

# Cells

## Types and Organelles

## Cell Theory

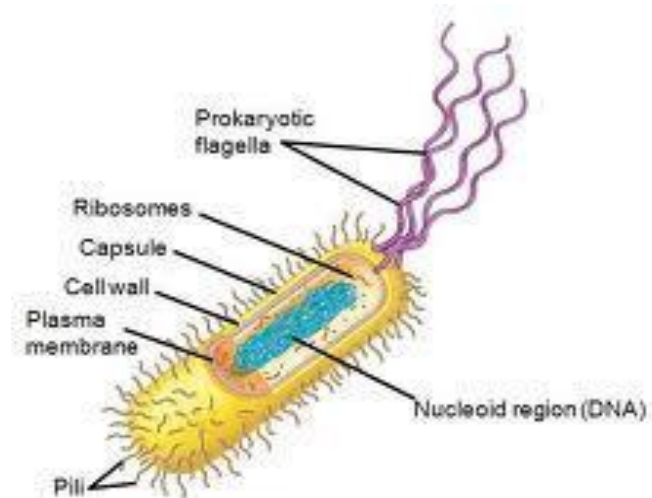
1. All living things are made of one or more cells.
2. Cells come from pre-existing cells.
3. Cells are the basic unit of life.

# Types of Cells

- All living things are made up of cells. Cells can be very simple or very complex and come in two basic types – prokaryotic and eukaryotic.

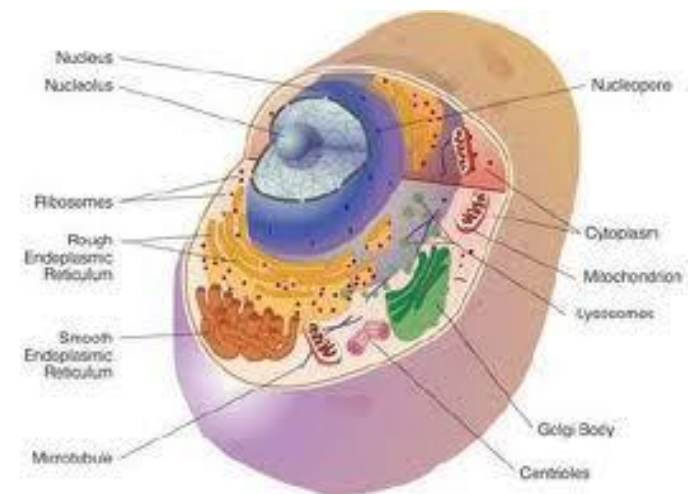
# Prokaryotic Cells

- Contain no nucleus or membrane-bound organelles
- They are small and simple cells. They are found in the simplest life forms called prokaryotes.
- Examples: archea and bacteria



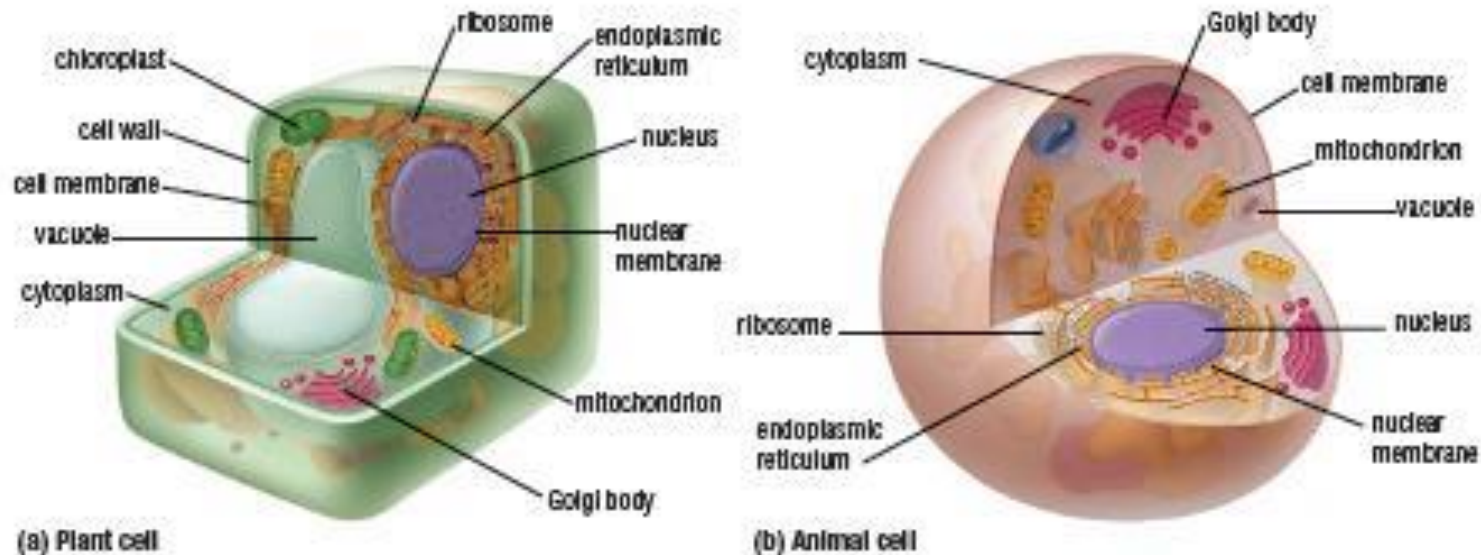
# Eukaryotic Cells

- Contain a nucleus and membrane-bound organelles.
- They are large and complex. They are found in the most complex life forms called eukaryotes.
- Examples: plant, animal, fungi and protist

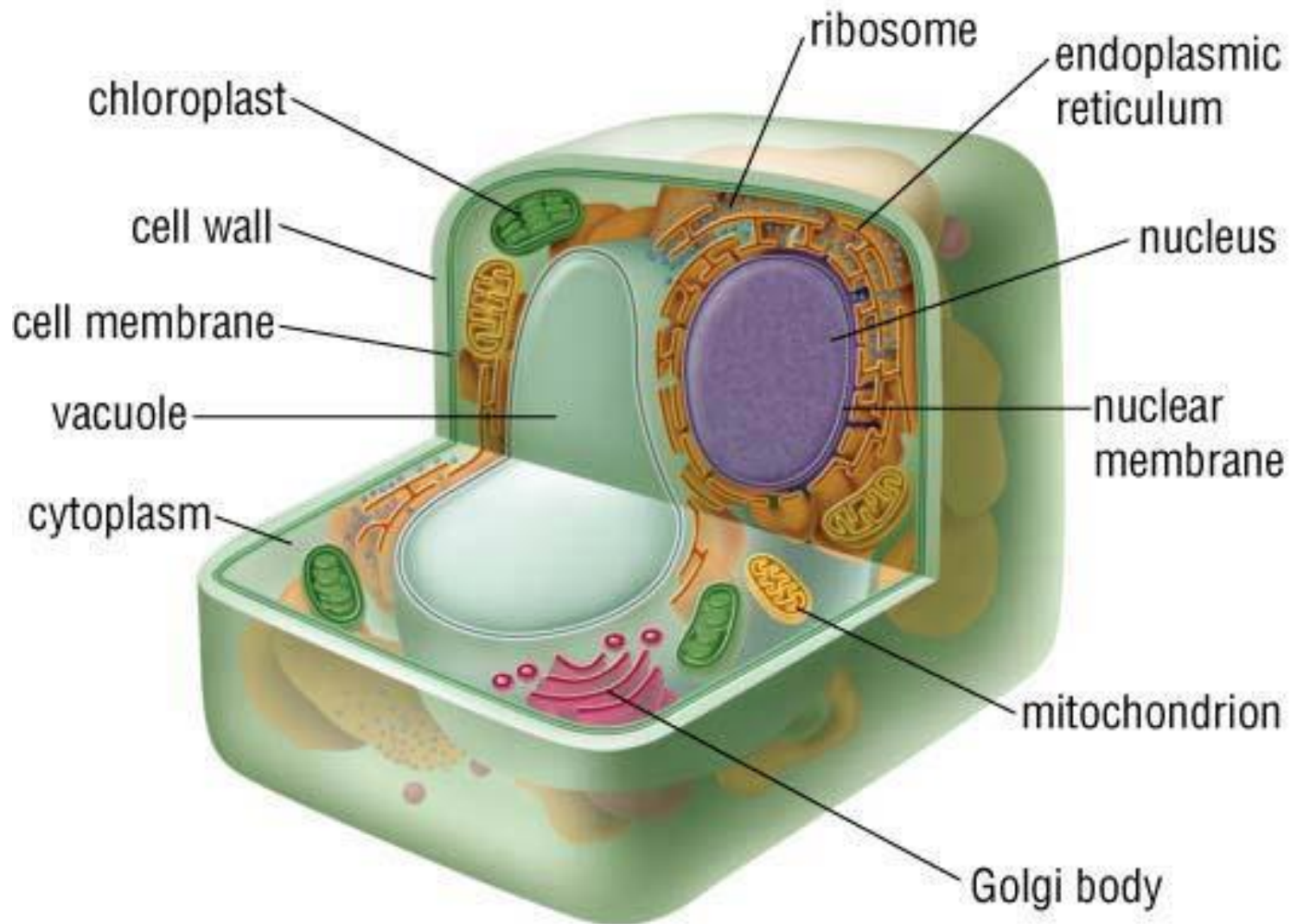


# Animal and Plant Cells

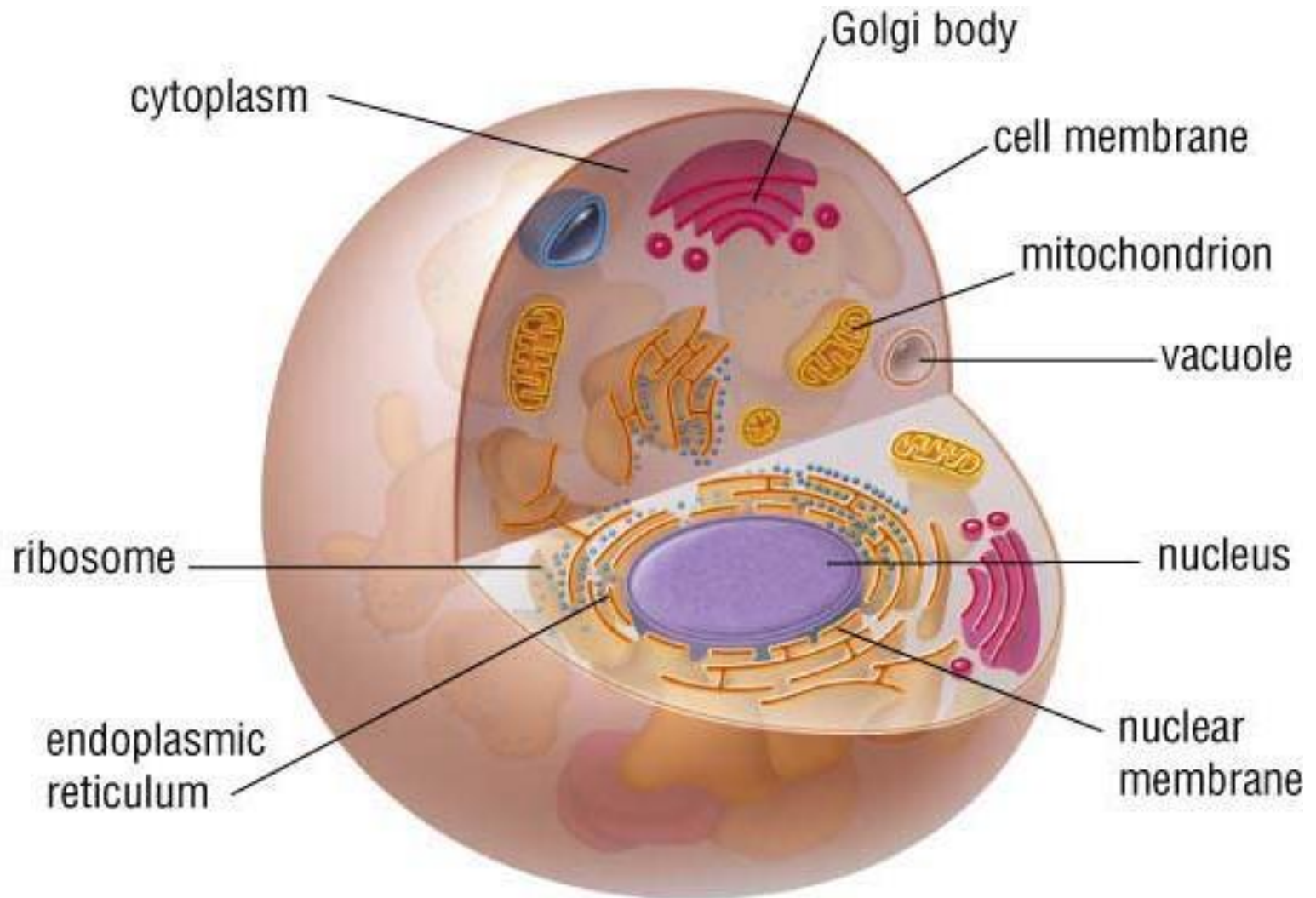
- Plant and animal cells have many structures in common. However, plant cells have some organelles that animal cells do not.

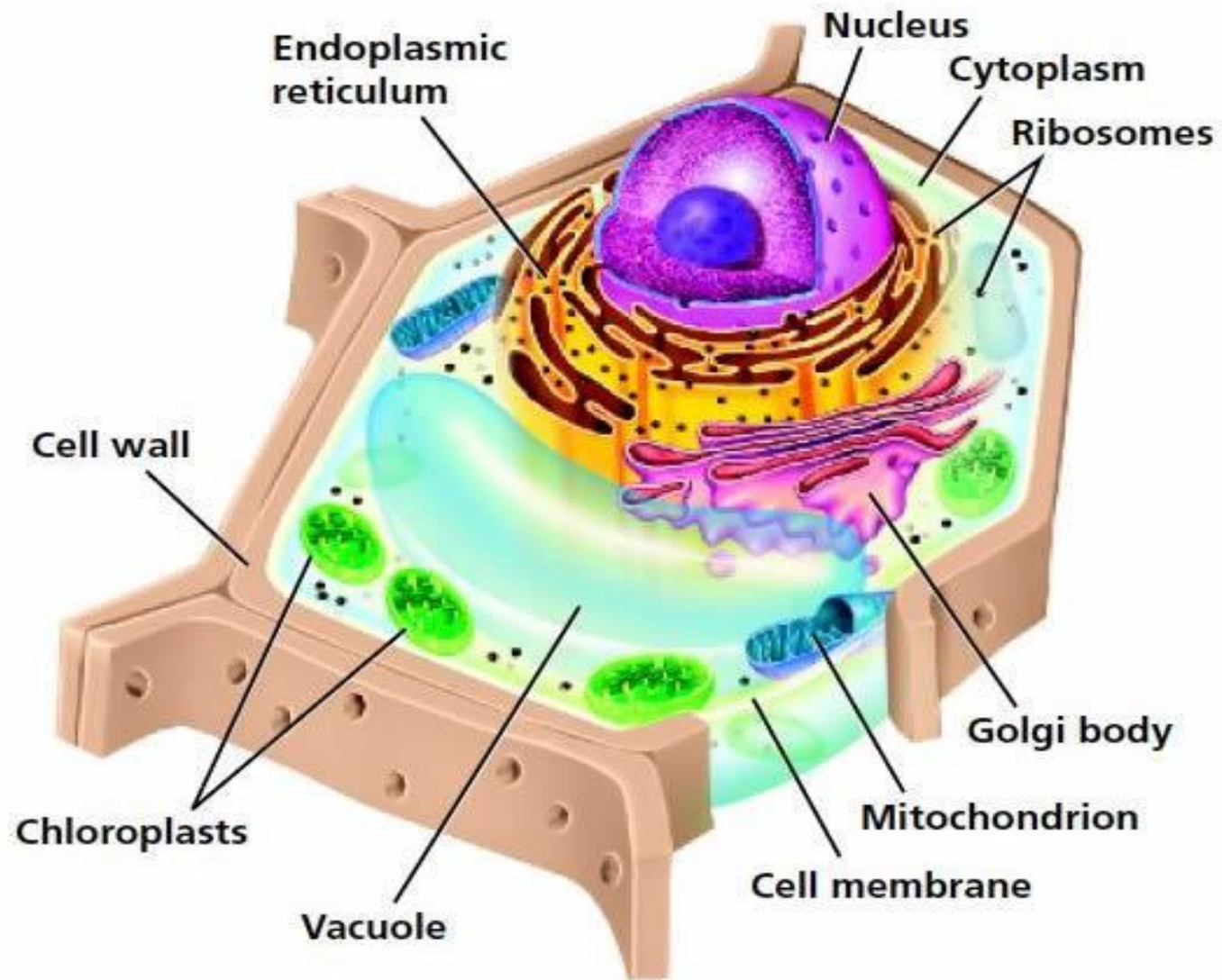


# Plant Cell

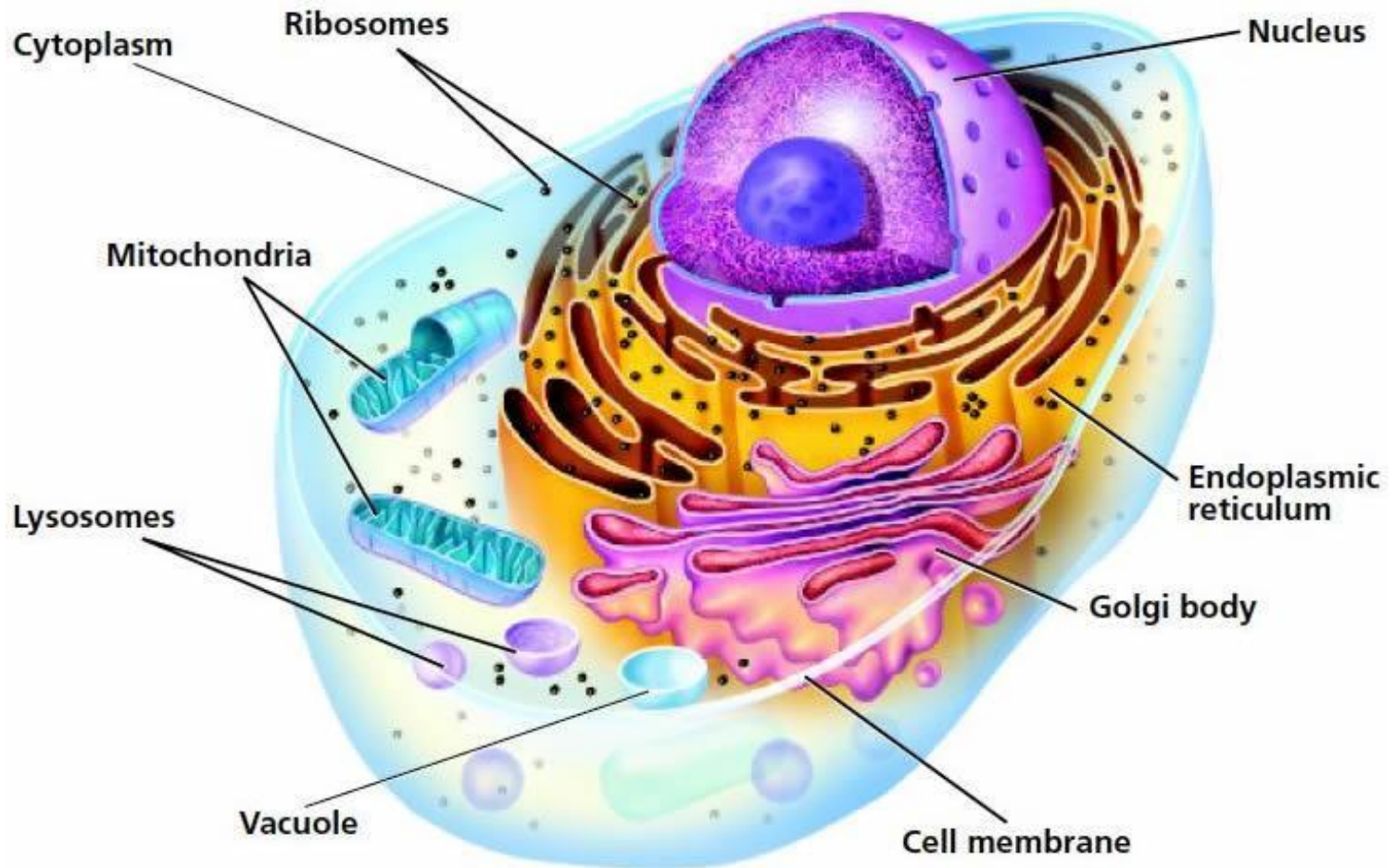


# Animal Cell



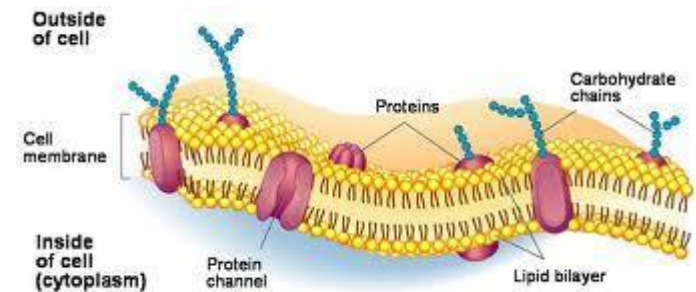
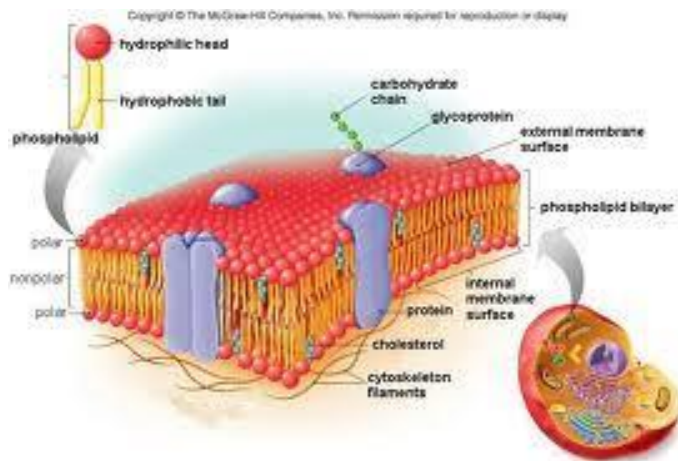
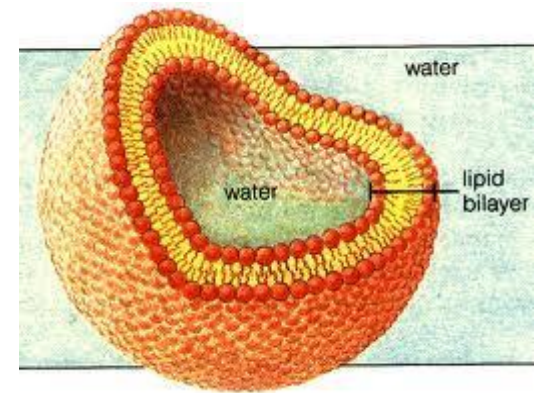






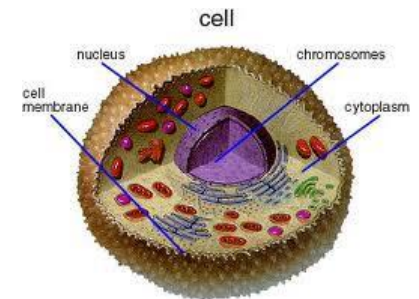
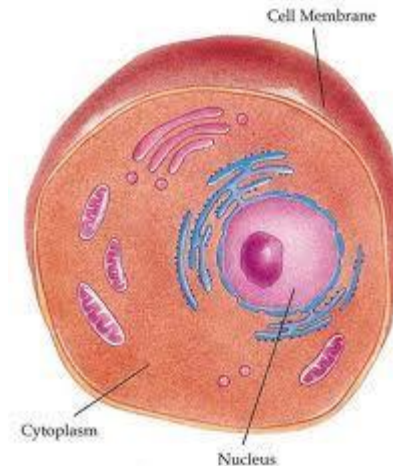
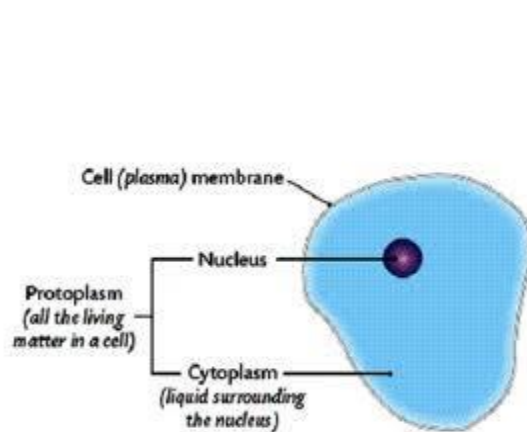
# Cell Membrane

- **Location:** Outermost boundary of the cell
- **Structure:** Phospholipid bilayer
- **Function:** It keeps the cell together and controls what enters and what leaves the cell



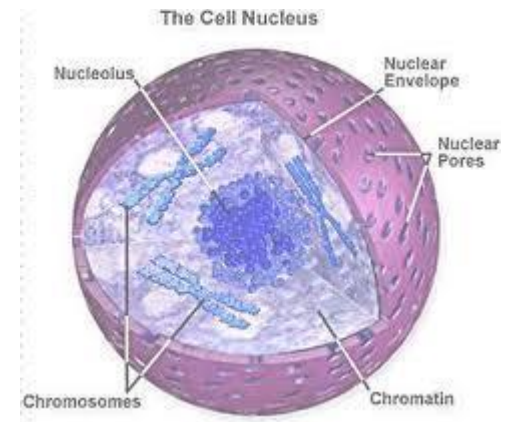
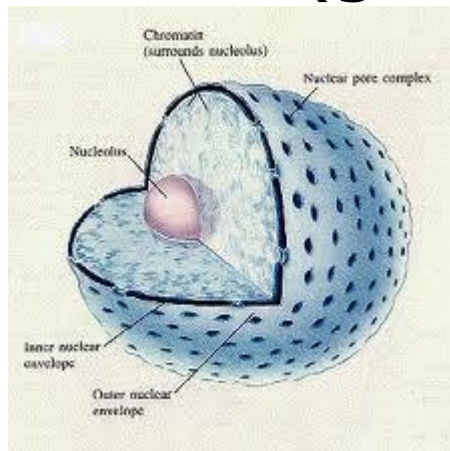
# Cytoplasm

- **Location:** Fills the cell
- **Structure:** clear jelly-like fluid
- **Function:** holds and cushions organelles and contains dissolved substances



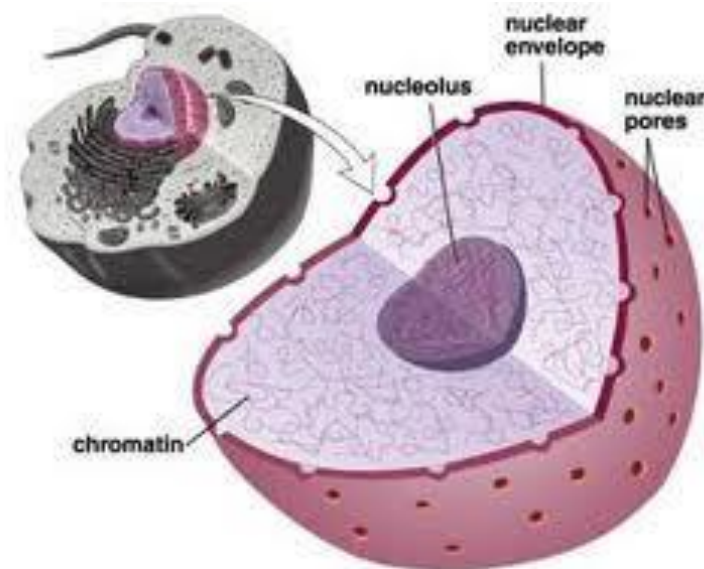
# Nucleus

- **Location:** roughly in the centre of the cell
- **Structure:** dark sphere surrounded by a nuclear envelope
- **Function:** control centre of the cell; contains DNA (genetic material)



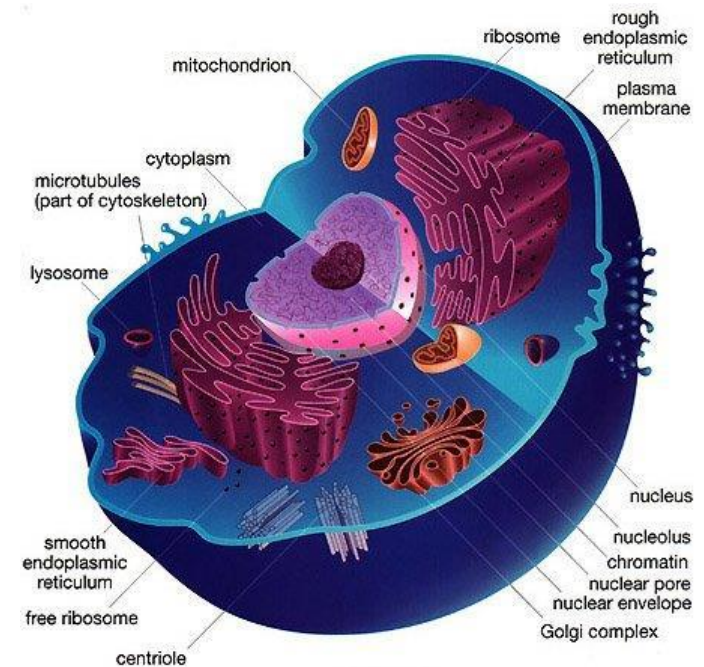
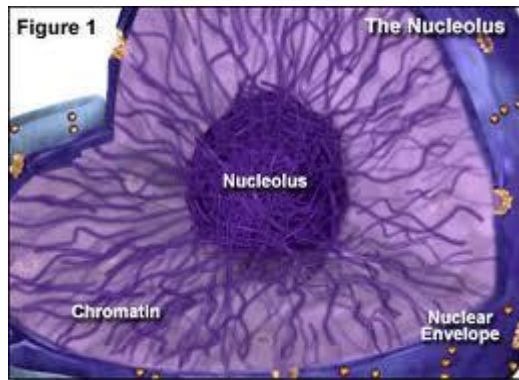
# Nuclear Membrane/envelope

- **Location:** surrounds the nucleus
- **Structure:** lipid-protein bilayer that contains pores
- **Function:** contains the contents of the nucleus and controls what enters and exits the nucleus



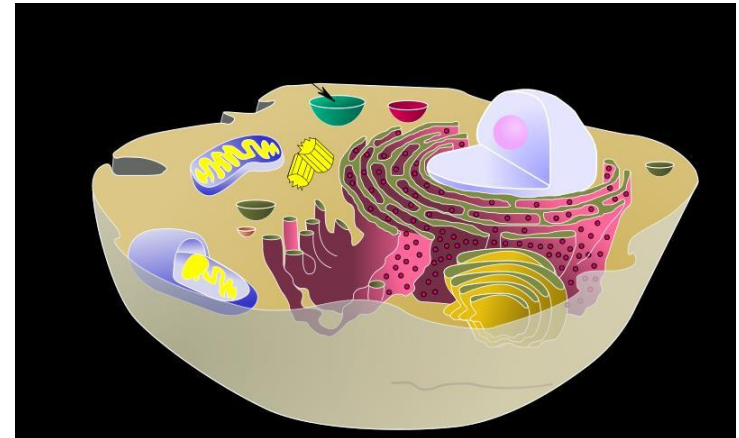
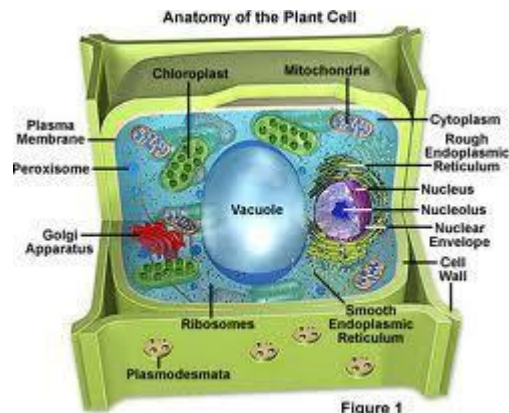
# Nucleolus

- **Location:** inside the nucleus
- **Structure:** dense, round mass
- **Function:** site where ribosomes are made and RNA is stored



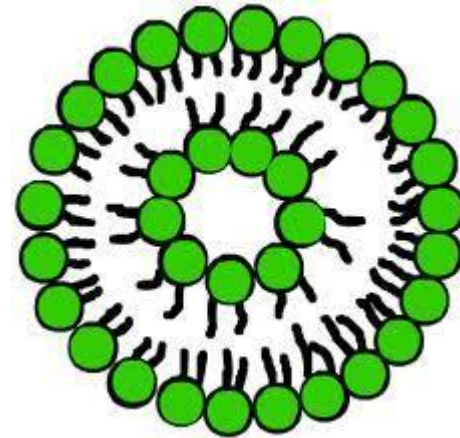
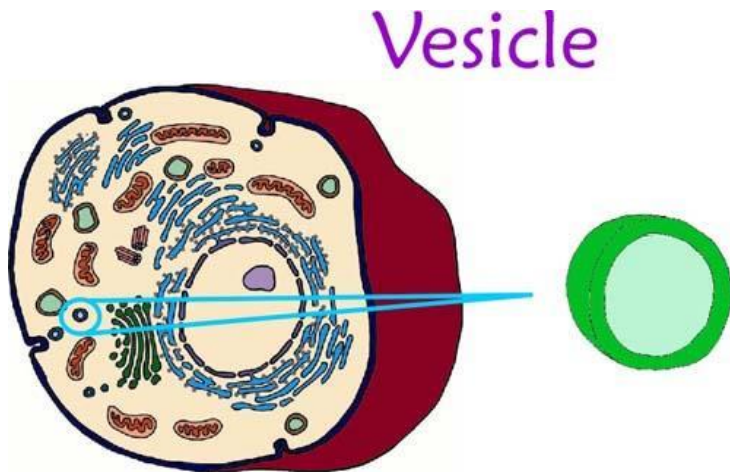
# Vacuoles

- **Location:** in cytoplasm
- **Structure:** fluid filled sacs; more prominent in plant cells
- **Function:** storage unit (nutrients, water and other substances used by the cell); plants – mainly storage of water (maintains pressure of cell)



# Vesicles

- **Location:** in cytoplasm
- **Structure:** membrane-bound organelles
- **Function:** transports substances throughout cell





# Mitochondria

- **Location:** in cytoplasm
- **Structure:** cylindrical structure
- **Function:** 'powerhouse' of the cell – provides energy to the cell for its activities

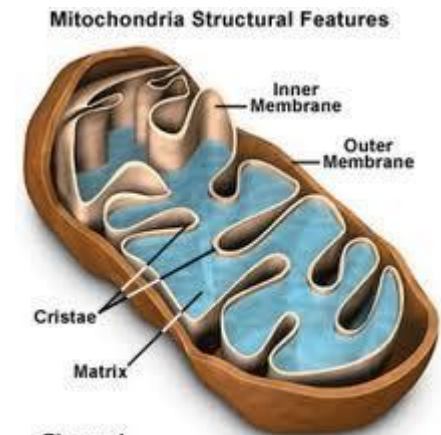
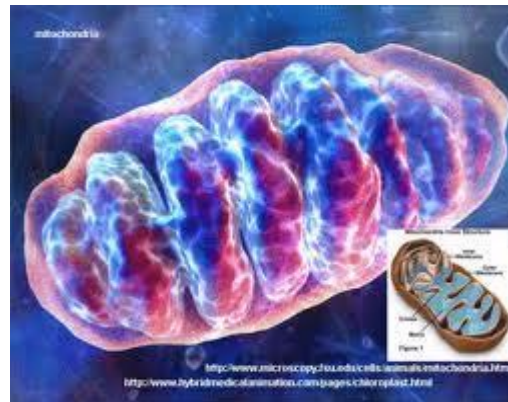
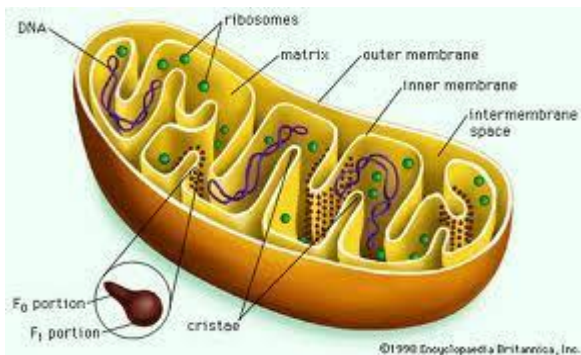
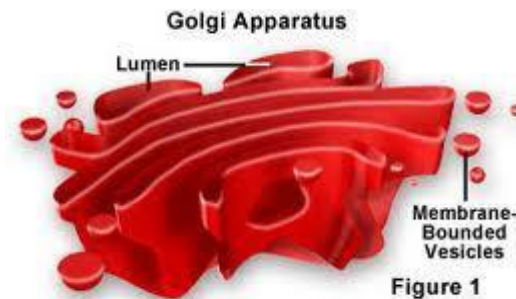
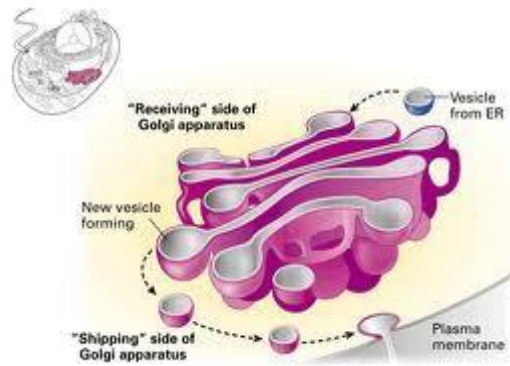


Figure 1

# Golgi Apparatus

- **Location:** close to the nucleus; in cytoplasm
- **Structure:** flattened bag-like membrane-bound sacs
- **Function:** sorts and packages proteins and other substances for transport out of the cell



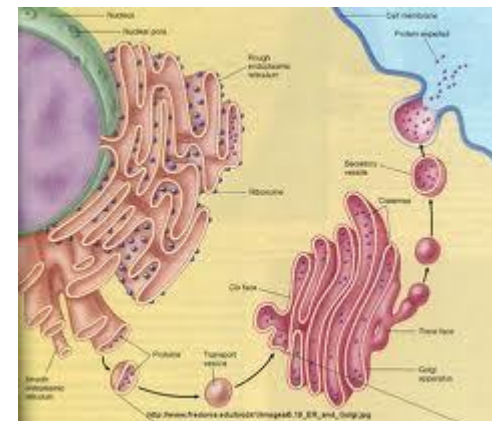
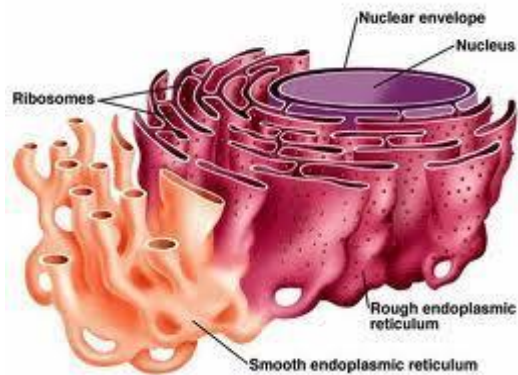
# lysosomes

- **Location:** in cytoplasm; only in animal cells
- **Structure:** spherical organelles
- **Function:** 'suicide bags;' digests food particles, destroys harmful materials that enter the cell and breaks down cell when it gets old and starts to malfunction



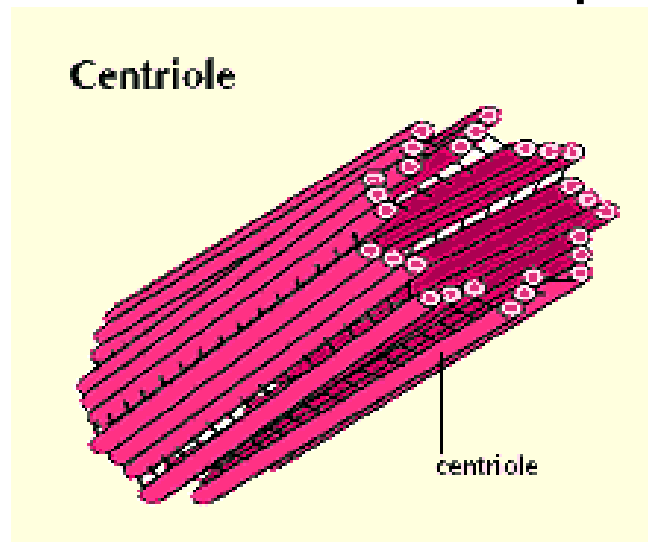
# Endoplasmic Reticulum

- **Location:** runs through the cytoplasm
- **Structure:** system of tubes and channels
  - ∞ With ribosomes – Rough
  - ∞ Without ribosomes – Smooth
- **Function:** transports materials made in the cell and connects the nucleus to the cell membrane



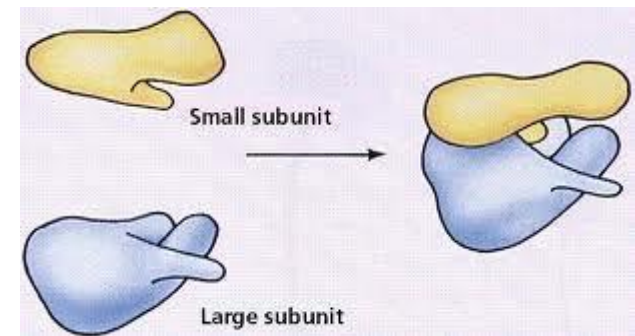
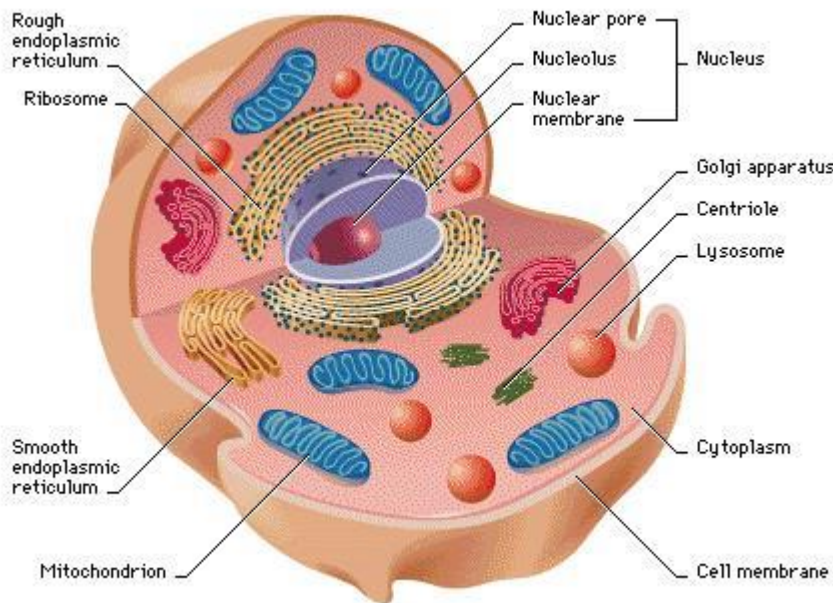
# centrioles

- **Location:** only in animal cells; in cytoplasm
- **Structure:** small, cylinders (barrel-like)
- **Function:** involved in cell division; provides attachment for spindle fibres



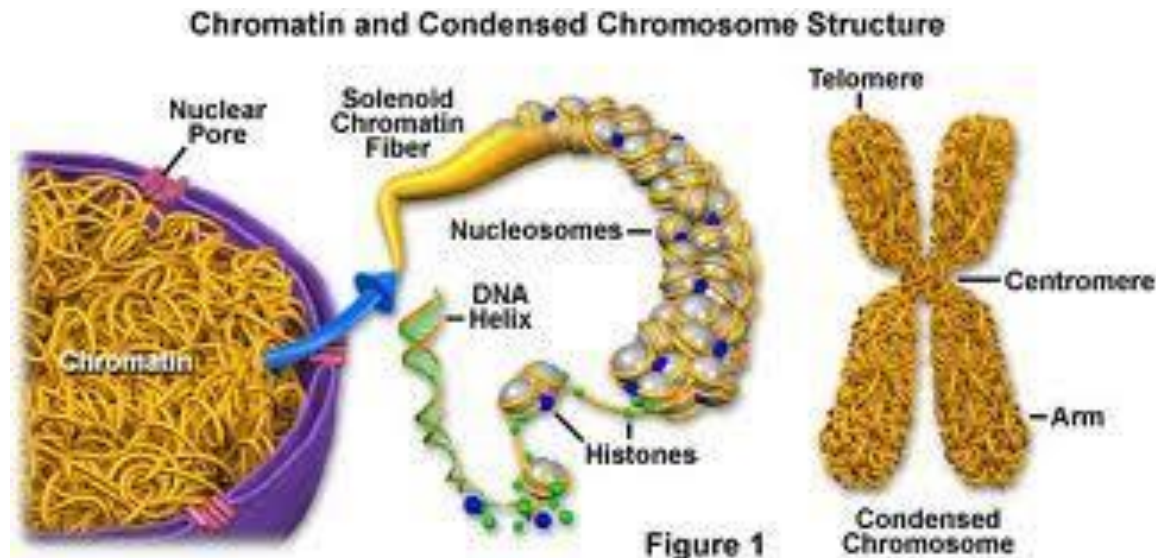
# Ribosomes

- **Location:** attached to ER or free-floating in cytoplasm
- **Structure:** small, dark spheres
- **Function:** site of protein synthesis



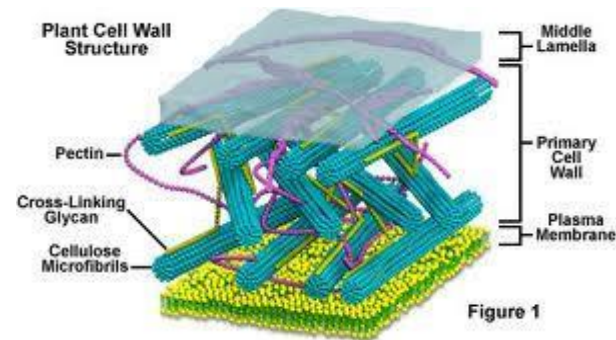
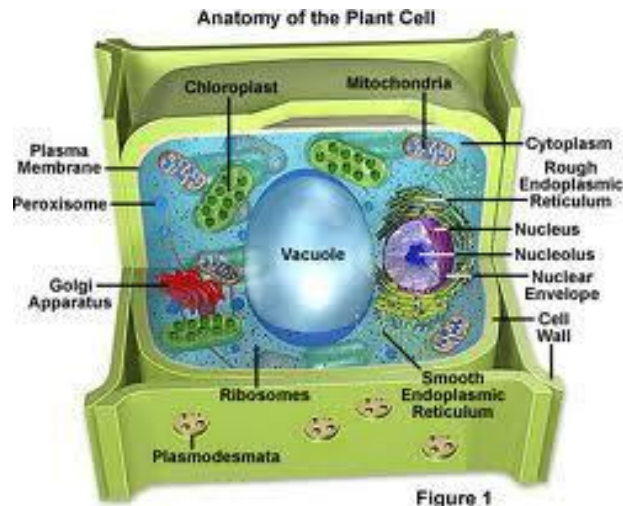
# chromatin

- **Location:** inside the nucleus
- **Structure:** strands of DNA and proteins
- **Function:** reproduction and inheritance of traits



# Cell Wall

- **Location:** surrounds the cell membrane of plant cells ONLY
- **Structure:** tough, rigid structure made of cellulose
- **Function:** provides structural support for the cell





# Chloroplasts

- **Location:** in cytoplasm of plant cells ONLY
- **Structure:** tiny sacs called thylakoid
- **Function:** contains green pigment called chlorophyll (uses sun's energy for photosynthesis)

