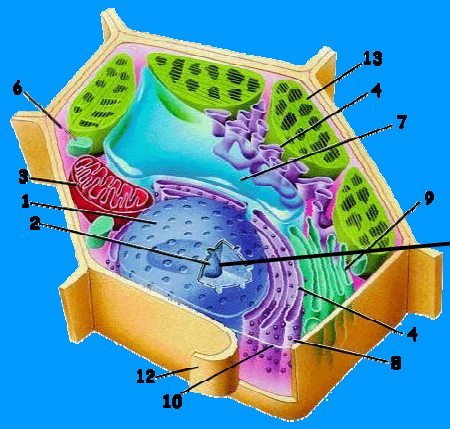


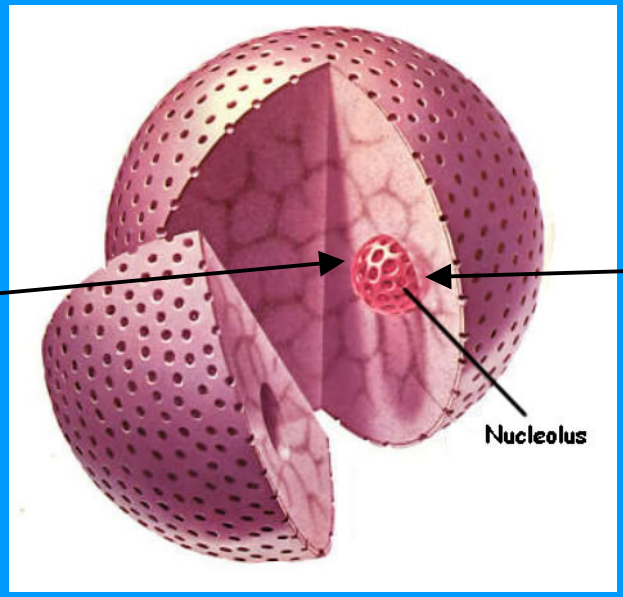
The Nucleus controls most cell activities and contains the hereditary information of DNA

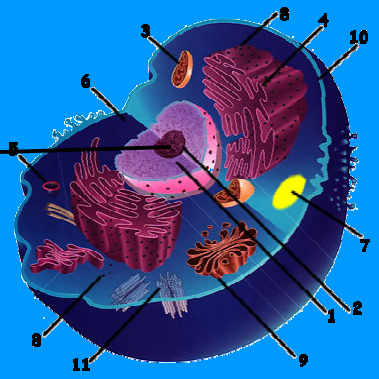




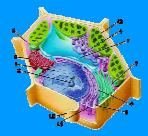
Nucleolus

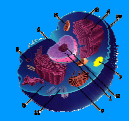




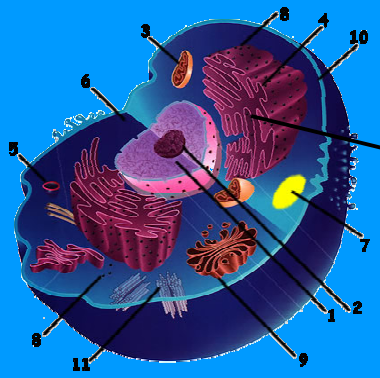


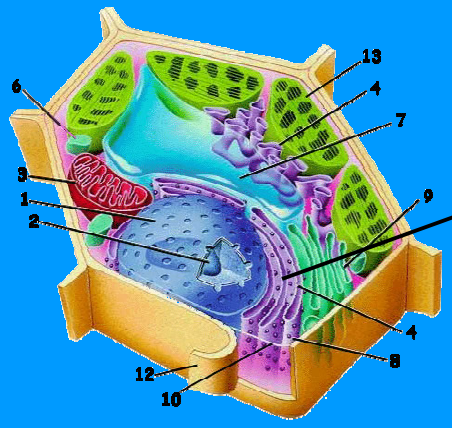
Found within the nucleus, site of ribosome formation

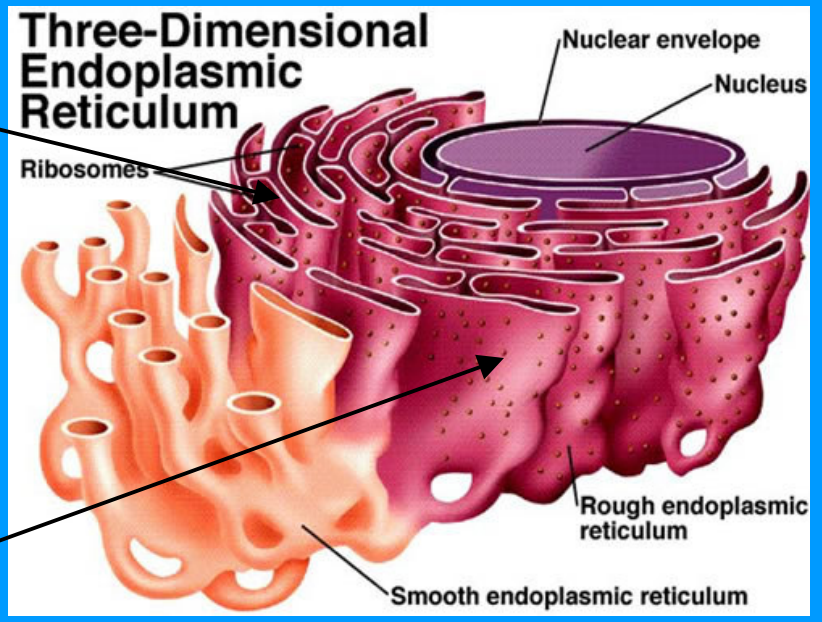




Endoplasmic Reticulum

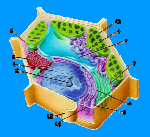


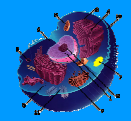




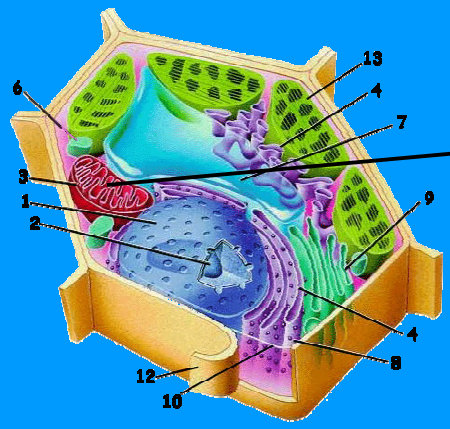
Responsible for the modification and transportation of proteins throughout the cell

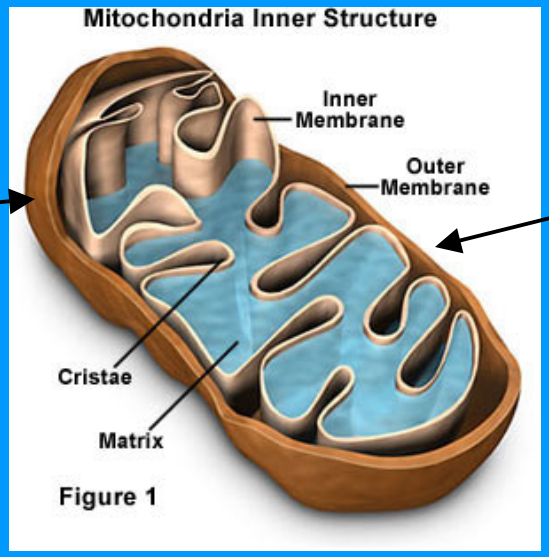
Rough ER = Ribosomes attached
Smooth ER = No Ribosomes attached

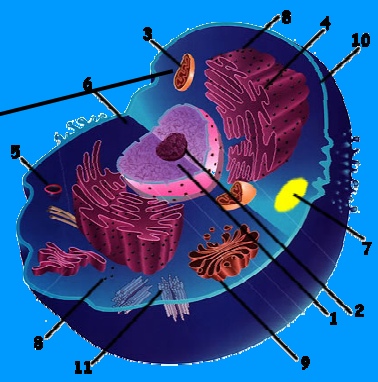




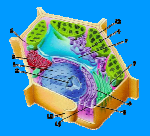
Mitochondria

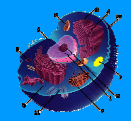




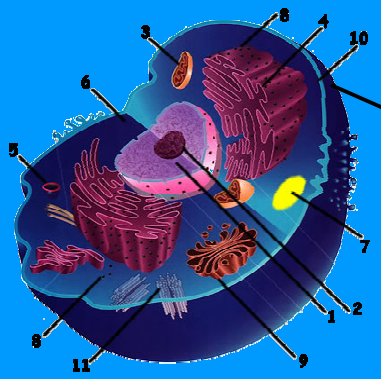


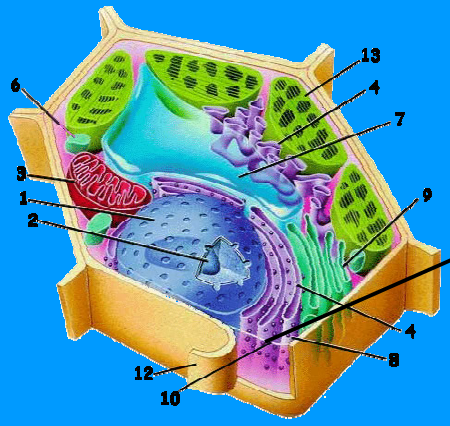
Site of Cellular Respiration
Uses energy from food to make ATP (cellular Energy)

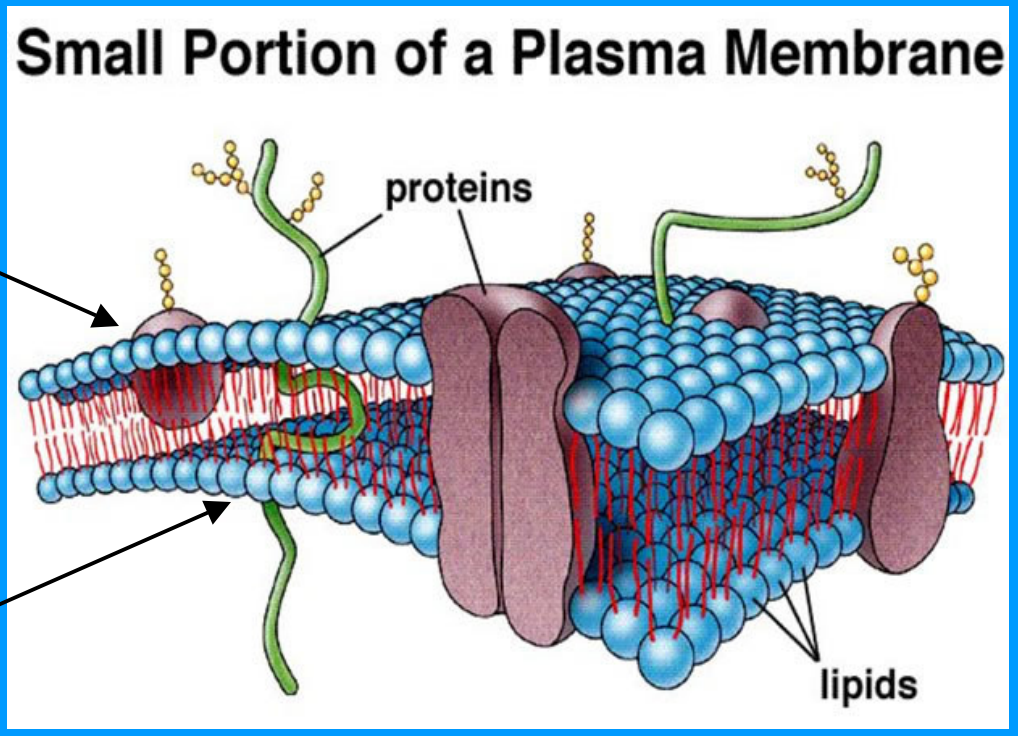




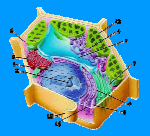
Cell Membrane – Fluid Mosaic Model

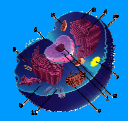




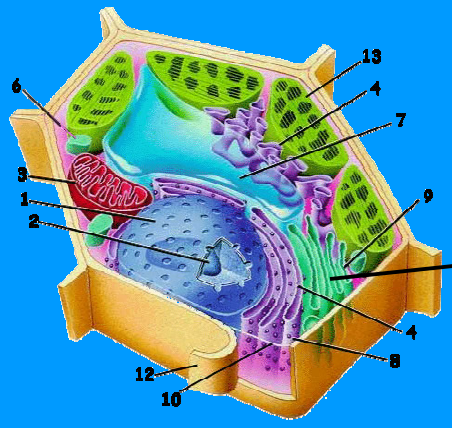


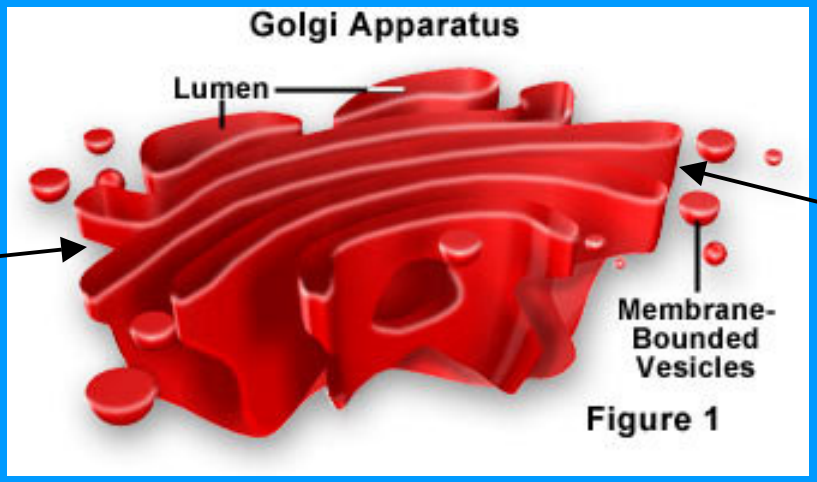
Regulates what enters and leaves the cell and also provides protection and support

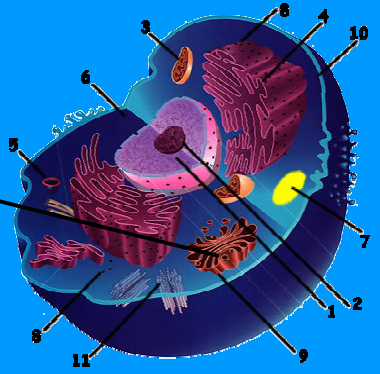




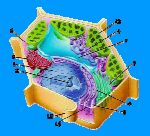
Golgi Body

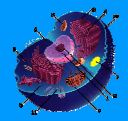




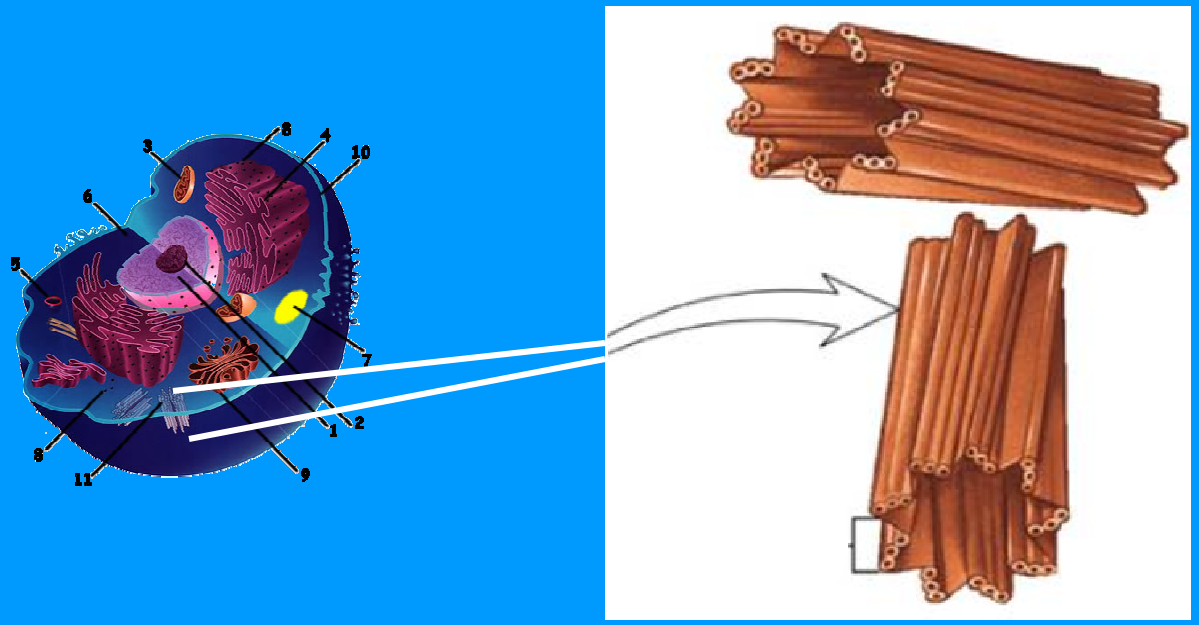


Serve as processing, packaging, and storage centers for the products released from the cell



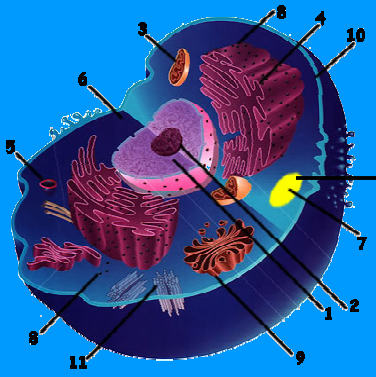


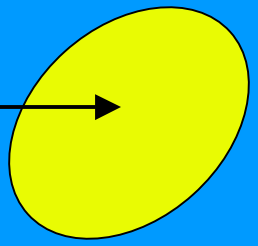
Centrioles

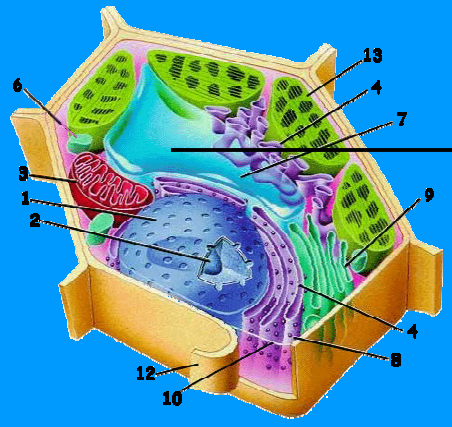


Found in Animal Cells and involved in cell division

Vacuole

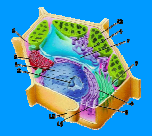


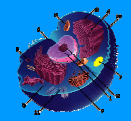




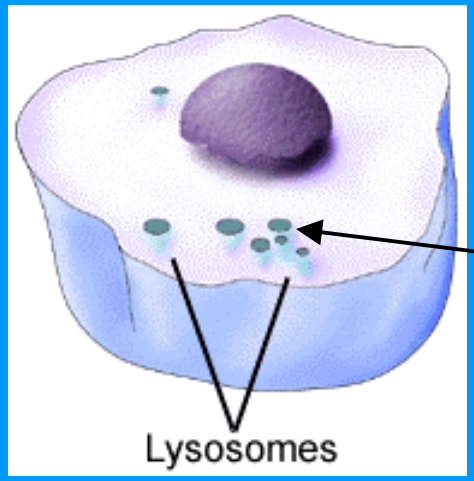
Fluid-filled organelles that serve as storage sites for certain cell products

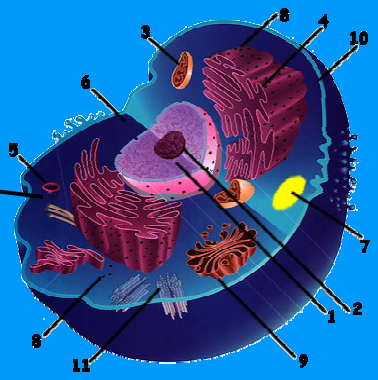
i.e. Food Vacuole, Contractile Vacuole





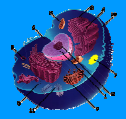
Lysosome



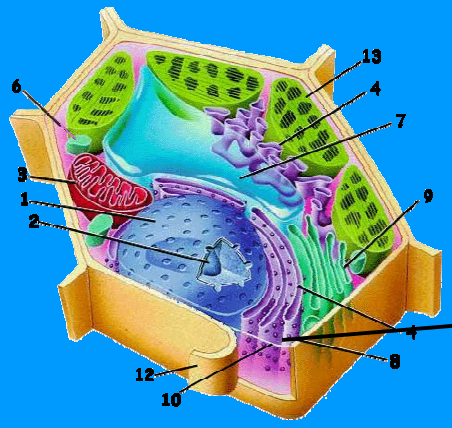


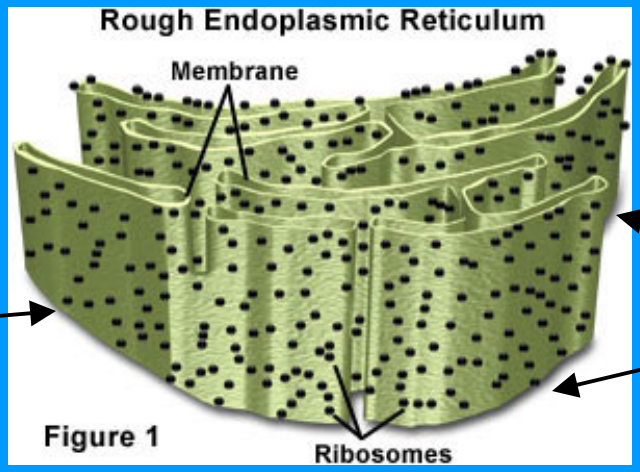
Contain digestive enzymes and responsible for the digestion of worn-out cell parts

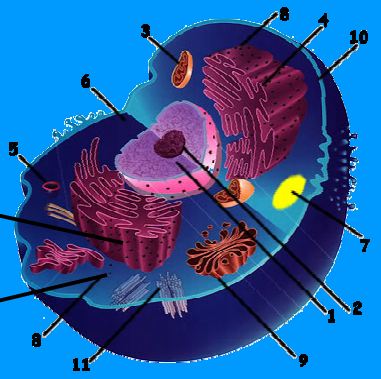
WBC's contain lysosomes to digest bacteria ingested by the WBC



Ribosome

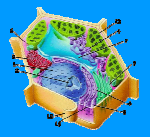


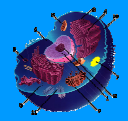




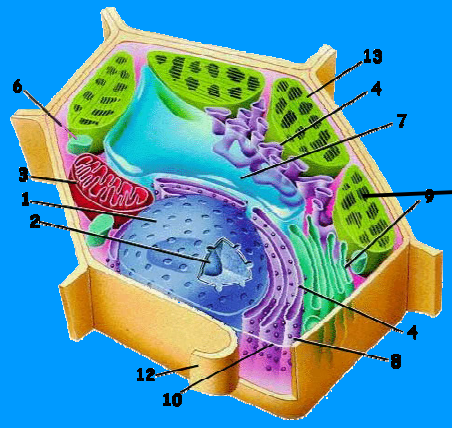
Site of Protein Synthesis

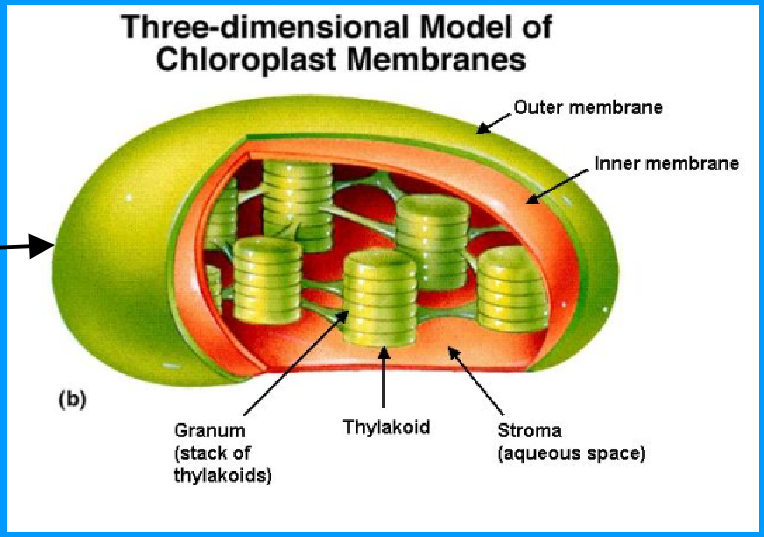
-some are attached to the ER
-some are free in the cytoplasm



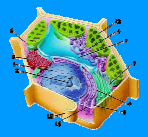


Chloroplast

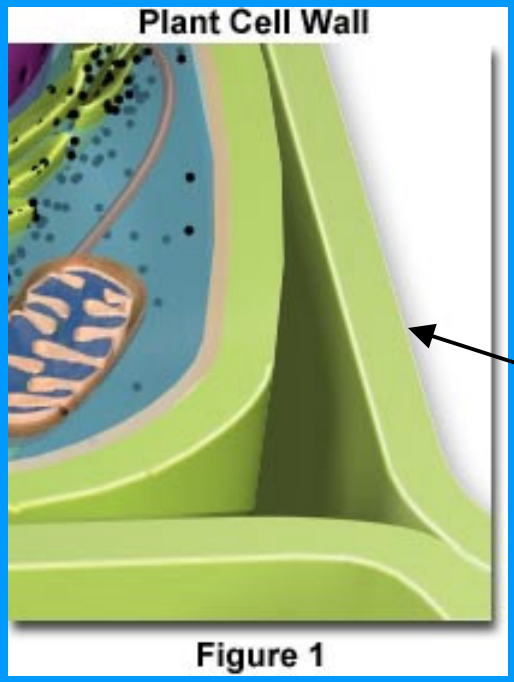


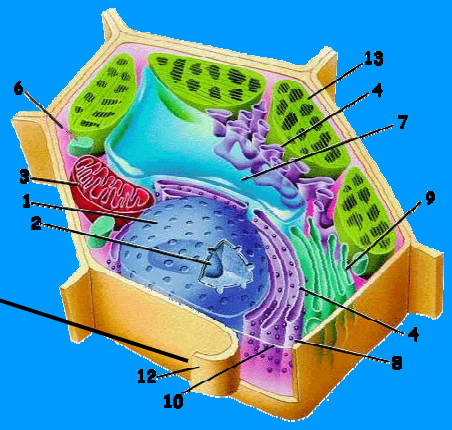


Contains the photosynthetic pigments – Chlorophyll
Site of Photosynthesis – food making process in plants



Cell Wall

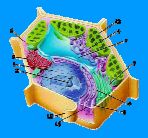




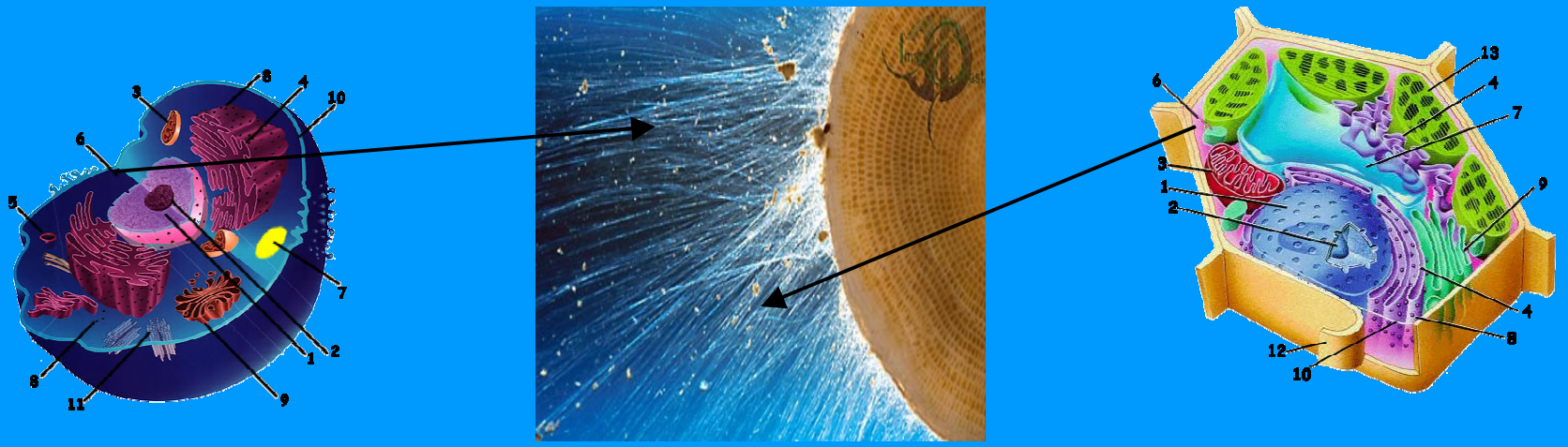
Found in plants and most Prokaryotic Cells

Lies outside the cell membrane and gives shape and provides protection for the cell

-Made of nonliving material called cellulose in plants

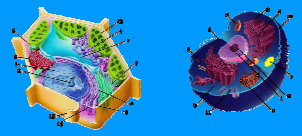


Cytoplasm

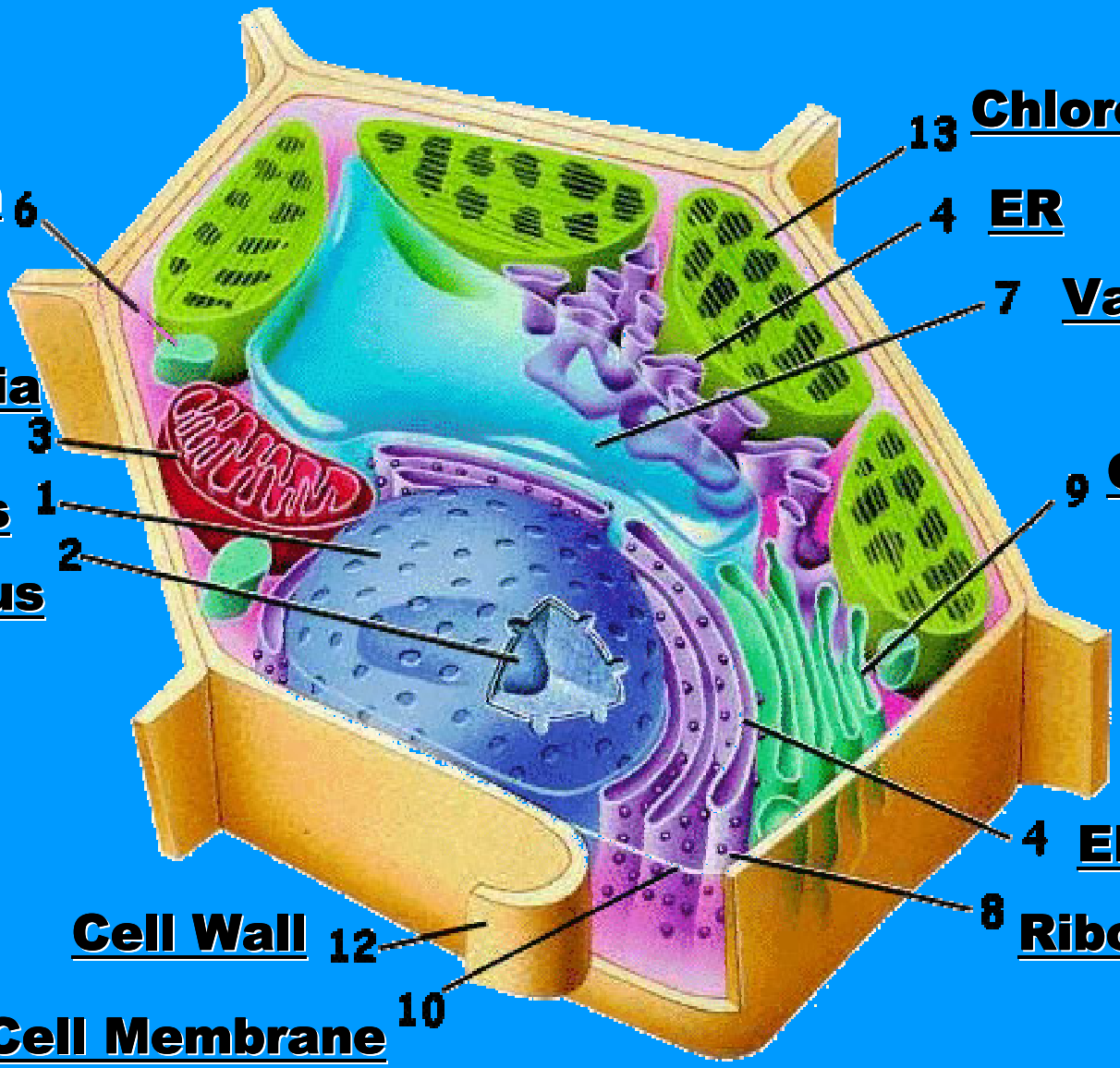


Watery material lying within the cell between the cell membrane and the nucleus

Most of the chemical reactions of the cells Metabolism take place in the cytoplasm



Plant Cell



Cytoplasm 6

Mitochondria 3

Nucleus 1

Nucleolus 2

13 Chloroplast

4 ER

7 Vacuole

9 Golgi Body

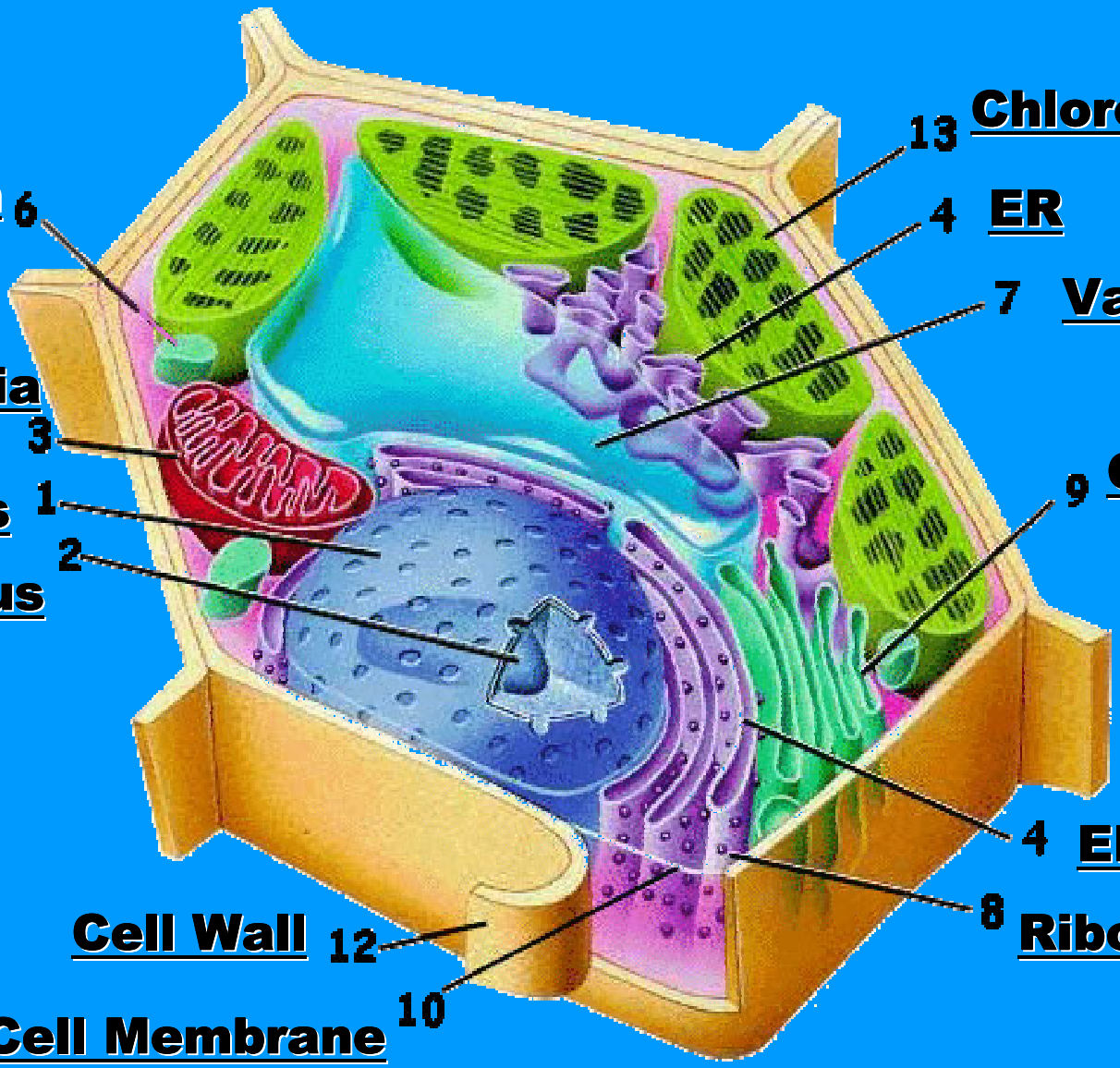
4 ER

8 Ribosome

Cell Wall 12

Cell Membrane 10

Plant Cell



Cytoplasm 6

Mitochondria 3

Nucleus 1

Nucleolus 2

13 Chloroplast

4 ER

7 Vacuole

9 Golgi Body

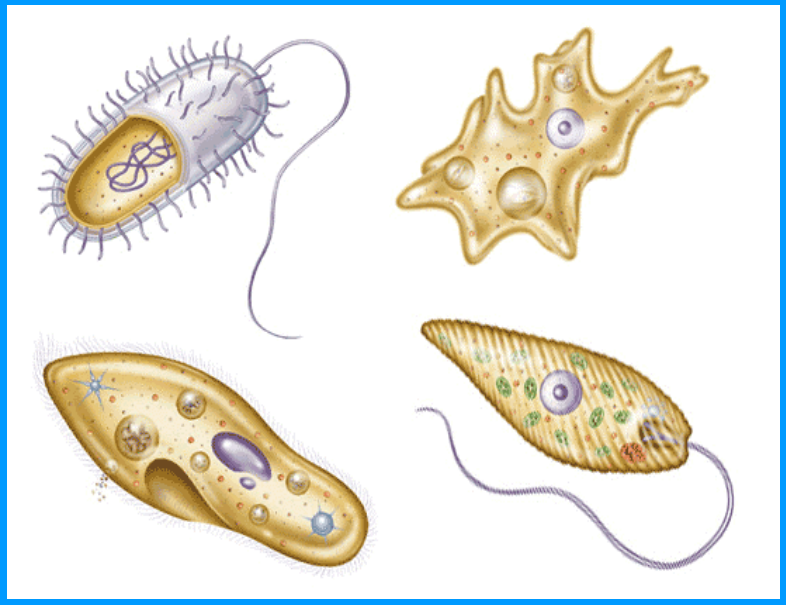
4 ER

8 Ribosome

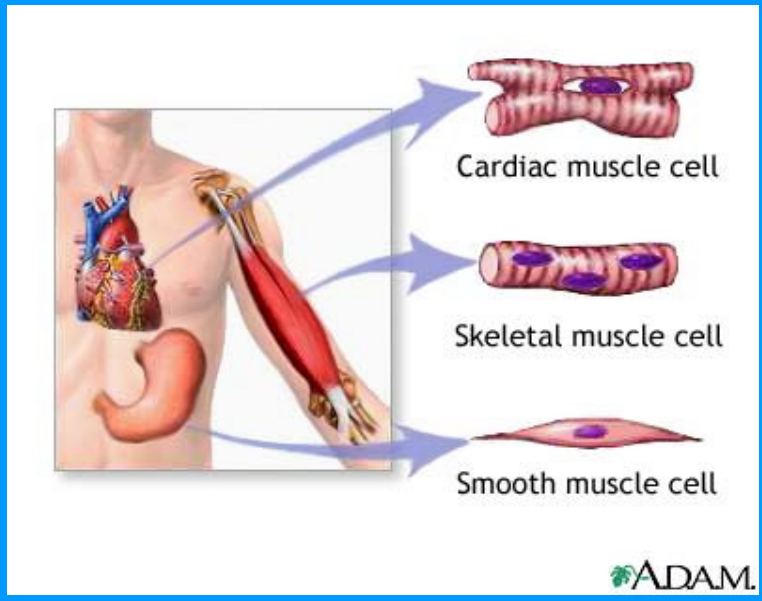
Cell Wall 12

Cell Membrane 10

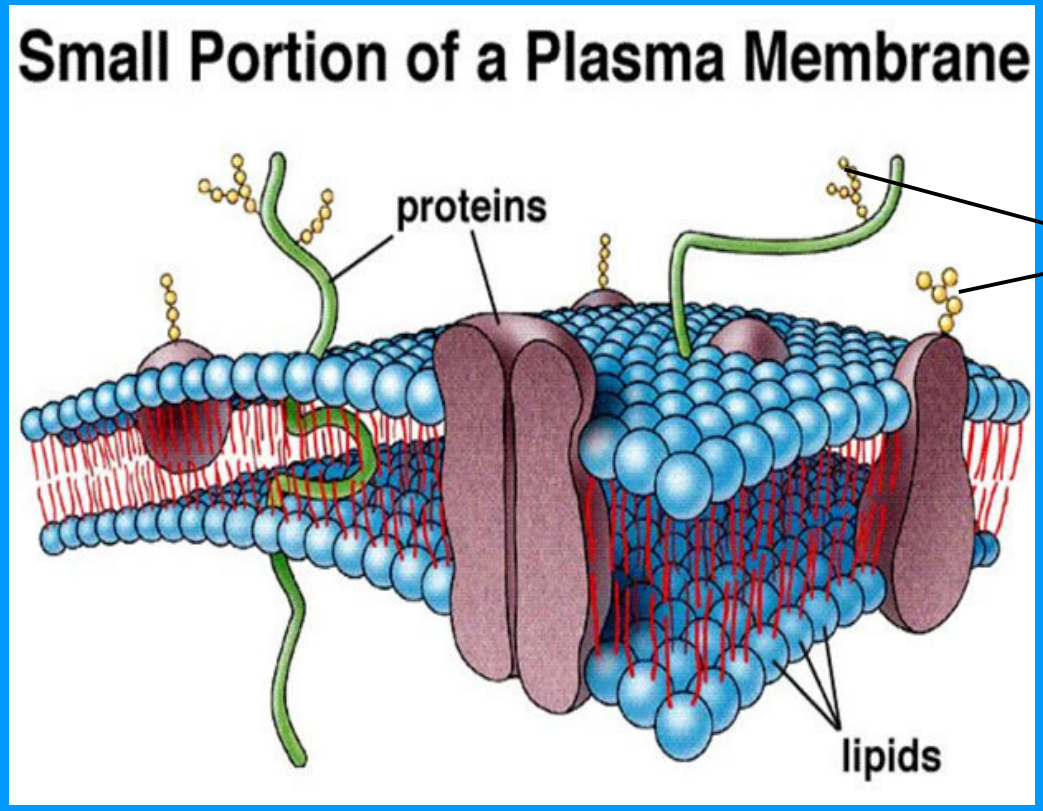
Unicellular vs. Multicellular



vs.



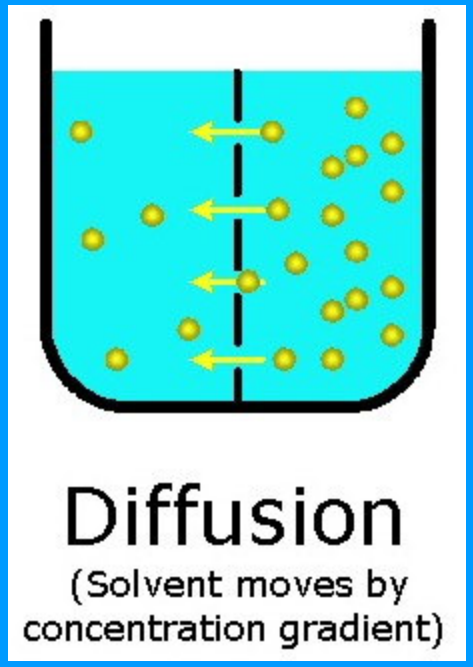
Cell Membrane – Fluid Mosaic Model



Cell Markers
(Receptors)

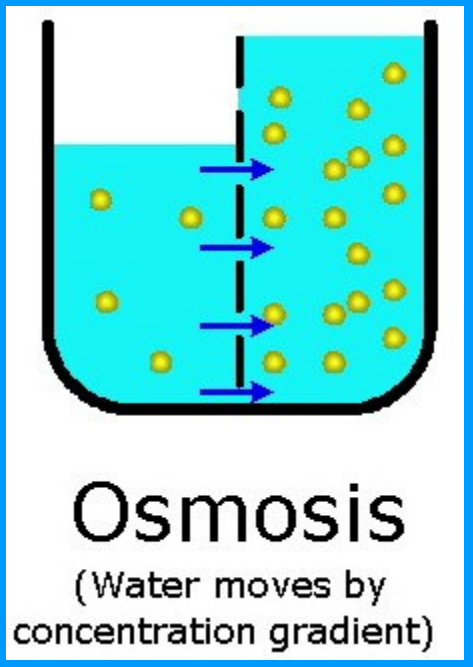
Major Types of Cellular Transport

Passive Transport



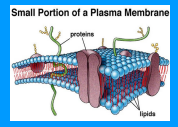
Diffusion

(Solvent moves by concentration gradient)



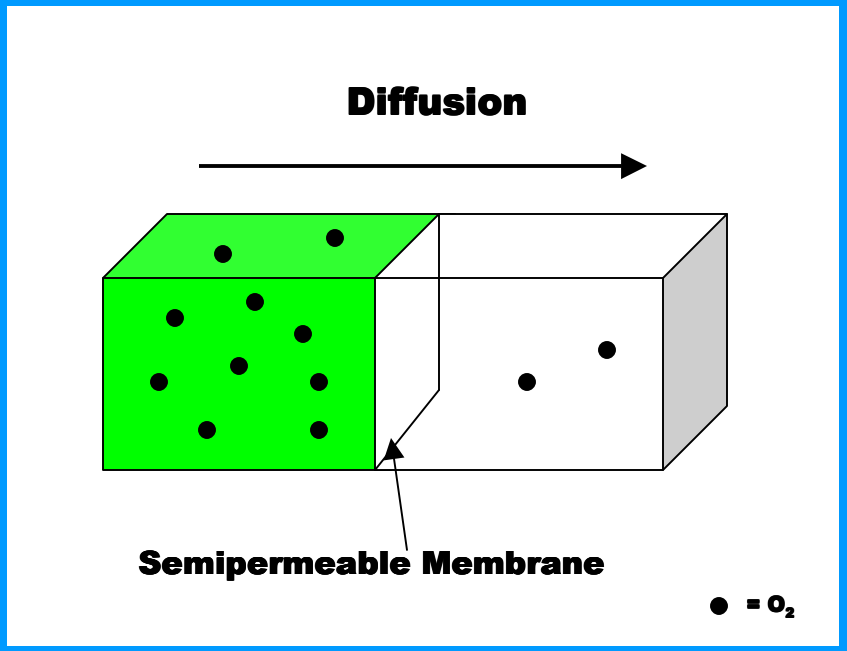
Osmosis

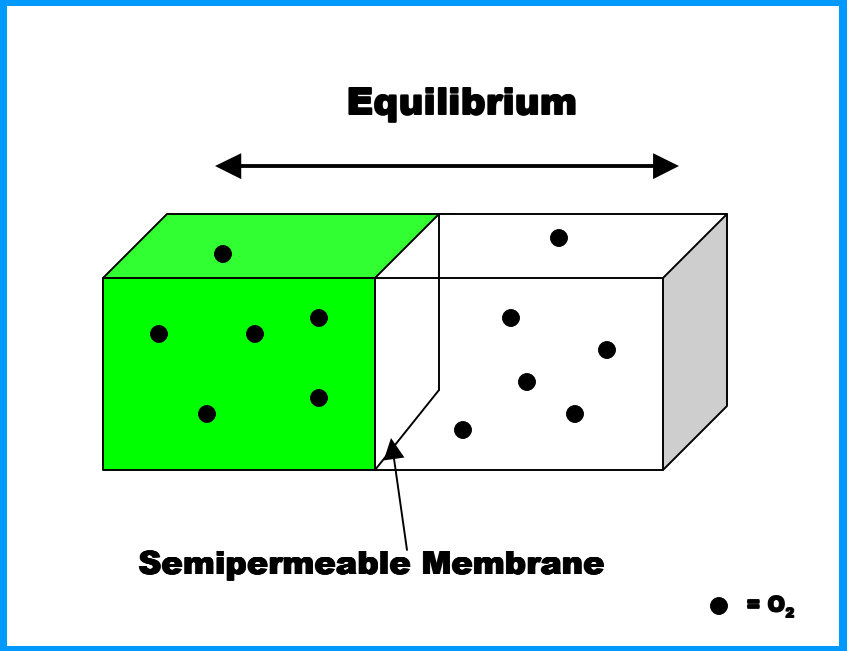
(Water moves by concentration gradient)

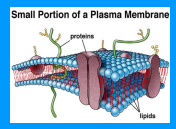


Major Types of Cellular Transport

Diffusion

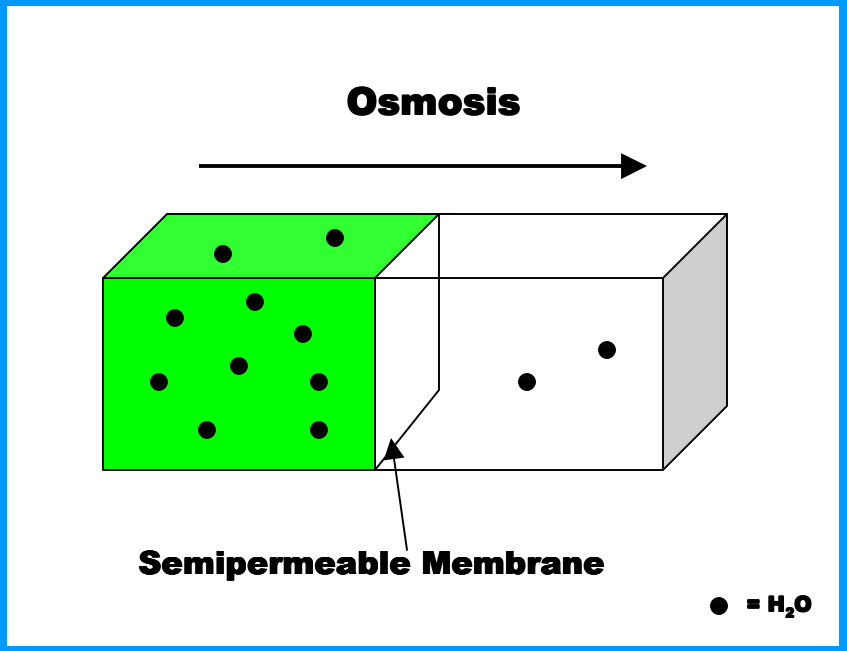


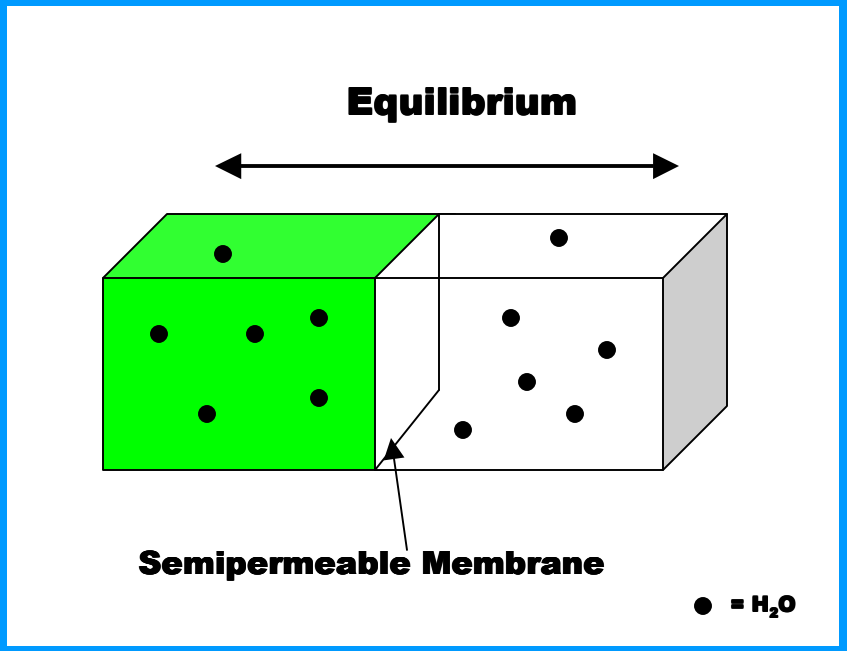


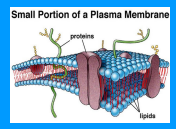


Major Types of Cellular Transport

Osmosis

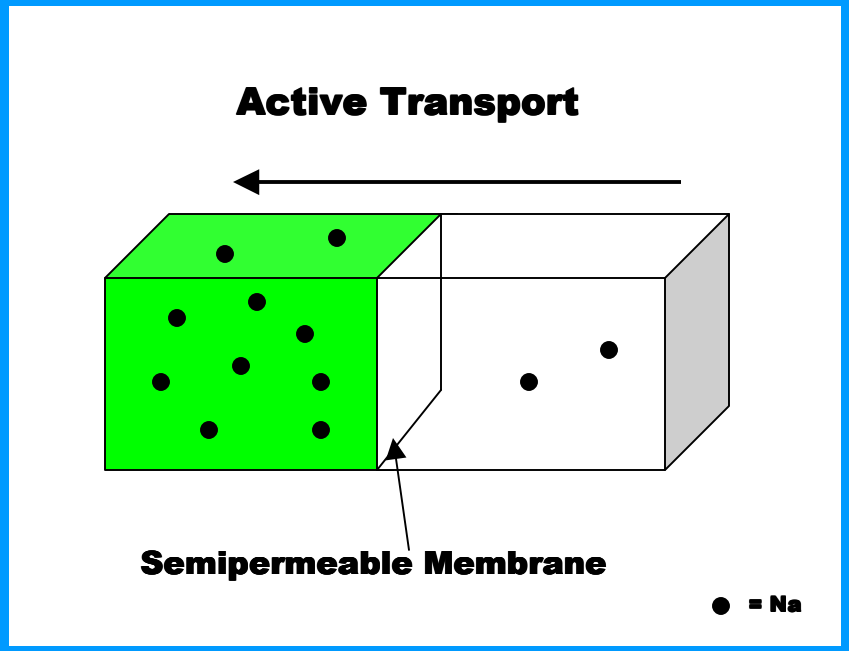


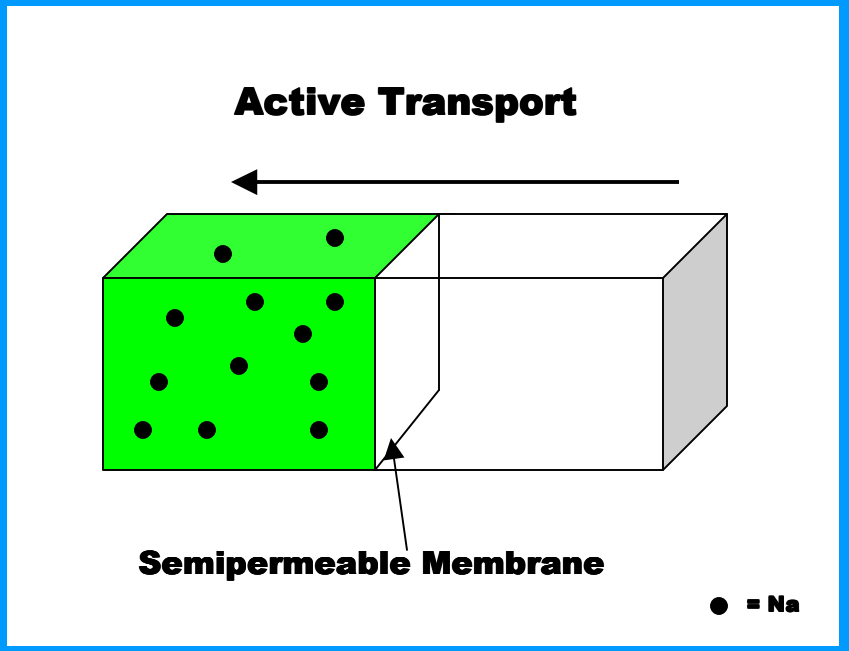


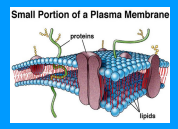


Major Types of Cellular Transport

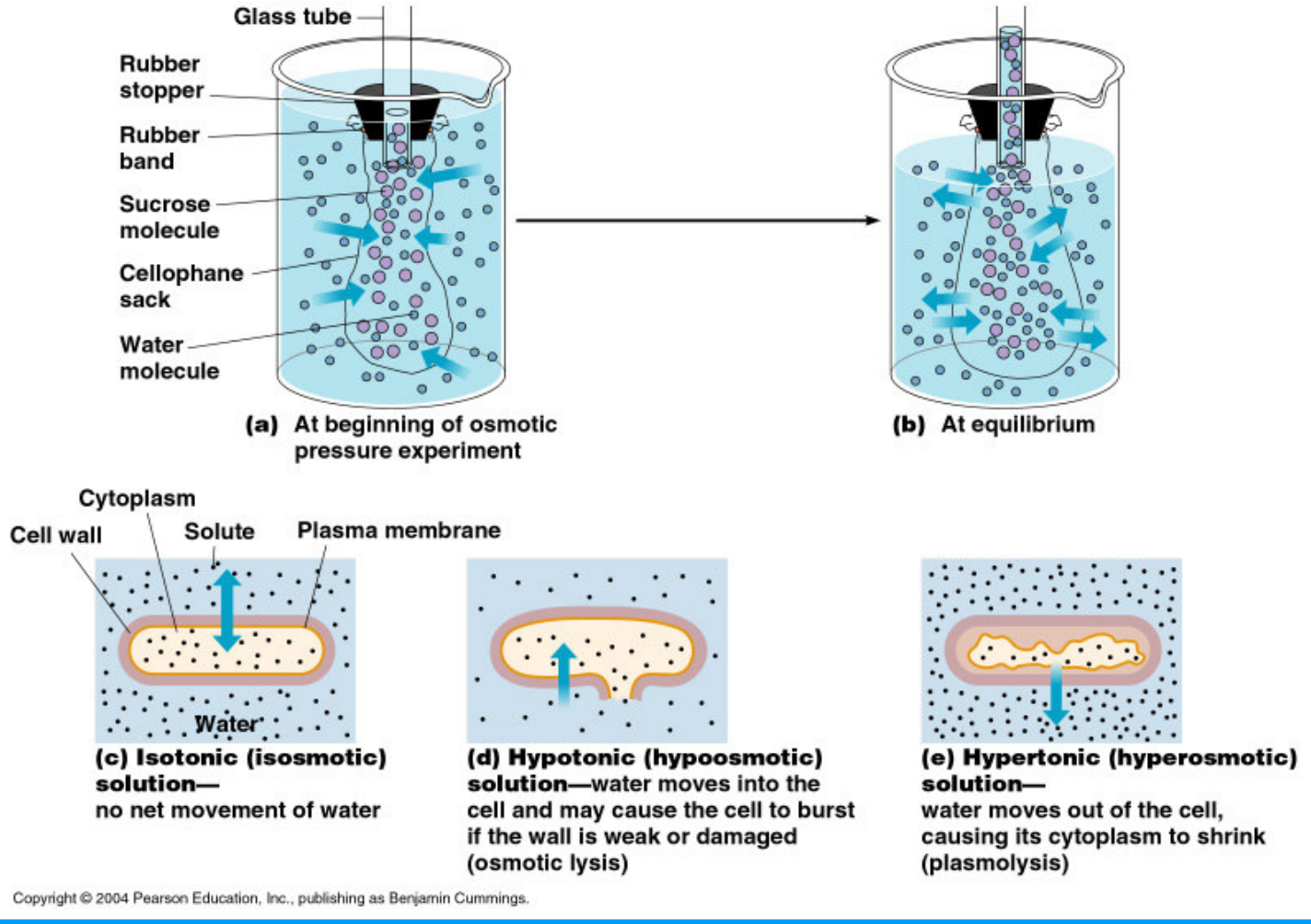
Active Transport

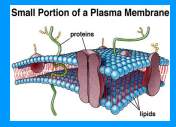




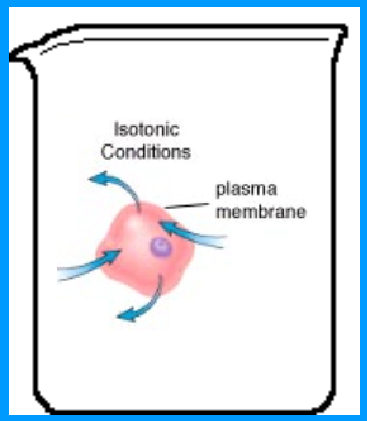


Osmosis – Effect of Different Solutions on Cells





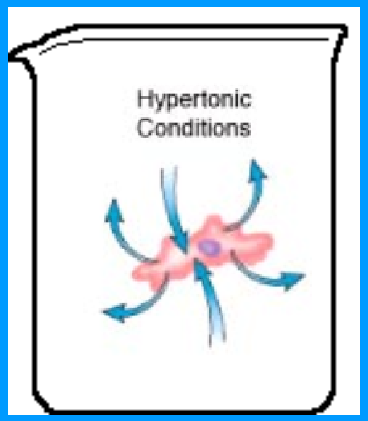
Osmosis – Effect of Salt Solutions on Cells



Isotonic Solution

- **Equal % solute and solvent as cell**

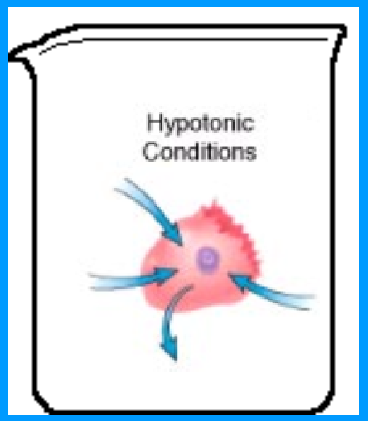
99% H_2O
1% Salt



Hypertonic Solution

- **Higher % solute Lower % solvent than cell**

95% H_2O
5% Salt



Hypotonic Solution

- **Lower % solute Higher % solvent than cell**

100% H_2O
0% Salt