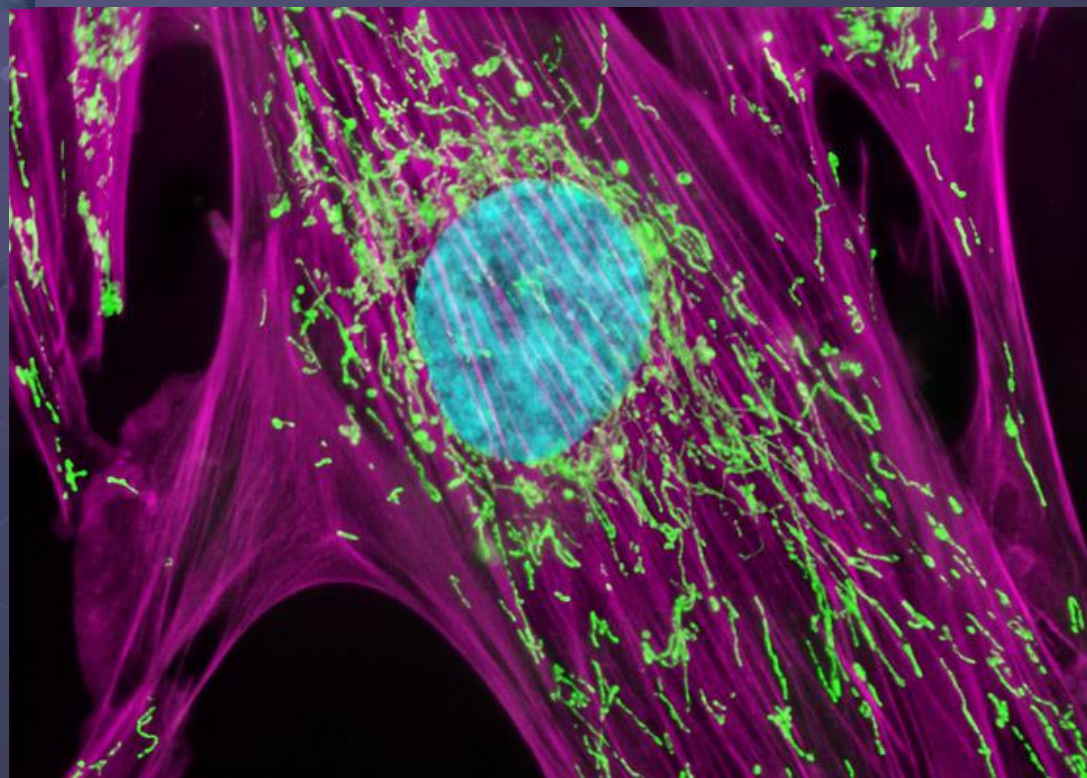
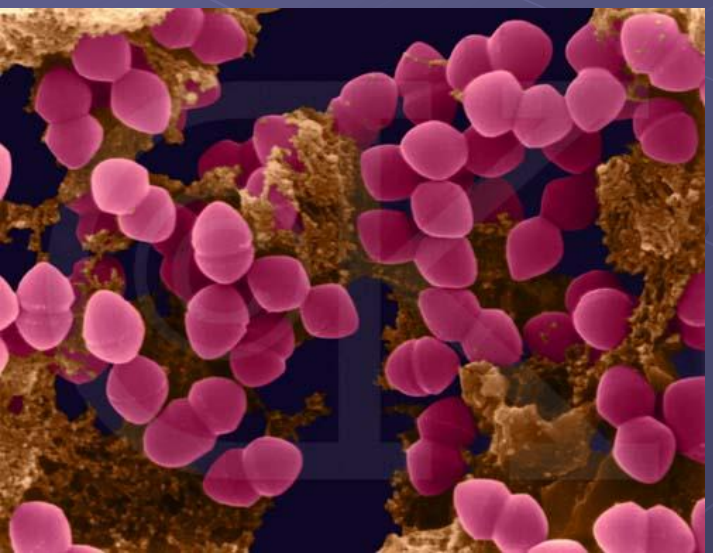
Cell Organelles

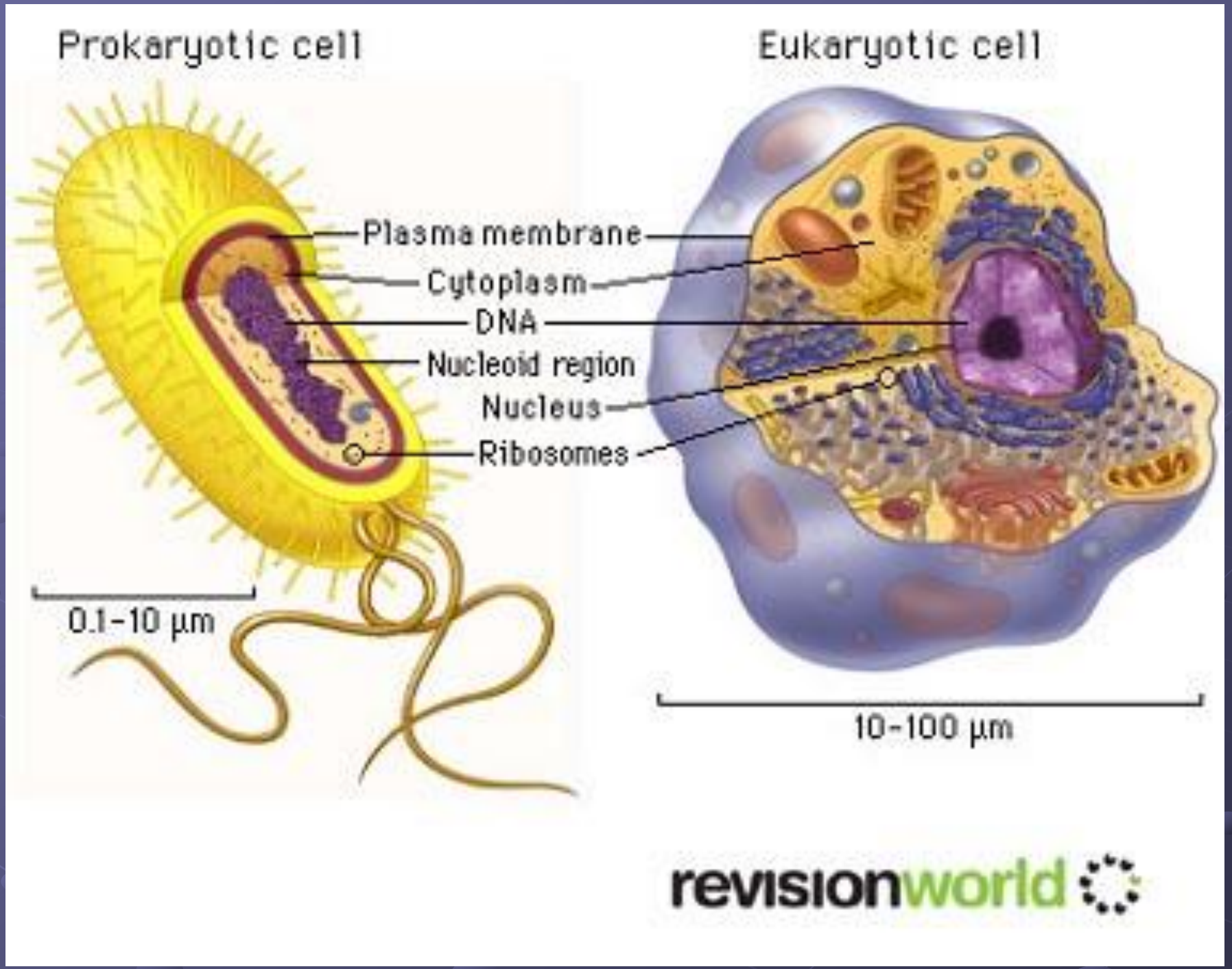
Standard: **S7L2. Students will describe the structure and function of cells, tissues, organs, and organ systems.**



Two cell types

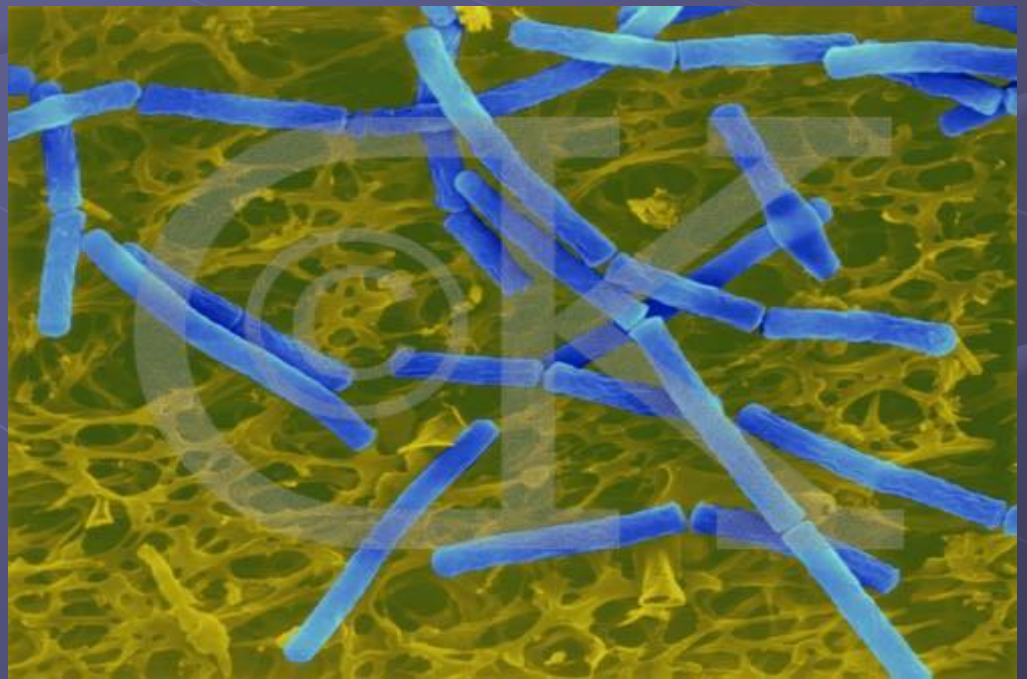
- Prokaryotes (Prokaryotic Cells)
- Eukaryotes (Eukaryotic Cells)

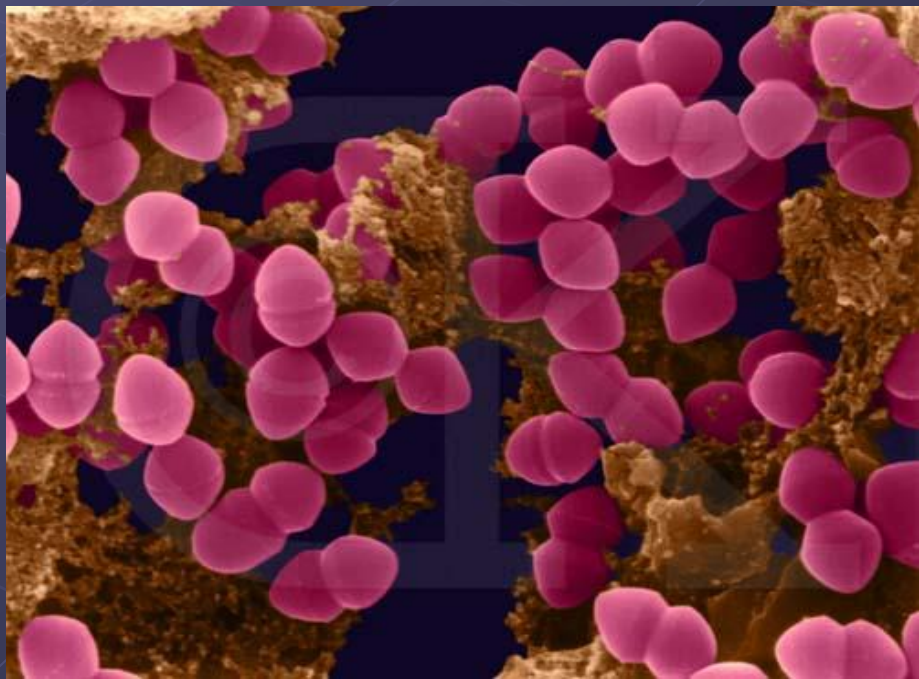


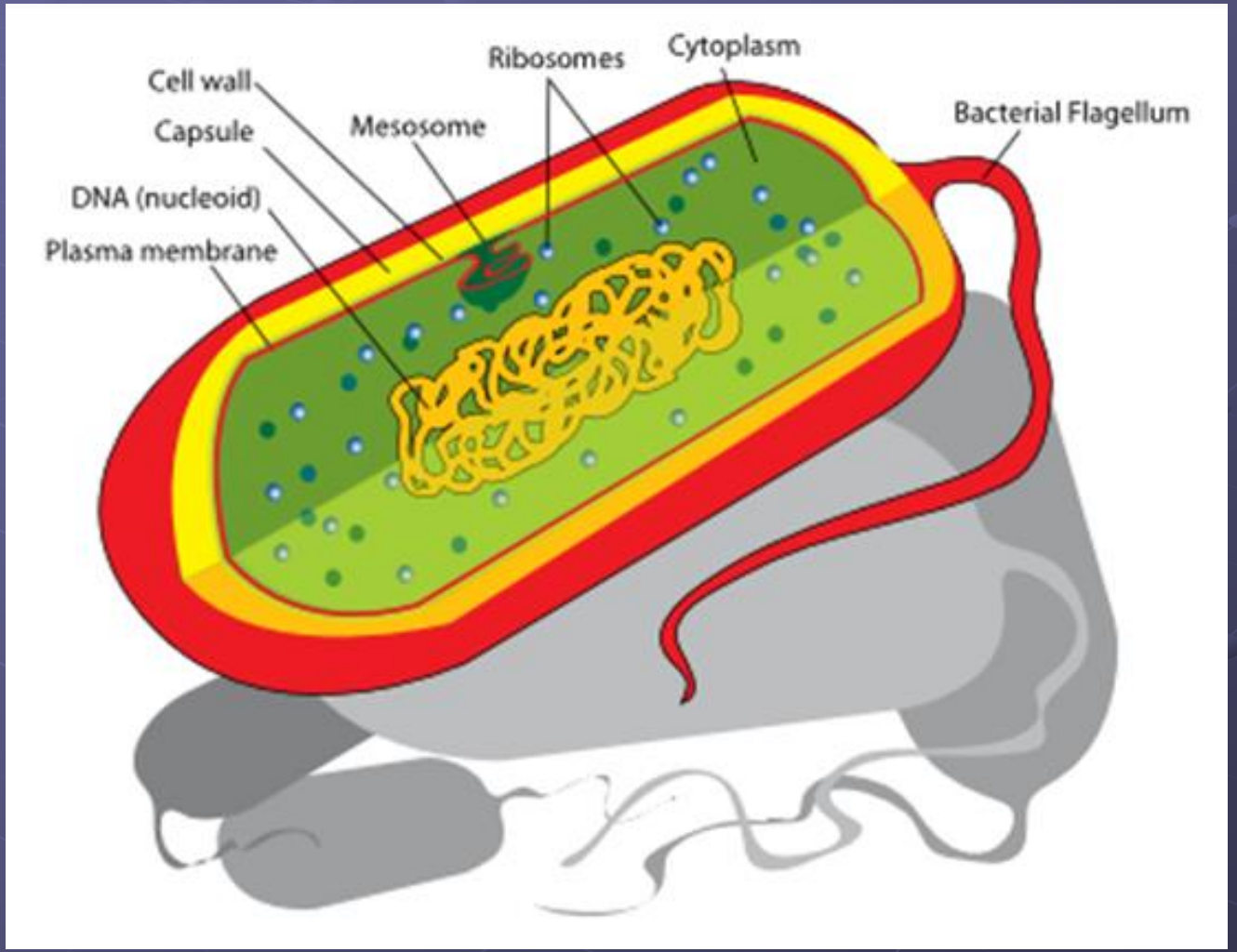

Prokaryotic cell
Eukaryotic cell
Plasma membrane
Cytoplasm
DNA
Nucleoid region
Nucleus
Ribosomes
0.1-10 µm
10-100 µm
revisionworld

Prokaryotes - Bacteria

- No Nucleus
- No Membrane bound organelles.
- Hereditary material is free to move throughout the cell. No nucleus.
- Only found in one-celled organisms (Ex) Bacteria





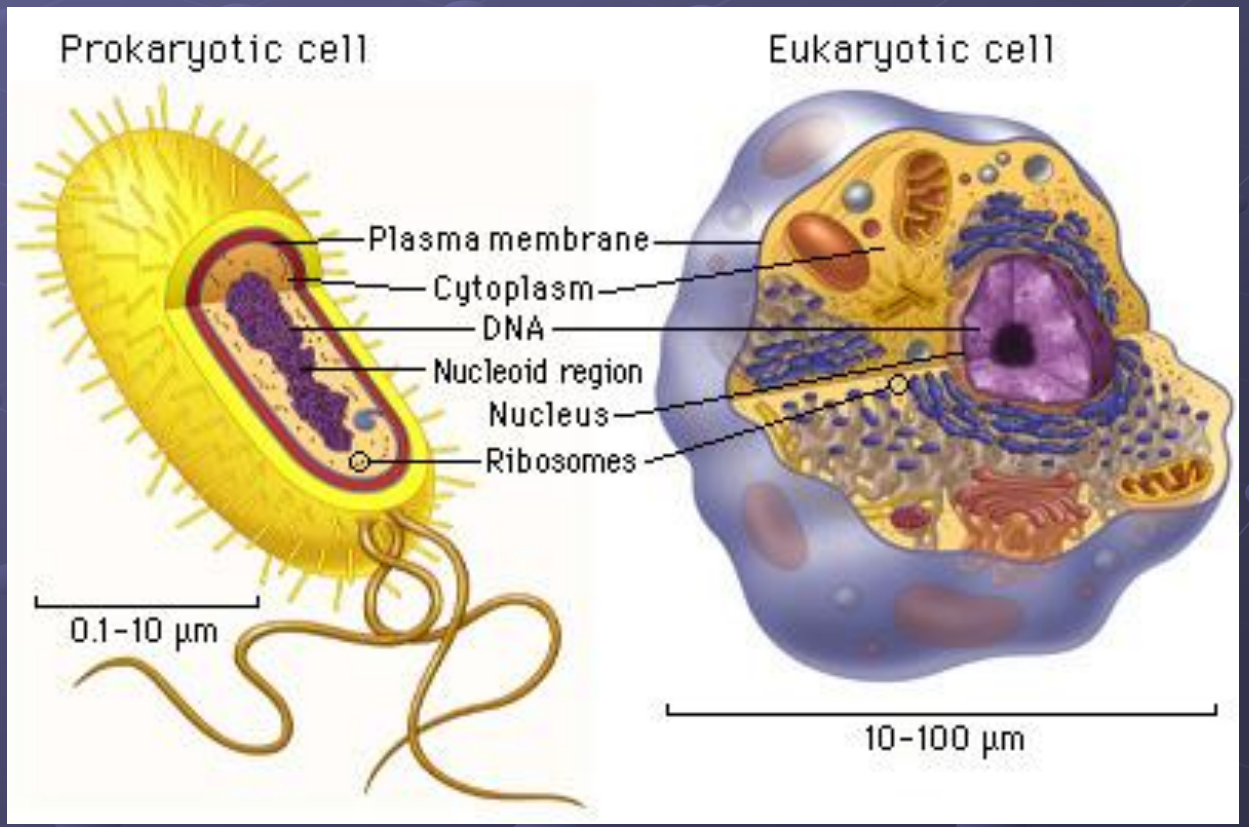

Cell wall
Capsule
DNA (nucleoid)
Plasma membrane
Mesosome
Ribosomes
Cytoplasm
Bacterial Flagellum

Eukaryotes

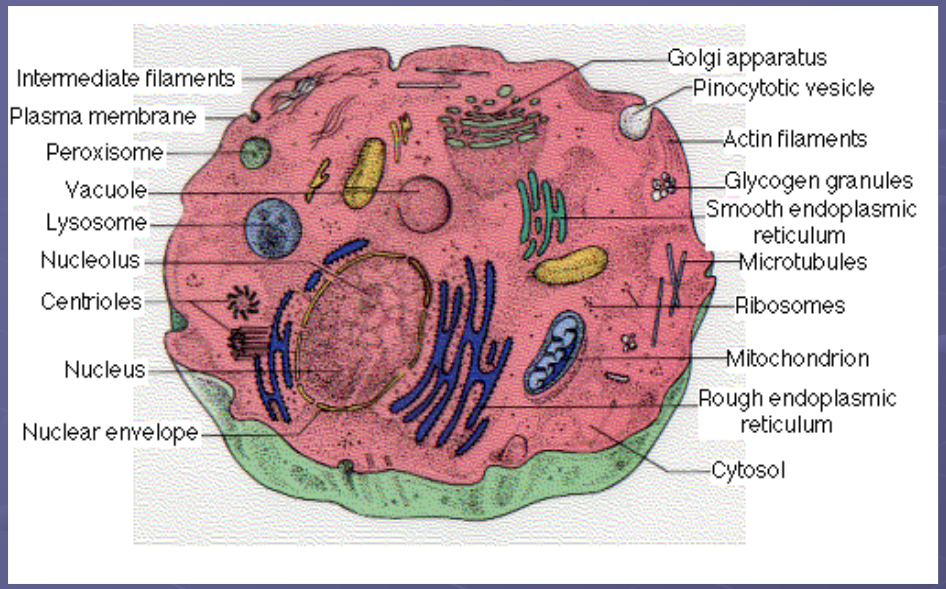
- Have a nucleus
- Have membrane bound organelles
- Hereditary material is bound within the nucleus and is unable to move throughout the cell.
- Make up multi-celled organisms. Ex) Protists, Fungi, Plants, and Animals

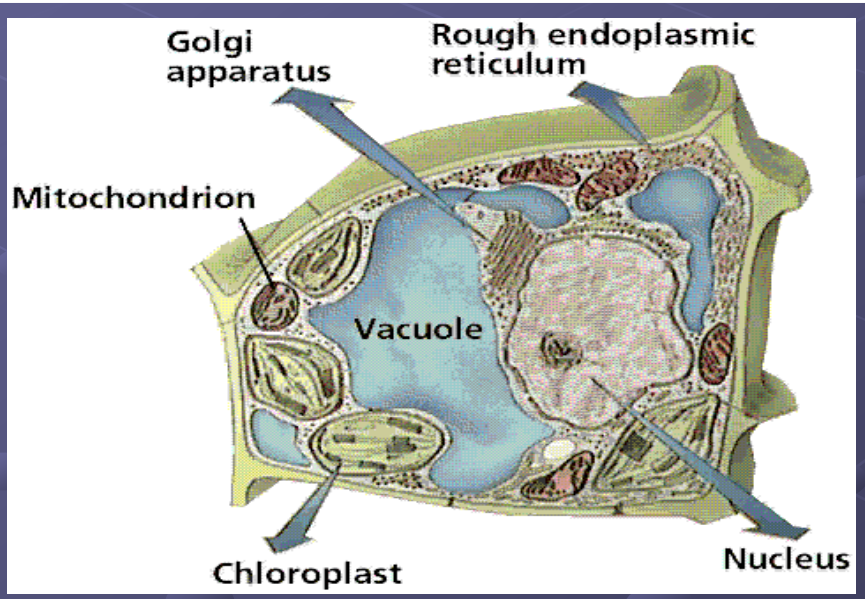
What do all cells have in common?

- Both prokaryotic and eukaryotic cells have a cell membrane, cytoplasm, ribosomes, and DNA.



Two Types of Eukaryotic Cells



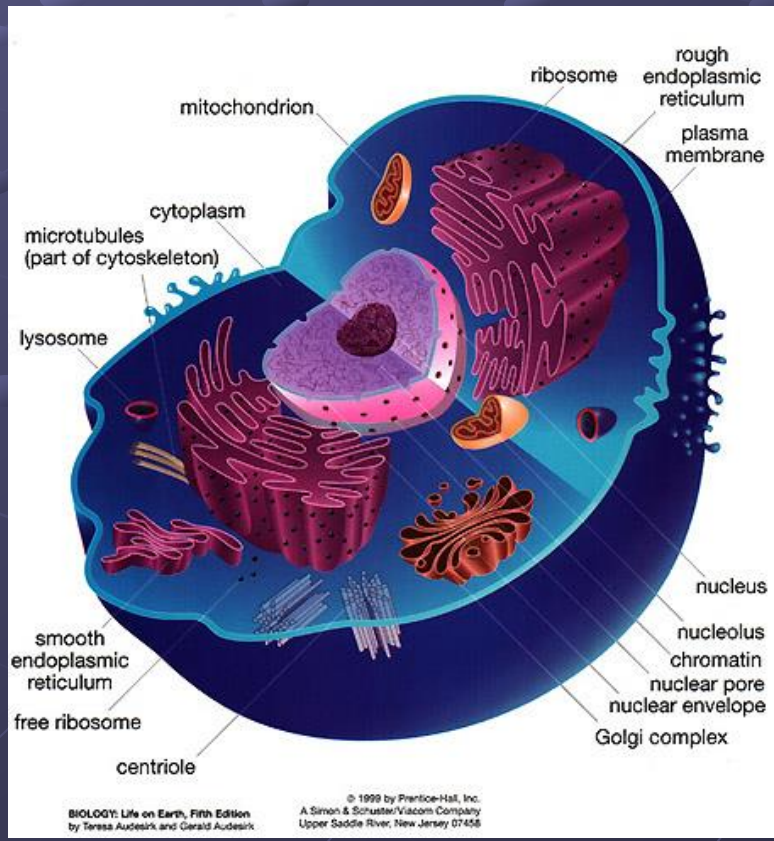


1. Animal Cell
2. Plant Cell

- Both cells function similarly

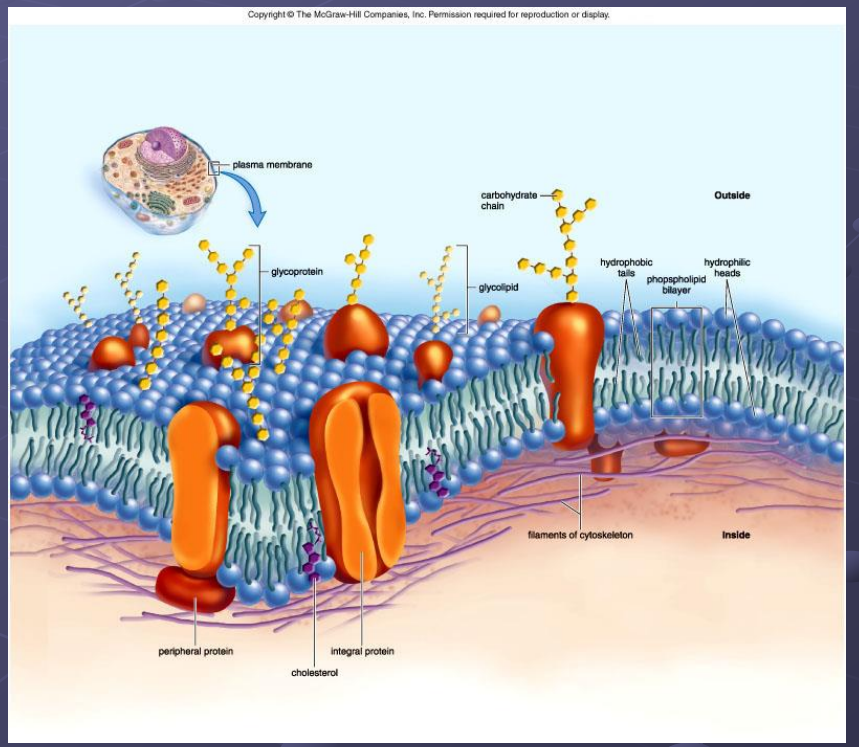
Cell Organelles

- **Organelle = "little organs"**
  - Specialized structures that perform specific jobs in the cell
- Found only in eukaryotic cells
- Many are "membrane-bound" (a membrane surrounds the organelle)
- All the stuff in between the organelles is cytoplasm or
- cytosol



Cell Membrane

- **Surrounds the cell** and **decides what comes in and out**
- **Semi-permeable**: allows nutrients in and waste products out
- Made of a **phospholipid bilayer**
- Also called **Plasma Membrane**



Nucleus

- **Control center of the cell**
- **Stores DNA** (chromosomes)
- Surrounded by the nuclear membrane
  - Pores let material in and out
- Also contains the **Nucleolus**, which makes ribosomes

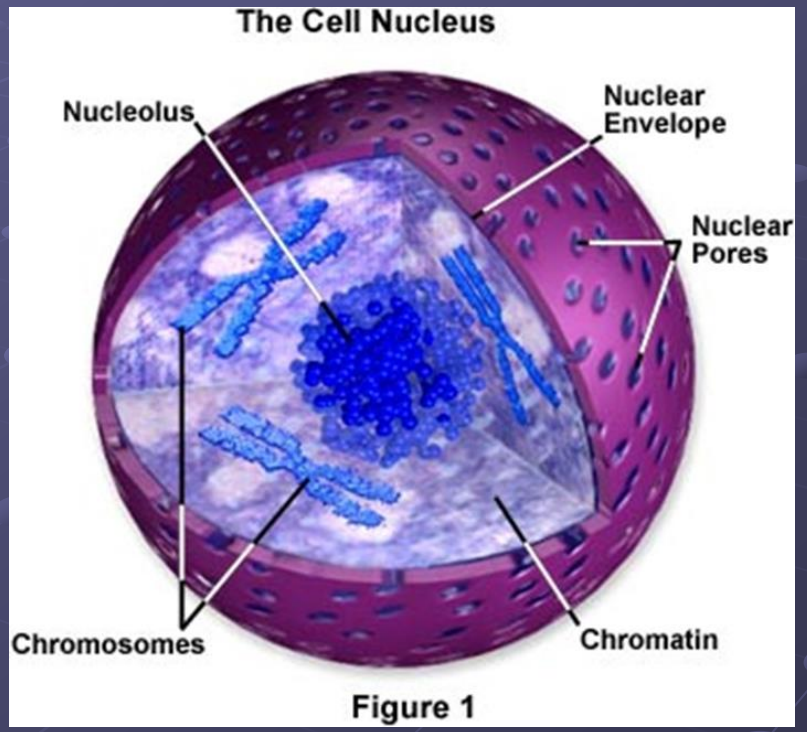
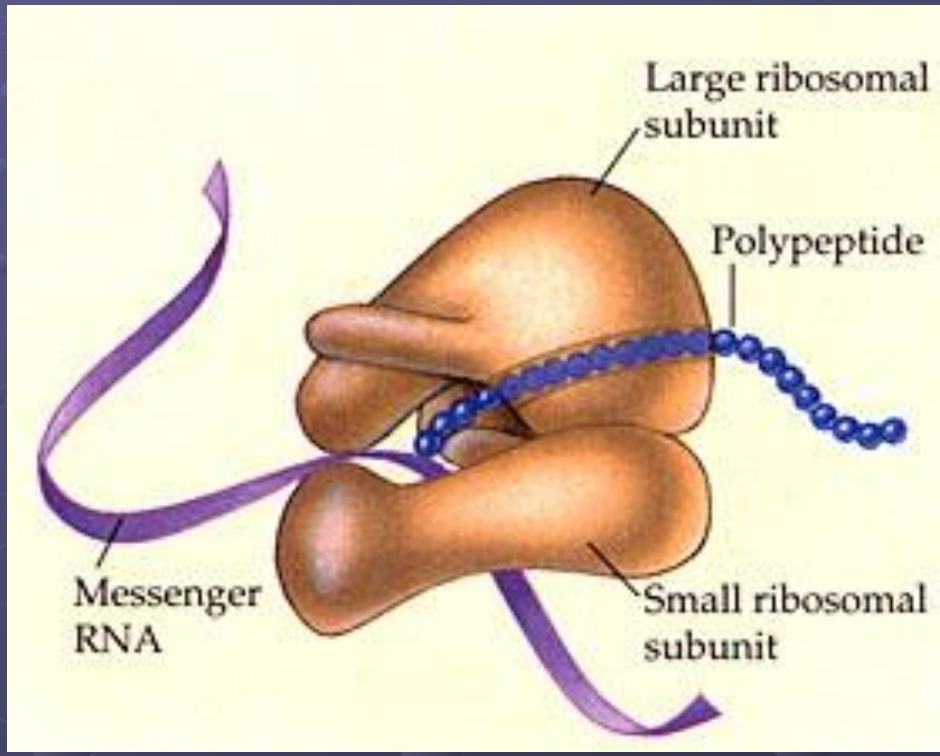


Figure 1

Ribosome

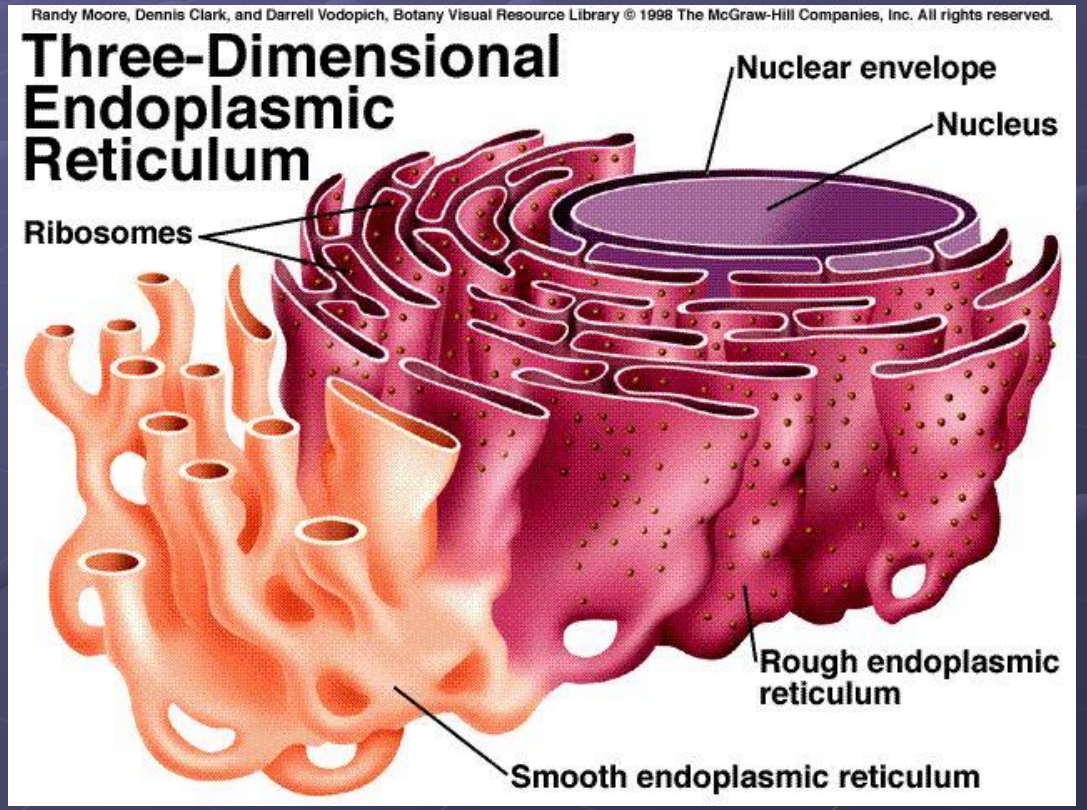
- Smallest organelle
- NOT surrounded by a membrane
- Makes proteins according to DNA instructions.
- Two Types:
  - Free ribosomes: float free in cytosol
  - Bound ribosomes: attached to rough ER



That looks familiar…what is a **polypeptide**?

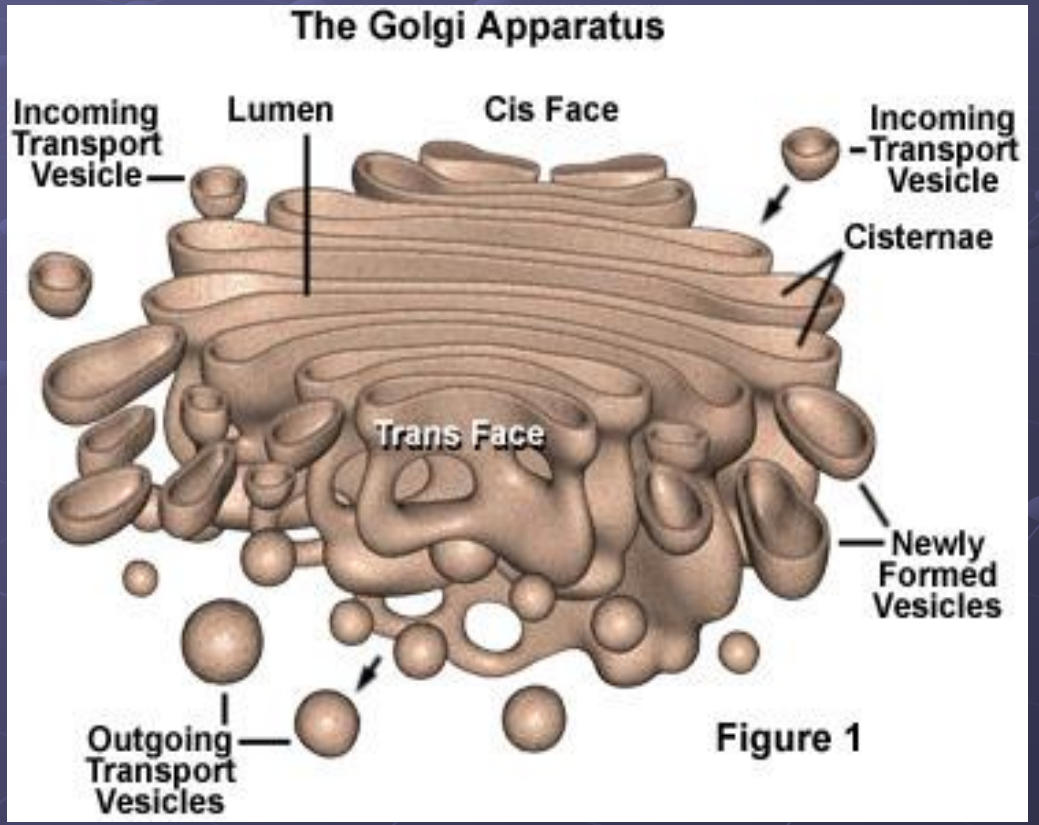
Endoplasmic Reticulum

- Transport system for materials in cell
- Two Types:
- Rough ER: covered with ribosomes; site of protein synthesis
- Smooth ER: NO ribosomes; it makes hormones & lipids



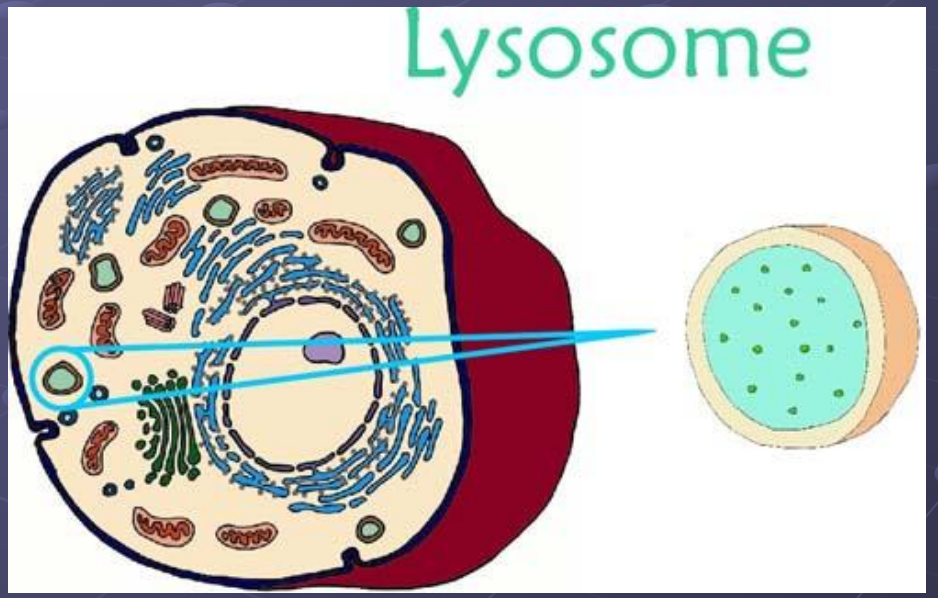
Golgi Apparatus

- **Delivery system** of the cell
- **Collects, modifies, and packages molecules** in the cell
- **Distributes and transports molecules in vesicles**



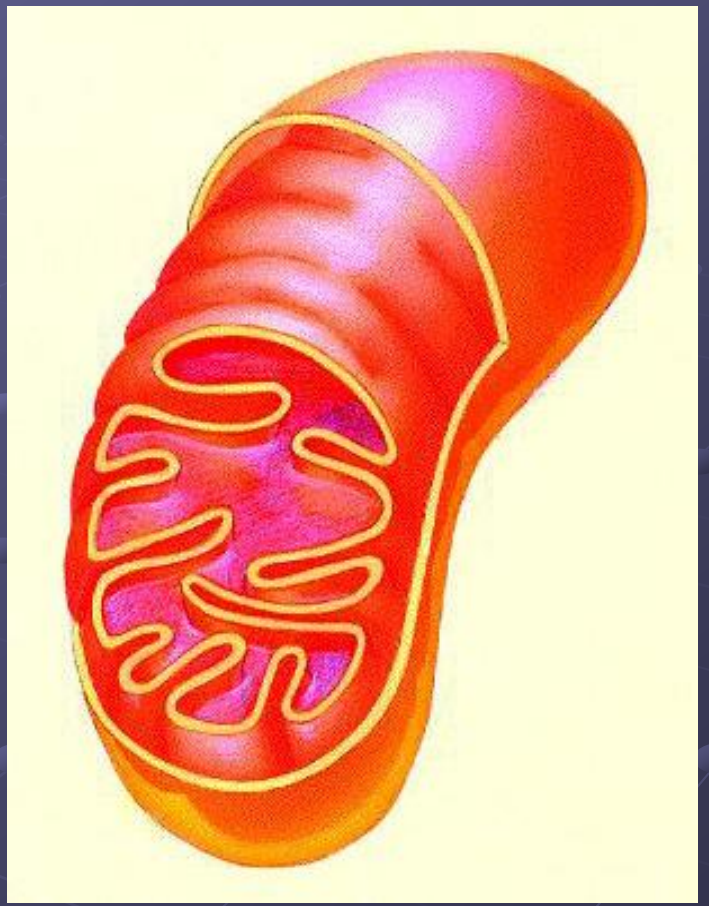
Lysosomes

- **Clean-up crew** of the cell
- Contain **digestive enzymes** that **break down macromolecules** for the cell to use
- **Removes waste particles**



Mitochondria

- "Powerhouse" of the cell
- Site of cellular respiration
- Converts energy stored in food into energy the cell needs – ATP

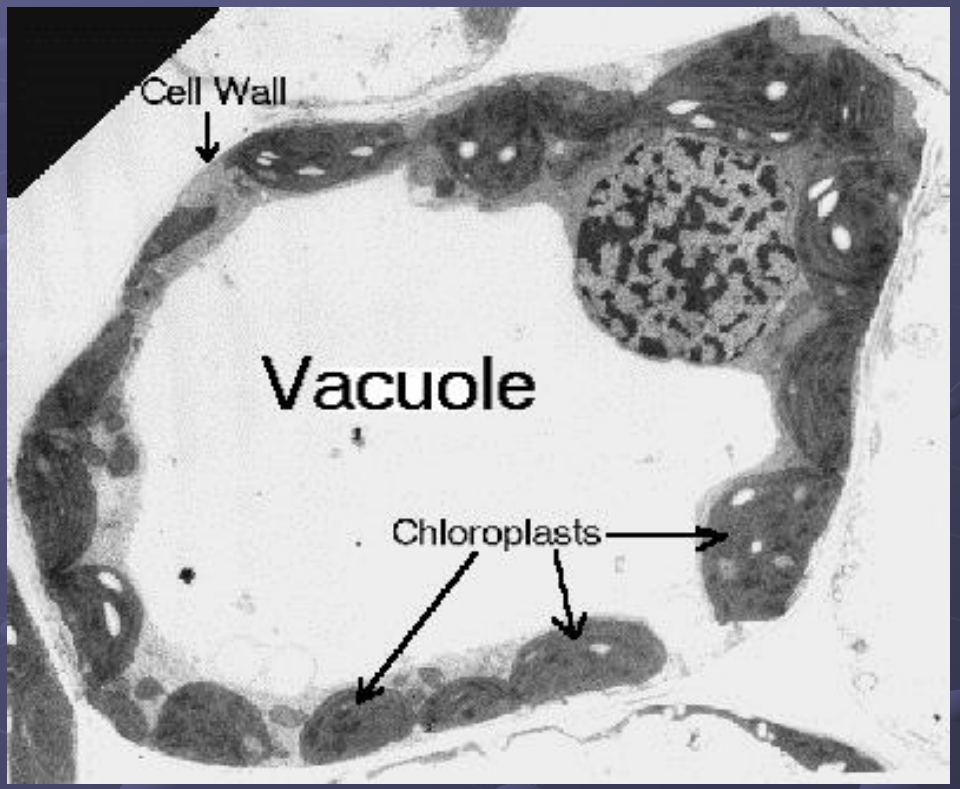


Sugar + Oxygen → Carbon dioxide + Water + ATP

ATP = Adenosine triphosphate

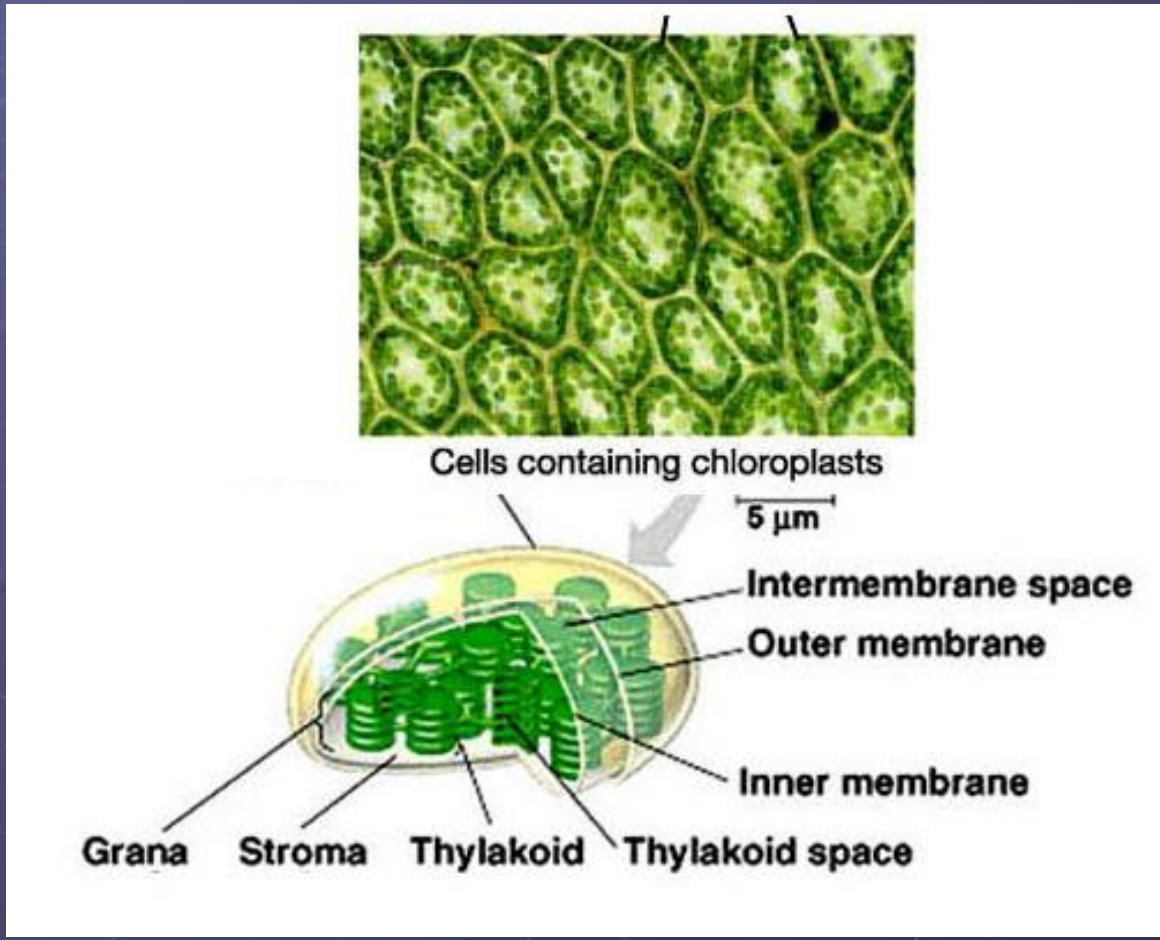
Vacuoles

- **Storage tank**
- **Holds water, food, enzymes, wastes, etc**
- **Large <u>CENTRAL</u> vacuole usually in plant cells**
  - **Supports cell shape in plants**
- **Many smaller vacuoles in animal cells**



Chloroplast

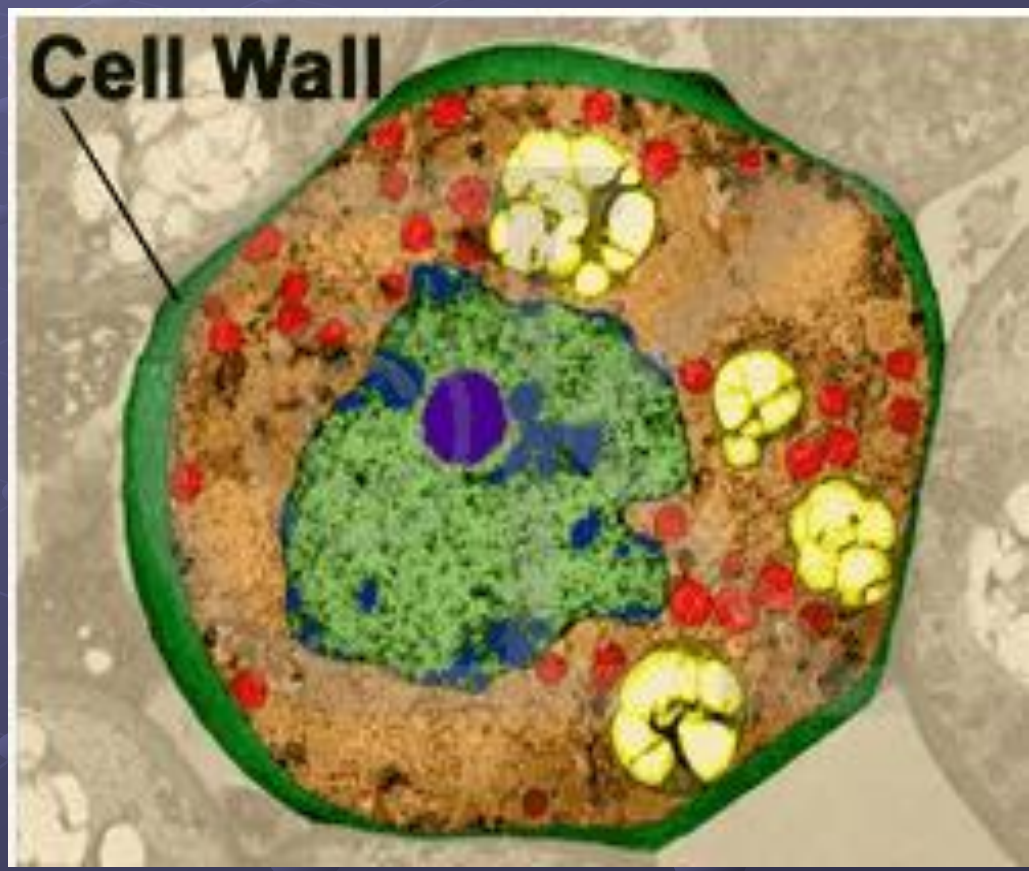
- Site of **photosynthesis**
- Changes **sunlight energy into chemical energy (glucose)**
- Contains green pigment, **chlorophyll**
- Found ONLY in **plant cells and algae**



Sunlight + Carbon Dioxide + Water → Sugar + Oxygen

Cell Wall

- Rigid, protective barrier (maintains cell shape)
- Found in PLANT and BACTERAL cells
- Located outside of the cell membrane
- Made of cellulose (Carbohydrate fiber)



Quick Review

- Which organelle is the control center of the cell?
  - Nucleus
- Which organelle holds the cell together?
  - Cell membrane
- Which organelles are not found in animal cells?
  - Cell wall, central vacuole, chloroplasts
- Which organelle helps plant cells make food?
  - Chloroplasts
- What does E.R. stand for?
  - Endoplasmic reticulum