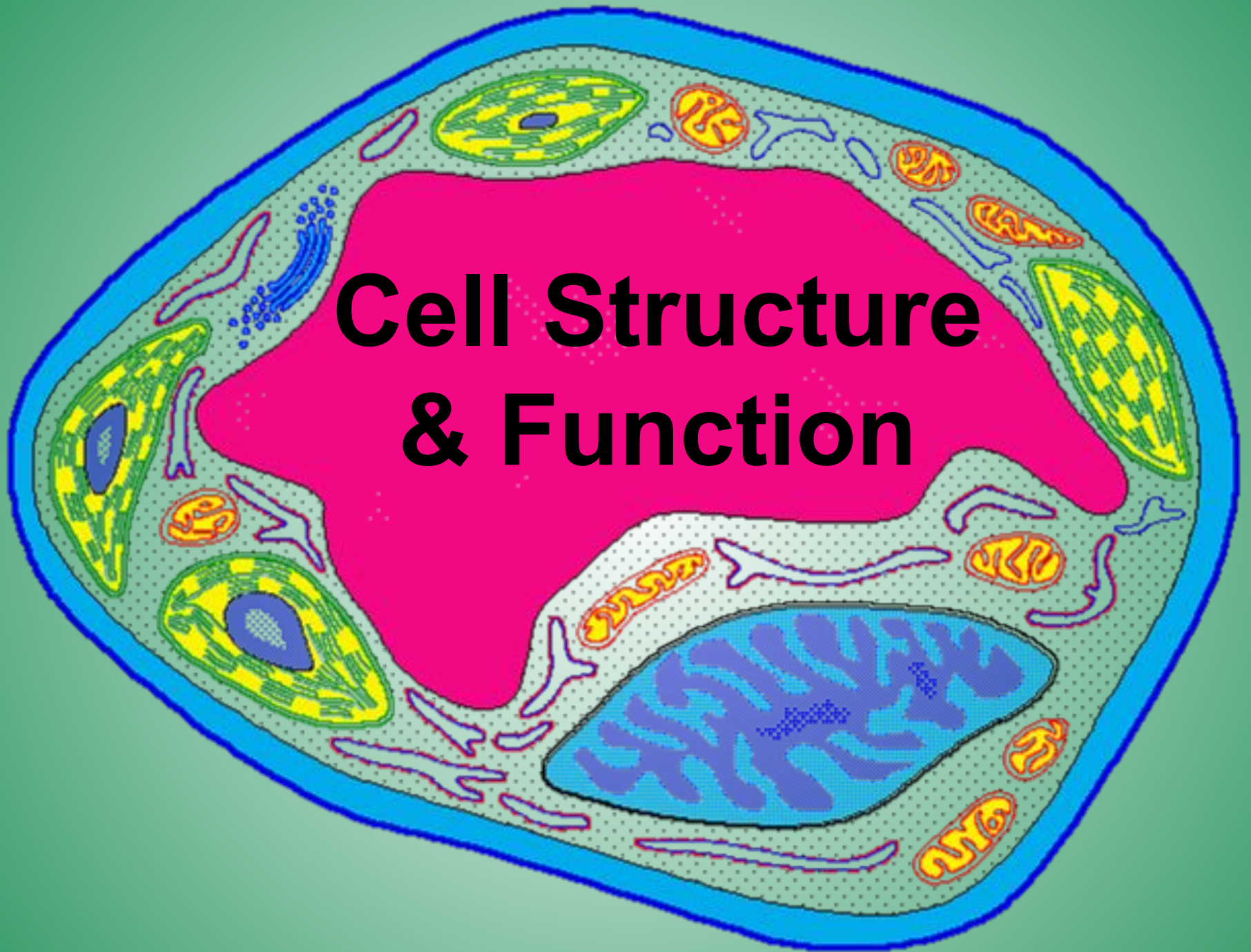


# Cell Structure & Function



# Cell Theory

- All living things are made up of cells.
- Cells are the smallest working units of all living things.
- All cells come from preexisting cells through cell division.

# Definition of Cell

A cell is the smallest unit that is capable of performing life functions.



# Examples of Cells



Amoeba Proteus



Plant Stem

Bacteria



Red Blood Cell



Nerve Cell



# Two Types of Cells

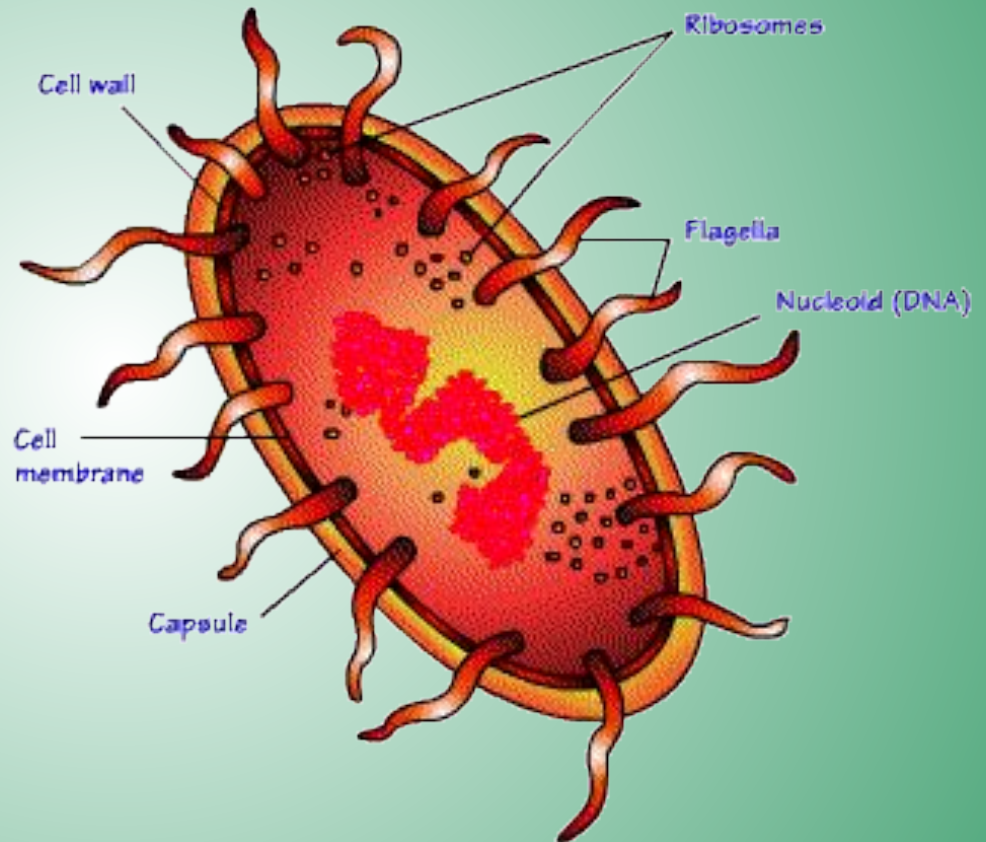
## Жасушаның екі түрі

- Prokaryotic
- Eukaryotic

Прокариоттар  
Эукариоттар

# Prokaryotic

- Do not have structures surrounded by membranes
- Few internal structures
- One-celled organisms, Bacteria

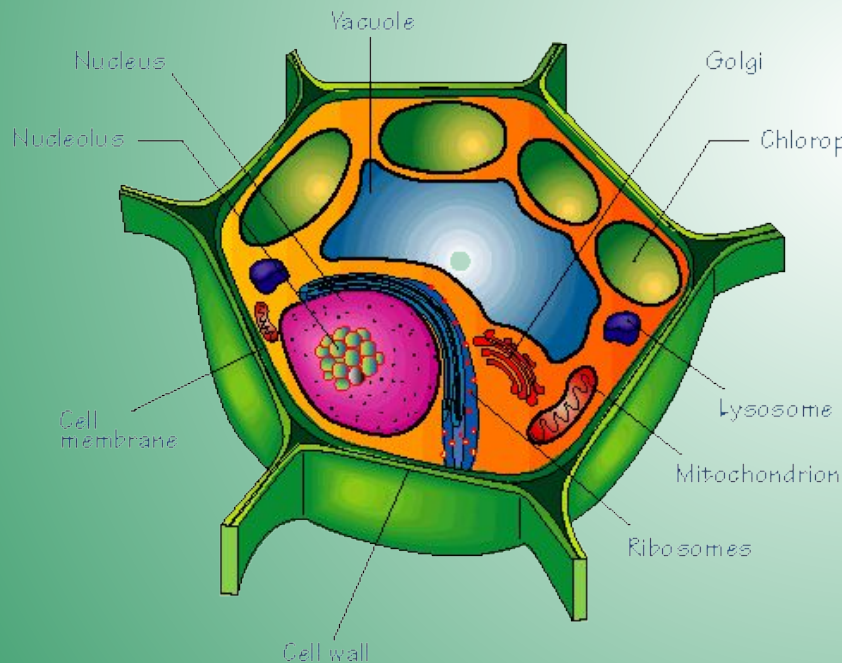




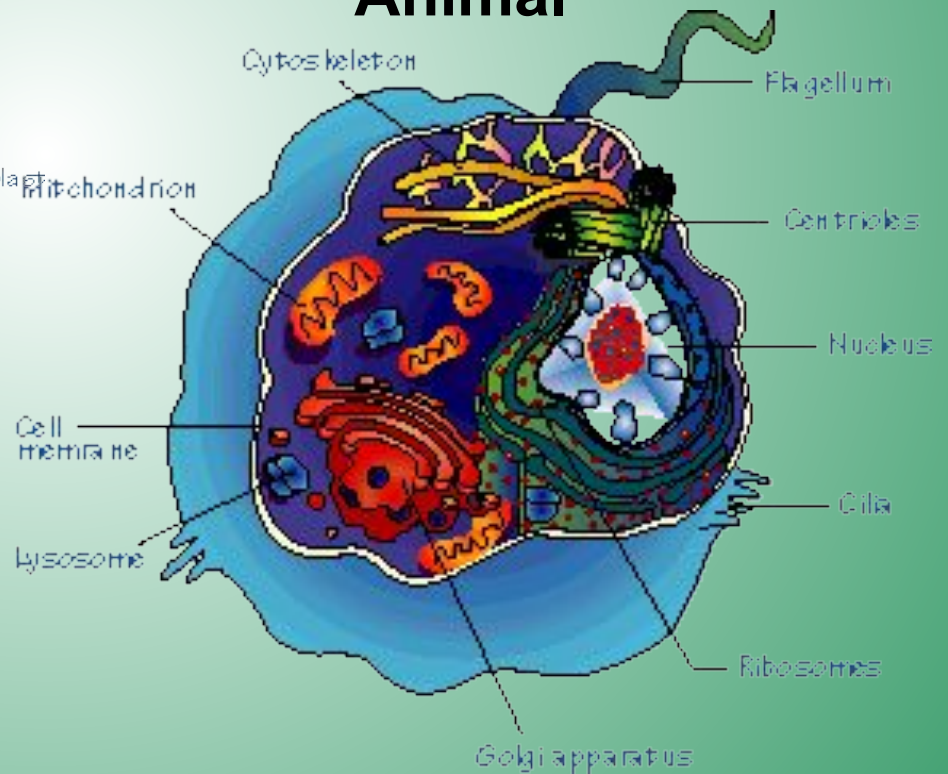
# Eukaryotic

- Contain organelles surrounded by membranes
- Most living organisms

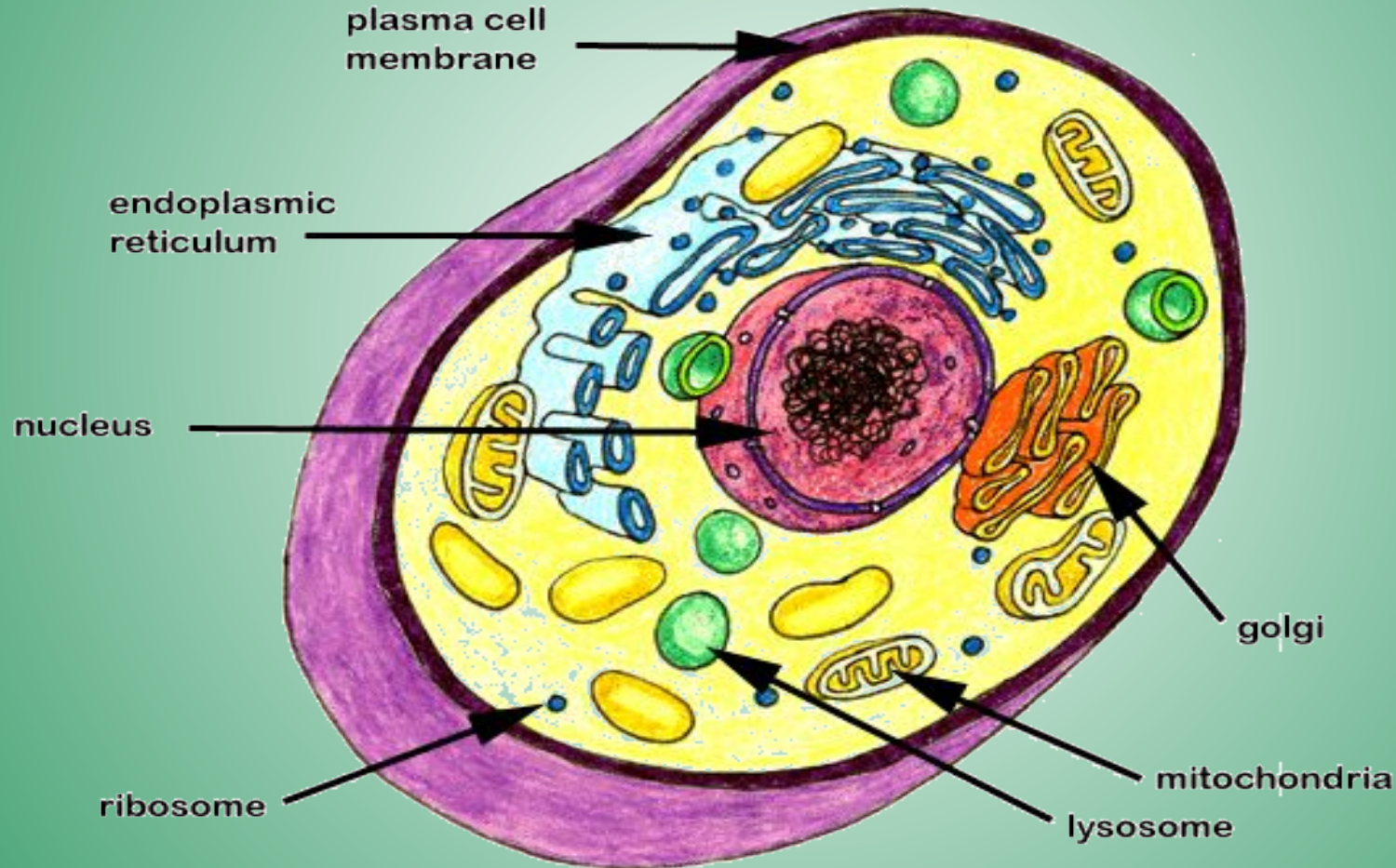
## Plant



## Animal

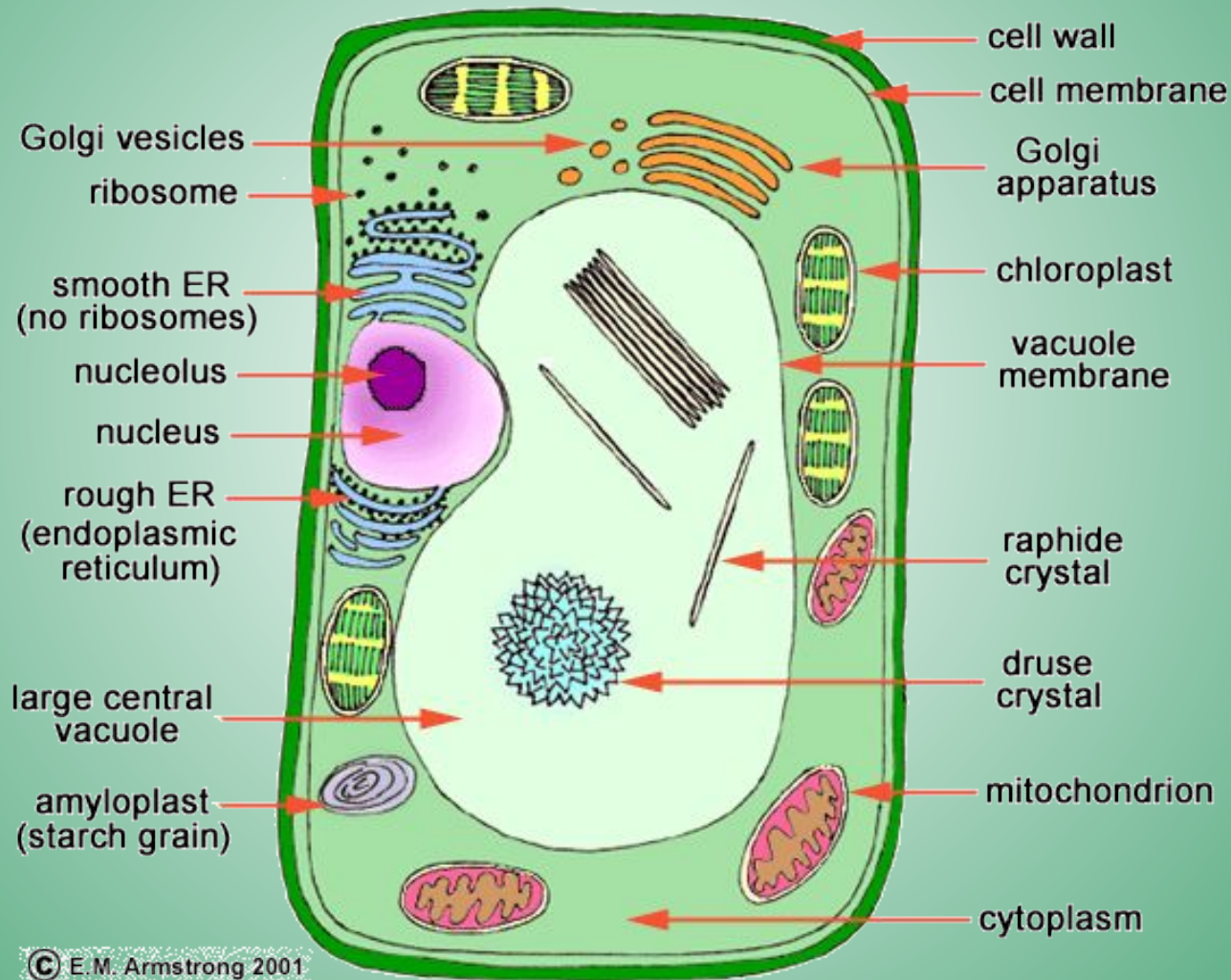


# “Typical” Animal Cell





# “Typical” Plant Cell



# Cell Parts

## Organelles

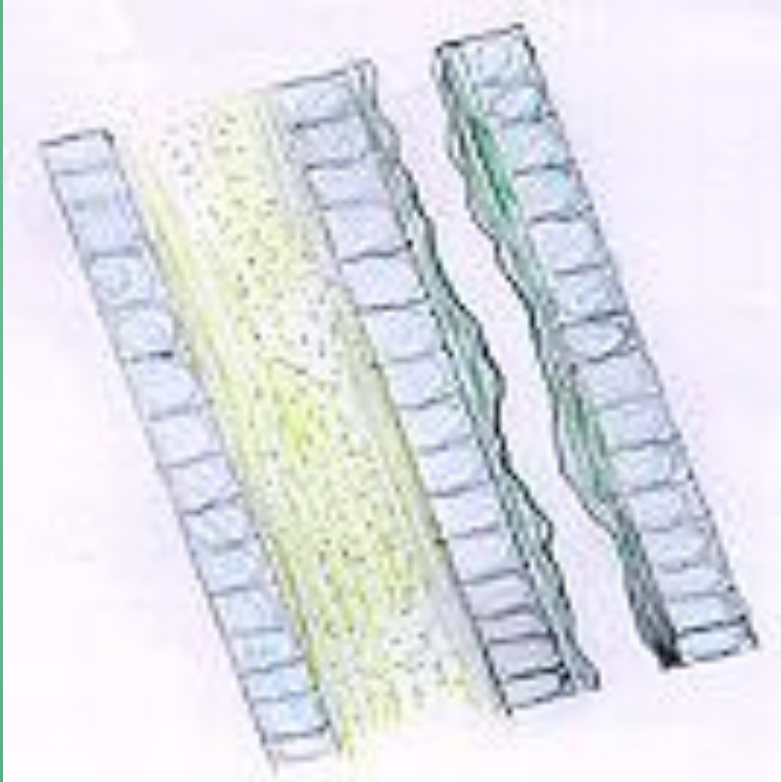
# Cell Membrane



- Outer membrane of cell that controls movement in and out of the cell
- Double layer



# Cell Wall



- Most commonly found in plant cells & bacteria
- Supports & protects cells

# **Inside the Cell**

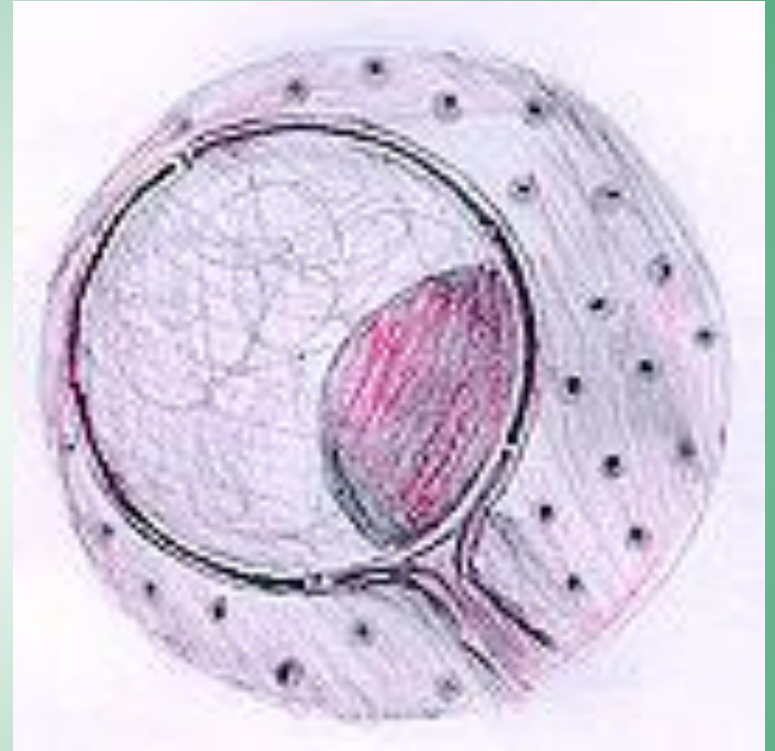
# Nucleus

- Directs cell activities
- Separated from cytoplasm by nuclear membrane
- Contains genetic material - DNA

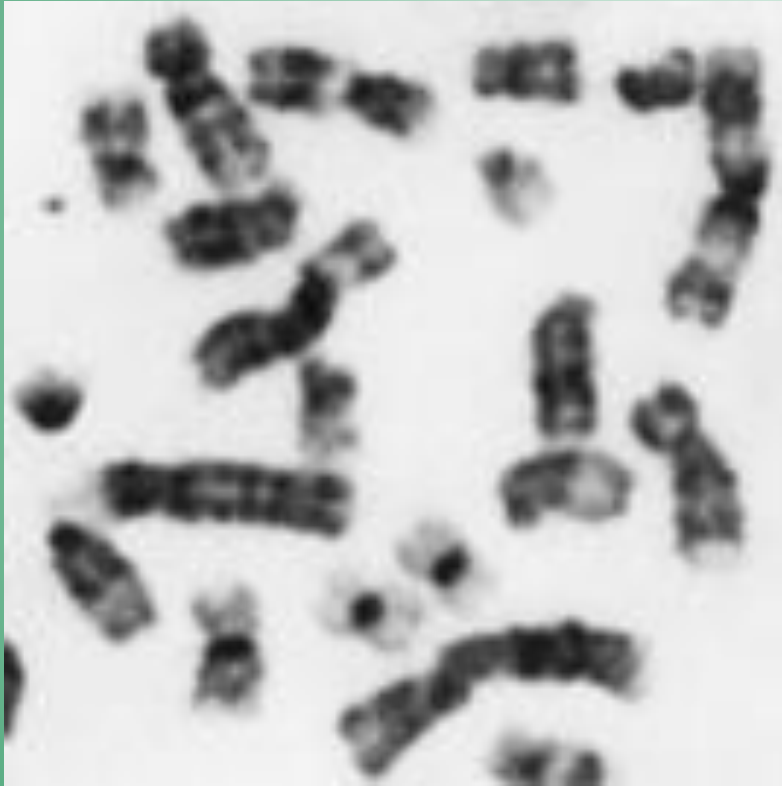


# Nuclear Membrane

- Surrounds nucleus
- Made of two layers
- Openings allow material to enter and leave nucleus



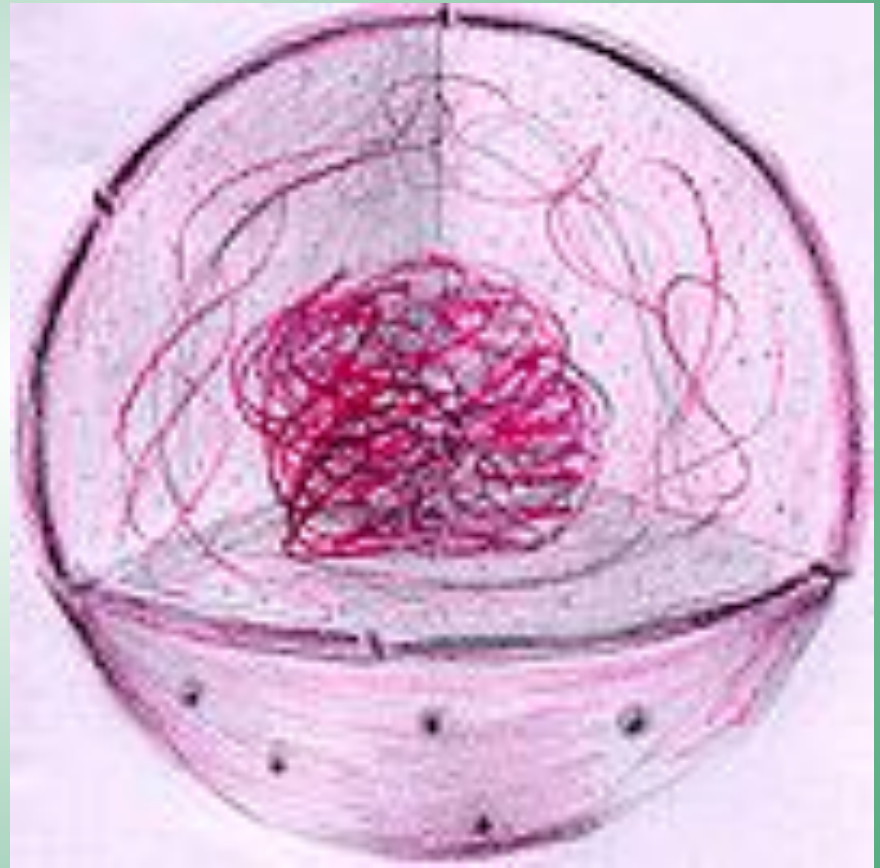
# Chromosomes



- In nucleus
- Made of DNA
- Contain instructions for traits & characteristics

# Nucleolus

- Inside nucleus
- Contains RNA to build proteins





# Cytoplasm

- Gel-like mixture
- Surrounded by cell membrane
- Contains hereditary material

# Endoplasmic Reticulum



- Moves materials around in cell
- Smooth type: lacks ribosomes
- Rough type (pictured): ribosomes embedded in surface

# Ribosomes

- Each cell contains thousands
- Make proteins
- Found on ribosomes & floating throughout the cell





# Mitochondria

- Produces energy through chemical reactions – breaking down fats & carbohydrates
- Controls level of water and other materials in cell
- Recycles and decomposes proteins, fats, and carbohydrates



# Golgi Bodies

- Move materials within the cell
- Move materials out of the cell



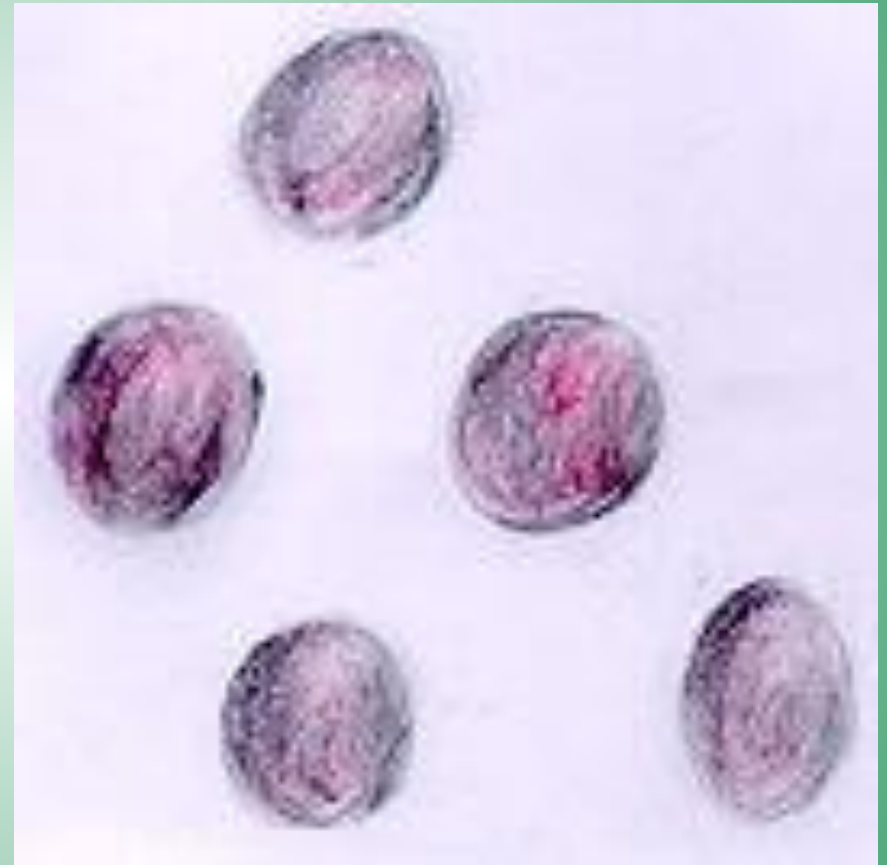
# Lysosome

- Digestive 'plant' for proteins, fats, and carbohydrates
- Transports undigested material to cell membrane for removal
- Cell breaks down if lysosome explodes



# Vacuoles

- Membrane-bound sacs for storage, digestion, and waste removal
- Contains water solution
- Help plants maintain shape





# Chloroplast

- Usually found in plant cells
- Contains green chlorophyll
- Where photosynthesis takes place

