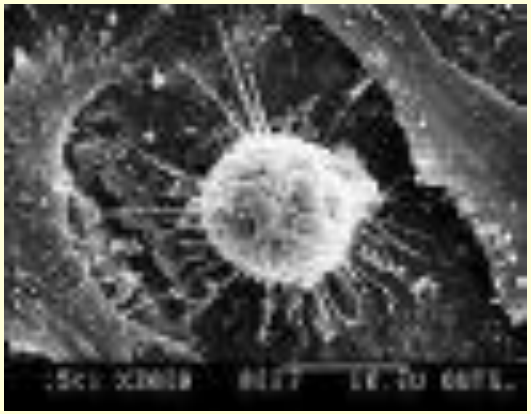
The Cell

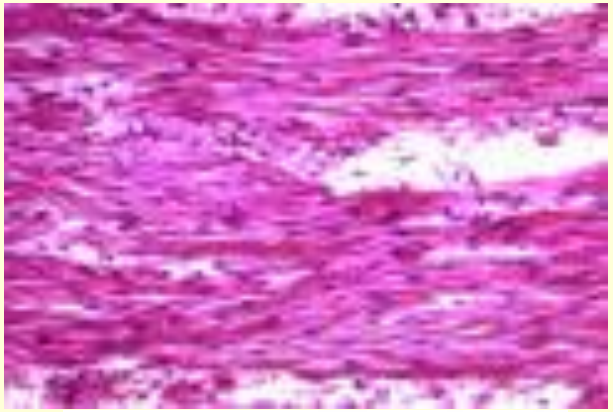
The cell is the smallest unit of life

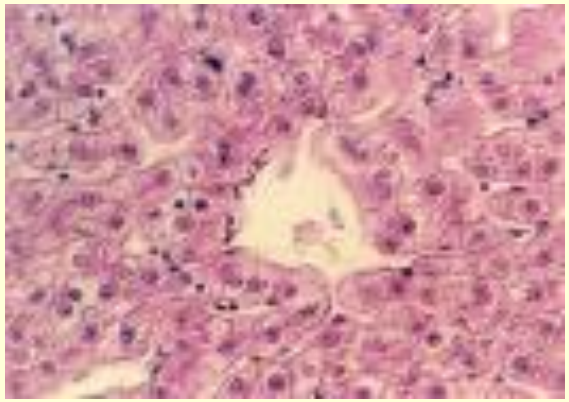
Cells make up Tissue,

Tissue makes up Organs, Organs make up Systems, and Systems make up the organism

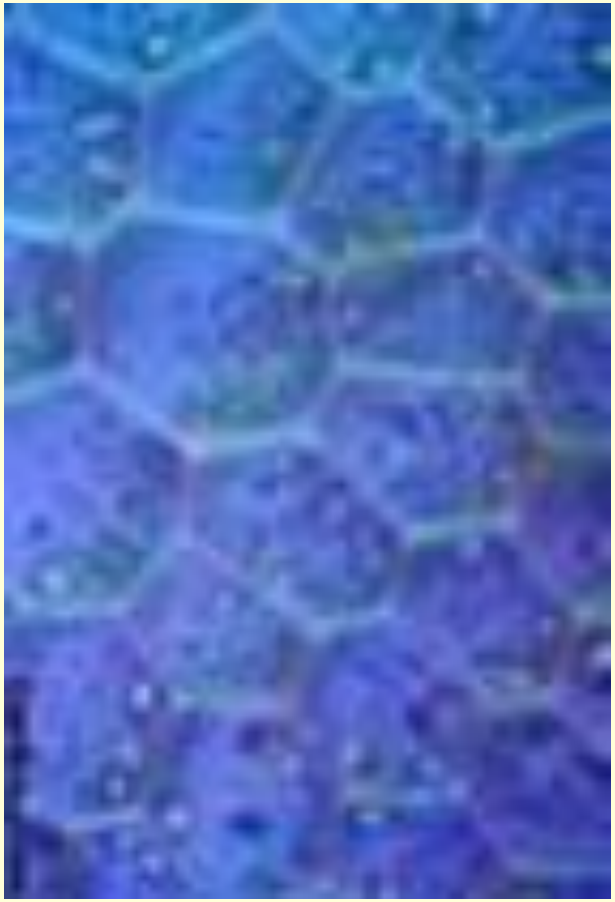
Animal Cells –
many shapes and sizes





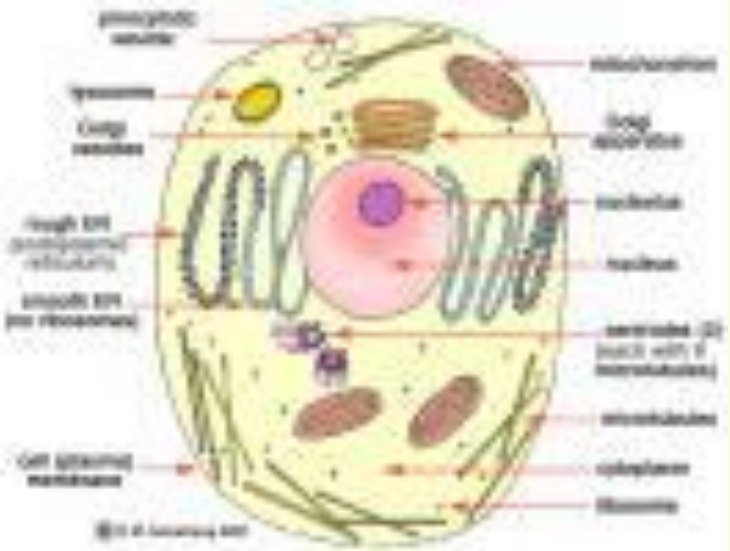


Plant Cells –
typically rectangular



Organelles

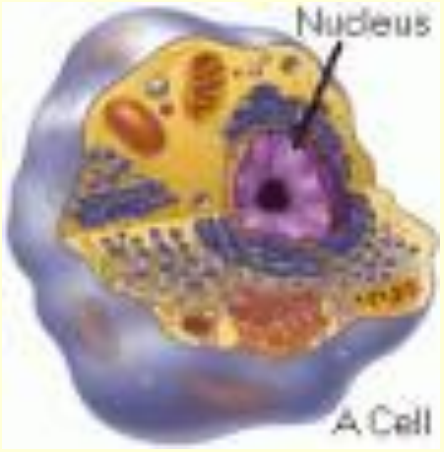
Internal parts of a cell

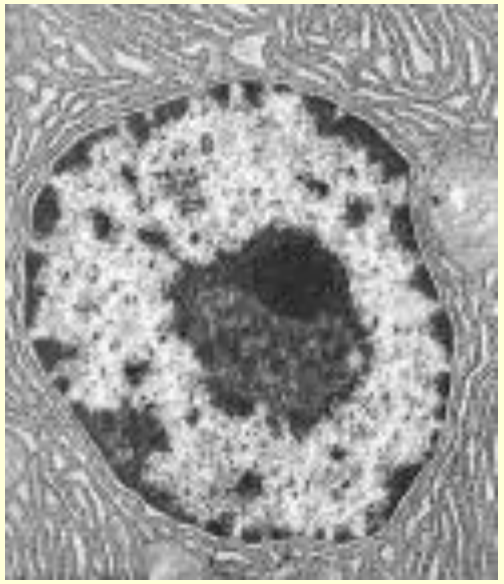


So, what in the cell is going on?

Nucleus

- The “brain”/control center of the cell
- Contains DNA
- Controls all other organelles
- Central Office





Eukaryote vs Prokaryote

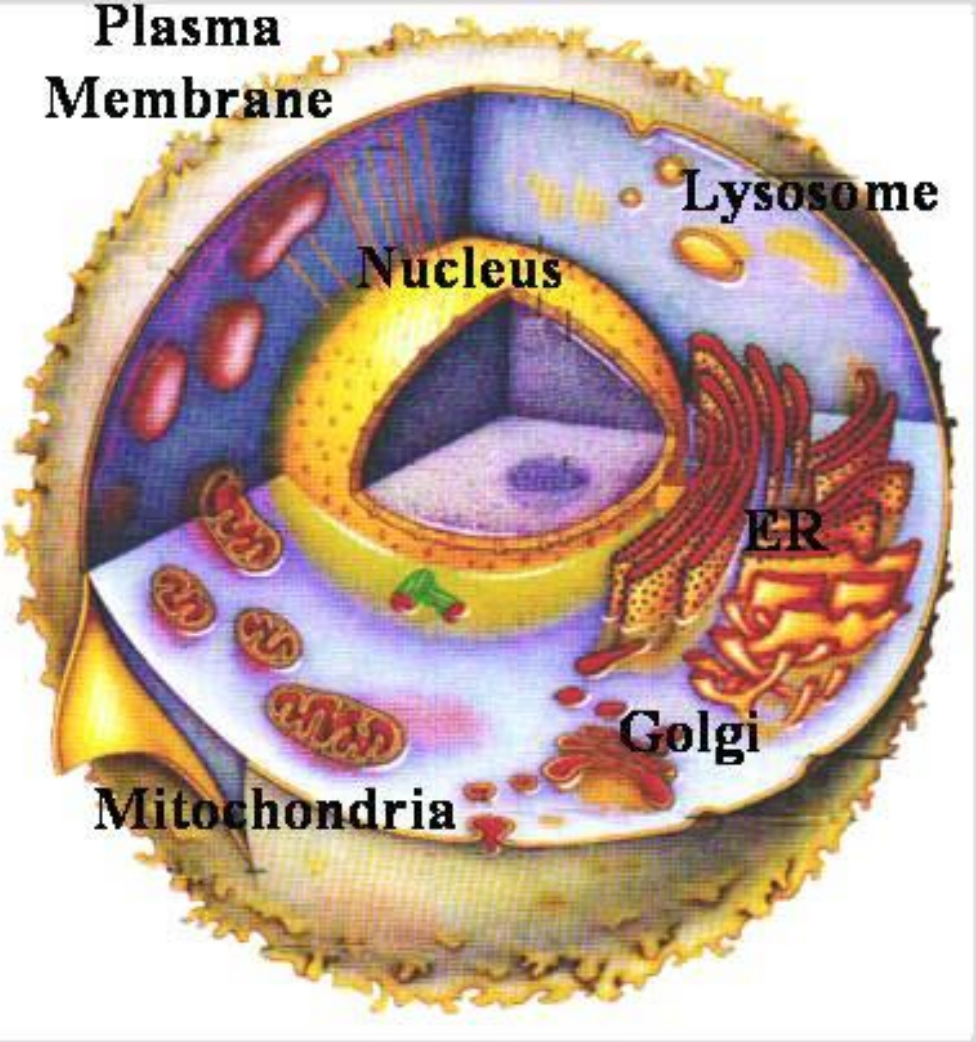
Nucleus

Protists, Fungi
Plants, Animals

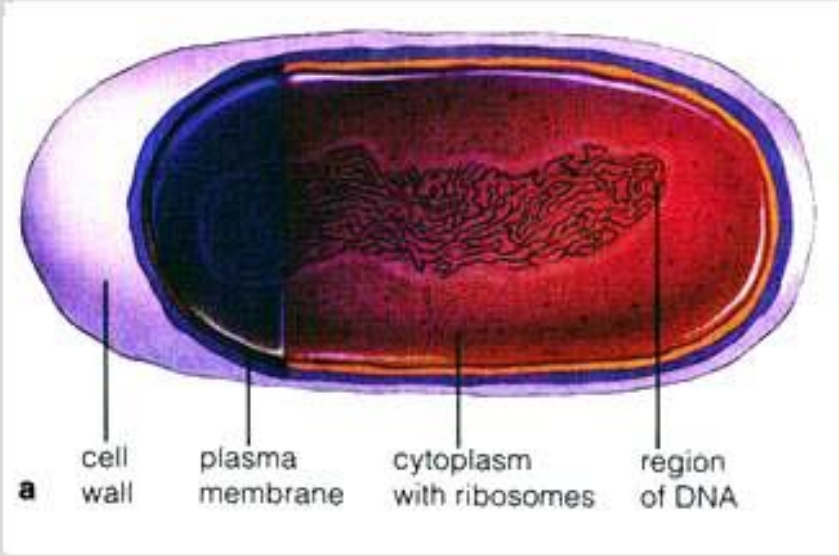
No Nucleus

Bacteria

Eukaryote vs Prokaryote

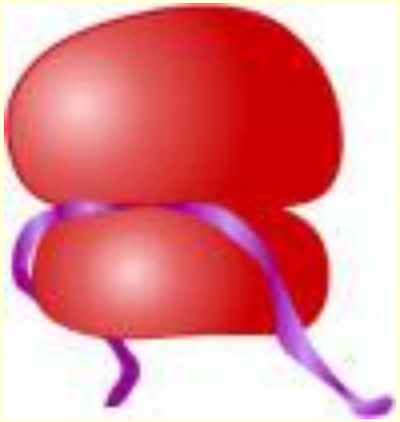


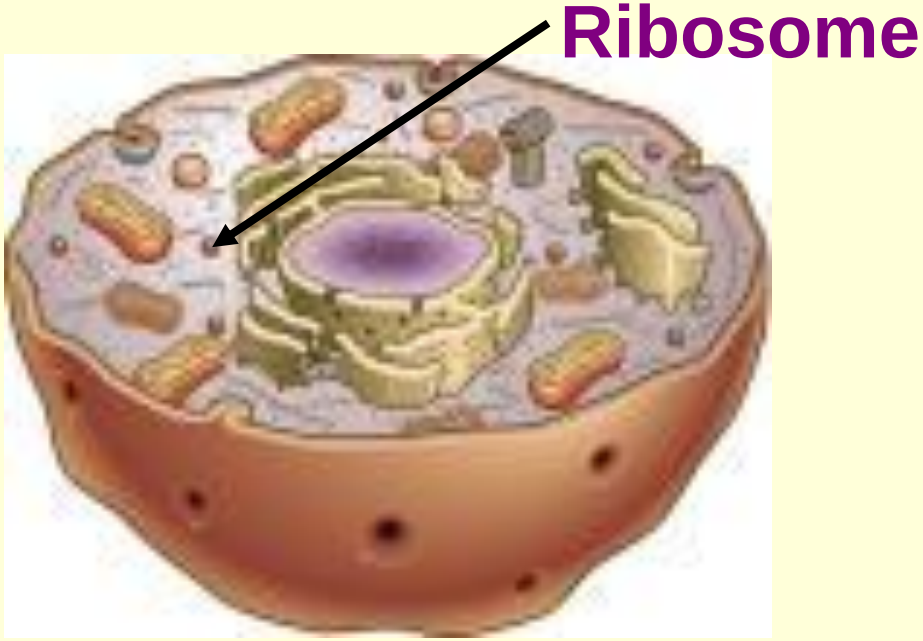
Eukaryotic cells have membrane-bound compartments with specialized functions.



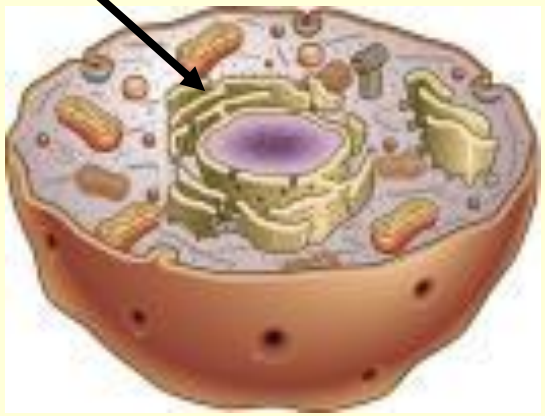
Ribosomes

- Smallest organelle
- Free-floating or attached to the ER
- Site of protein synthesis
- Assembly Line



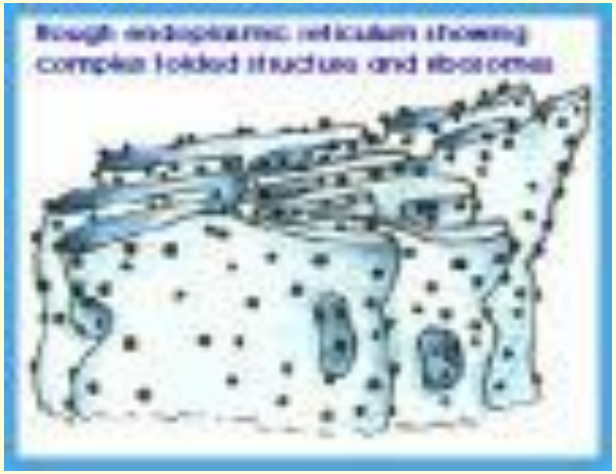


Endoplasmic Reticulum (ER)



- Interconnected channels for shipping and transport of proteins throughout cell
- Shipping Center

Rough ER vs Smooth ER



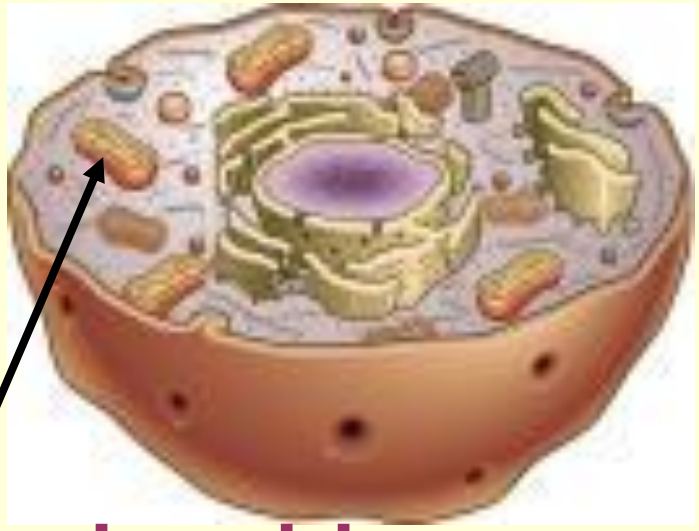
Ribosomes Attached

No Ribosomes Attached

Golgi Apparatus

- Modifies, packages, distributes proteins
- Repair and Packaging
- Discovered by Camillo Golgi

Mitochondria



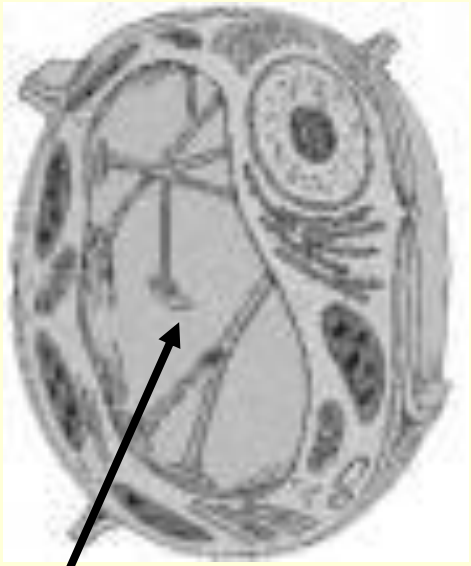
Mitochondrium

- Provides energy for cell functions
- Contains its own genetic material to reproduce (why?)
- Generator

Vesicle (animal)/Vacuole (plant)

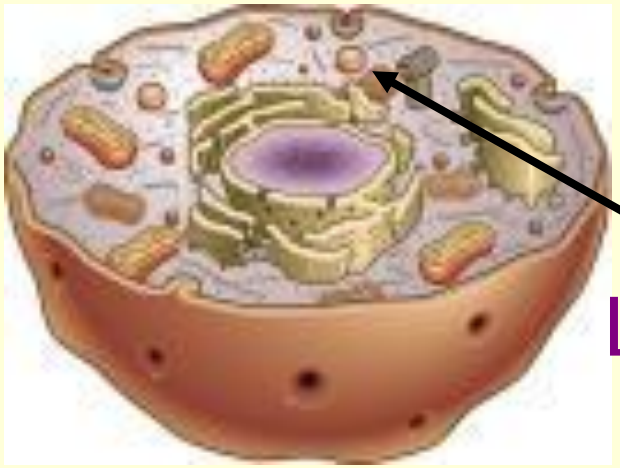
- Storage for food, enzymes and waste
- Animal cells have many small vesicles
- Plant cells have one large vacuole
- Storage Facility

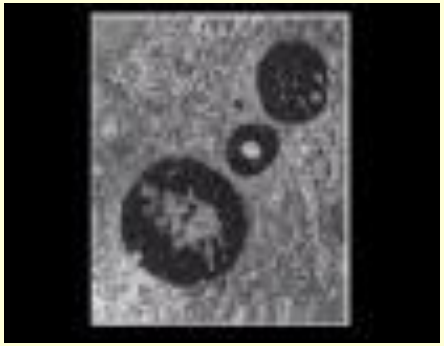
Animal Vesicle



Plant Vacuole

Lysosome

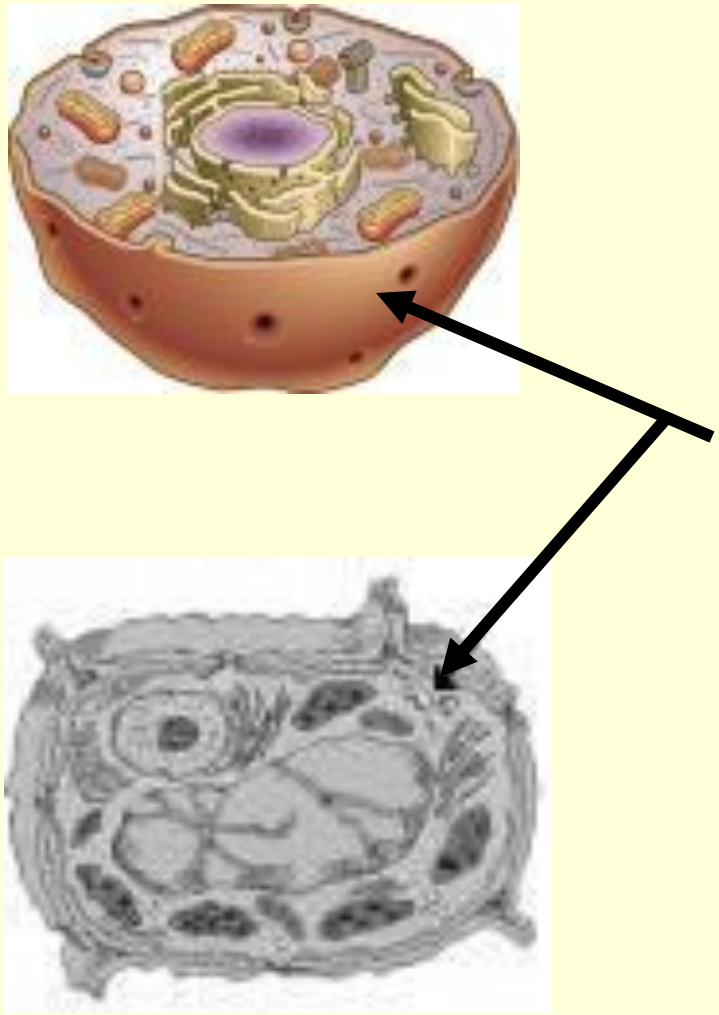




- Digests unused organelles, bacteria, viruses
- Cleans cell of debris
- Contains digestive enzymes
- Janitor
- ANIMAL cells ONLY

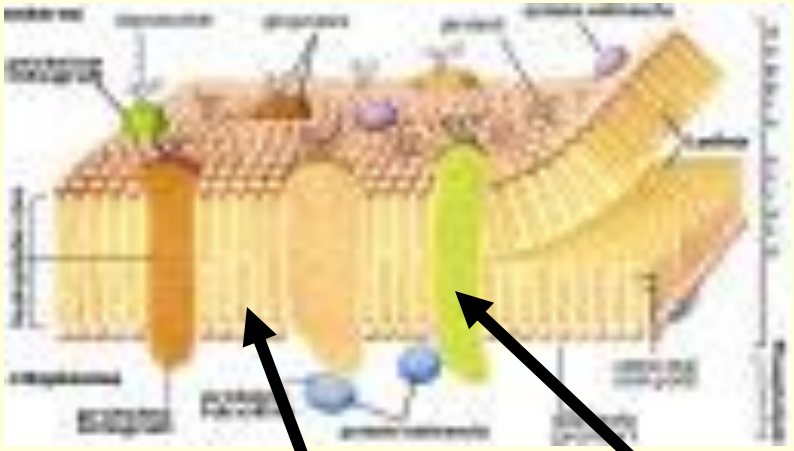
Cell Membrane

- Regulates what enters and leaves the cell
- Double layer of lipids embedded with proteins
- Security

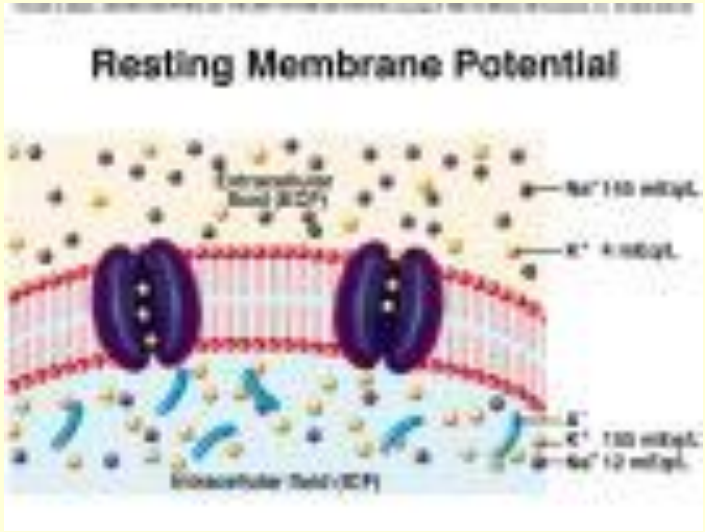


Semipermeable Membrane

- Allows only certain things to pass through
- “Selectively” permeable



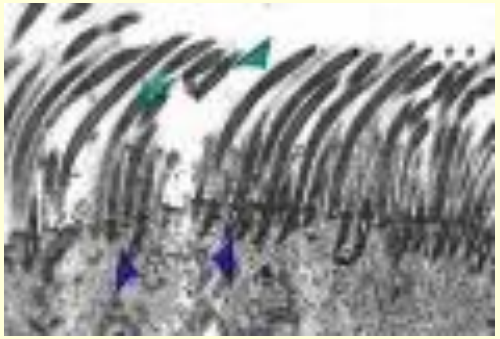
Lipids Proteins



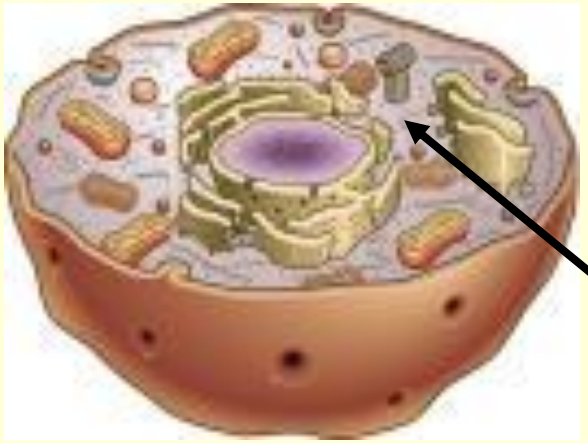
Extensions of Cell Membrane for Mobility

- Flagella

- Cilia



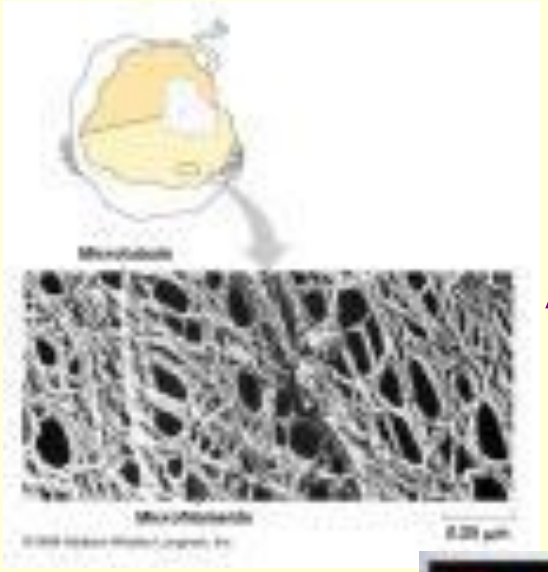
Cytoplasm



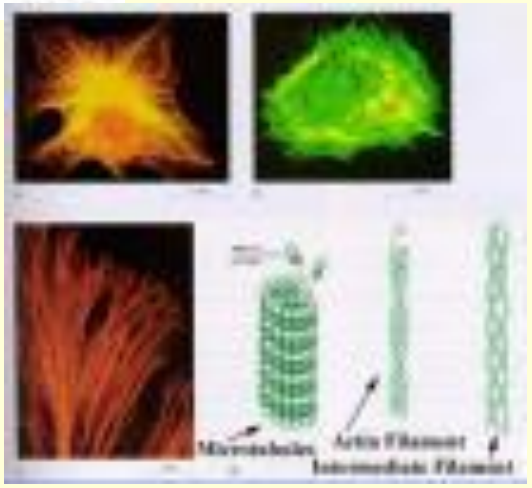
- Clear fluid inside cell that supports organelles
- Support Staff

Cytoskeleton

- Provides strength, shape, movement
- Walls, Structure



Animal



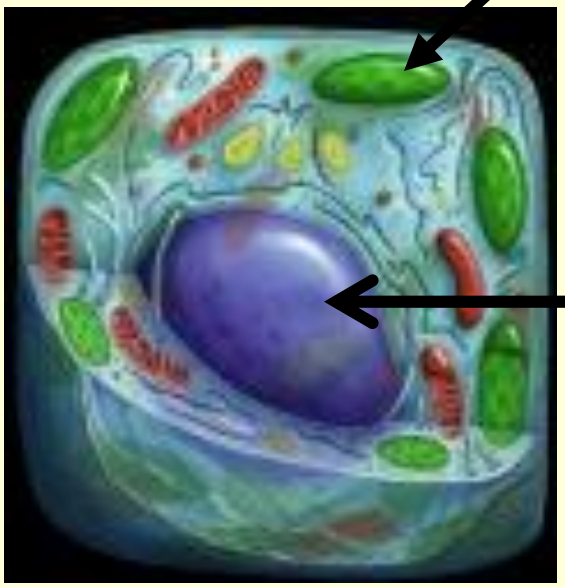
Plant

The following are in **PLANTS ONLY**

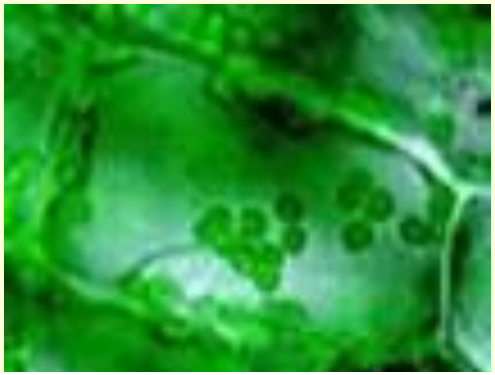
- Chloroplast
- Cell Wall
- Large vacuole

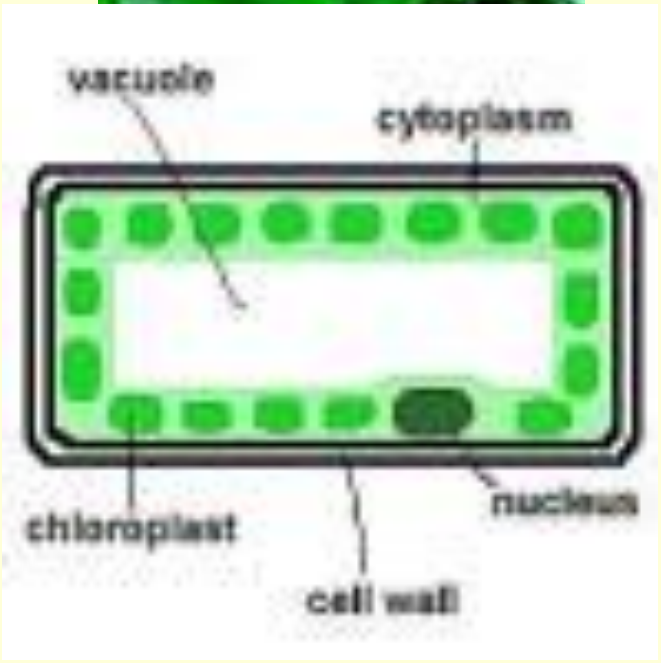
Chloroplast

- Provides energy for the cell using sunlight
- Green in color
- Contains its own genetic material to reproduce
- Usually around vacuole
- Generator



Cell Wall





- Provides support and structure for plant
- Surrounds cell membrane
- Building Outer Walls

Which is more efficient?

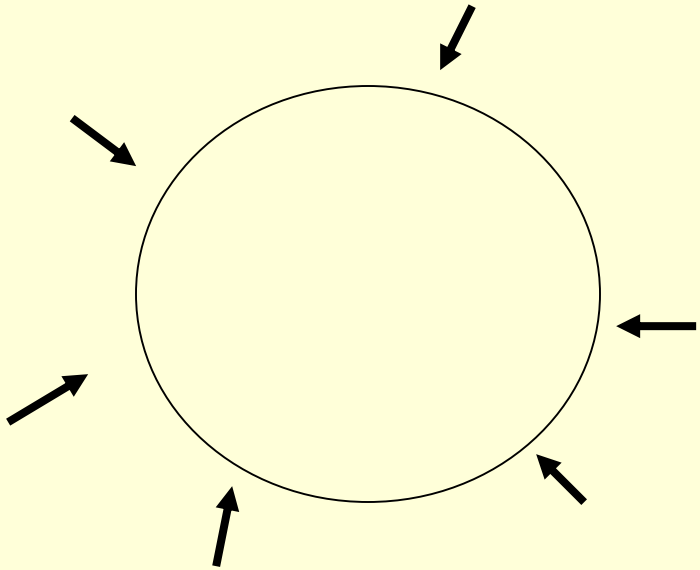
Many small cells?

OR

Few large cells?

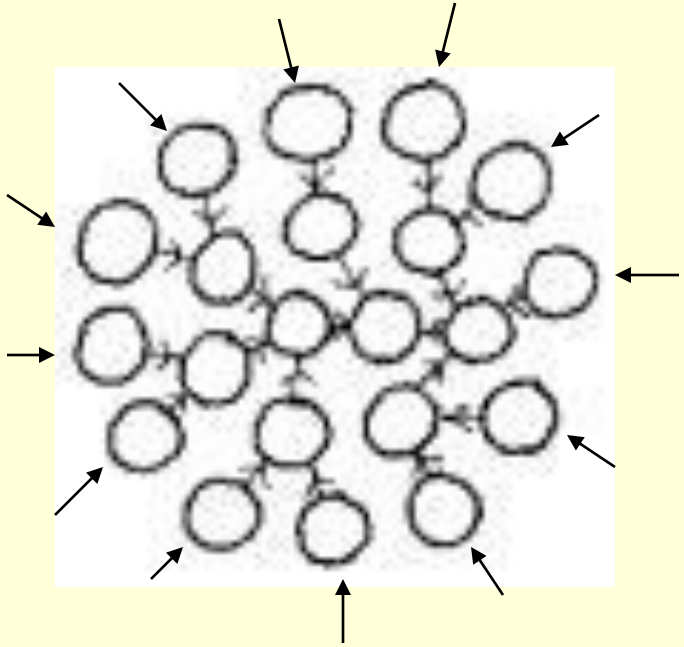
Large cells . . .

- have little surface area
- generally have ONE function



Small cells . . .

- have increased surface area
- are specialized for many different functions (blood, immune, nerve, etc)



So, which is more efficient?

Many small cells!