

# Human cell

Md. Noor Raman(Asst, prof. NENC)

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# INTRODUCTION

Diameter  $2120\mu\text{m}$ .

Human body has 100 trillion of cell

Modern Cell theory-

- Cells make up all living matter.
- All cells arise from other cells.
- Chemical reactions of cell, anabolism and catabolism take place inside the cell.

The cell is the fundamental unit of living organisms. Hooke reported the discovery of cells in plants in 1665 (Hooke, 1665)

- Between 1838 and 1855, Schleiden, Schwann, Remak, Virchow and others stating that all organisms are composed of one or more cells that cells are the basic unit of structure and function in life and that all cells are derived from pre-existing cells (Mazzarello, 1999).
- Some organisms consist of a unicellular organism, others are multicellular

# Definition of cell

Cell may be defined as a structural and functional microscopic unit of the human body.

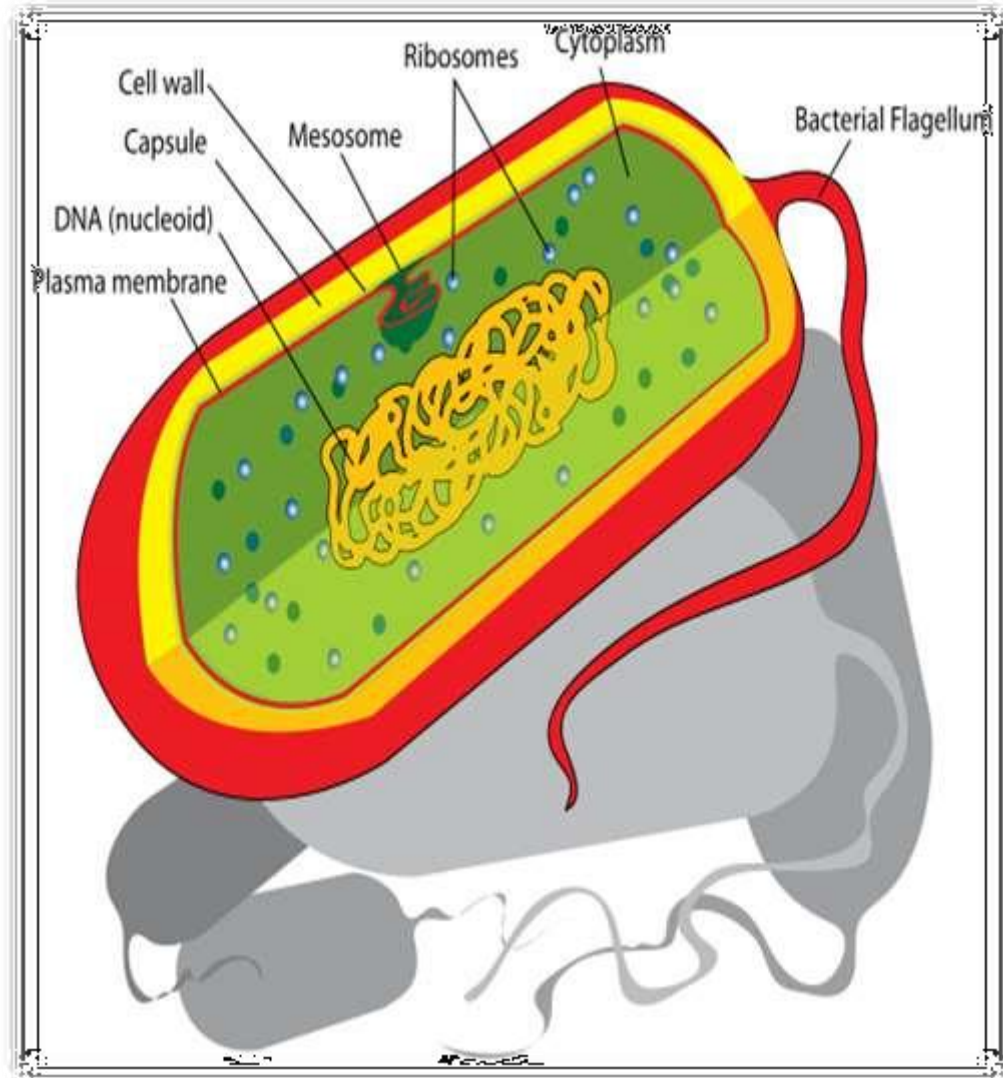
# Classification

Structural :

- prokaryotic cell
- Eukaryotic cell

# Prokaryotic cells

Lacks a  
membrane  
bound nucleus  
Circular DNA , no  
histones Few internal  
structures Has a cell  
membrane  
(cell wall)  
Has ribosomes

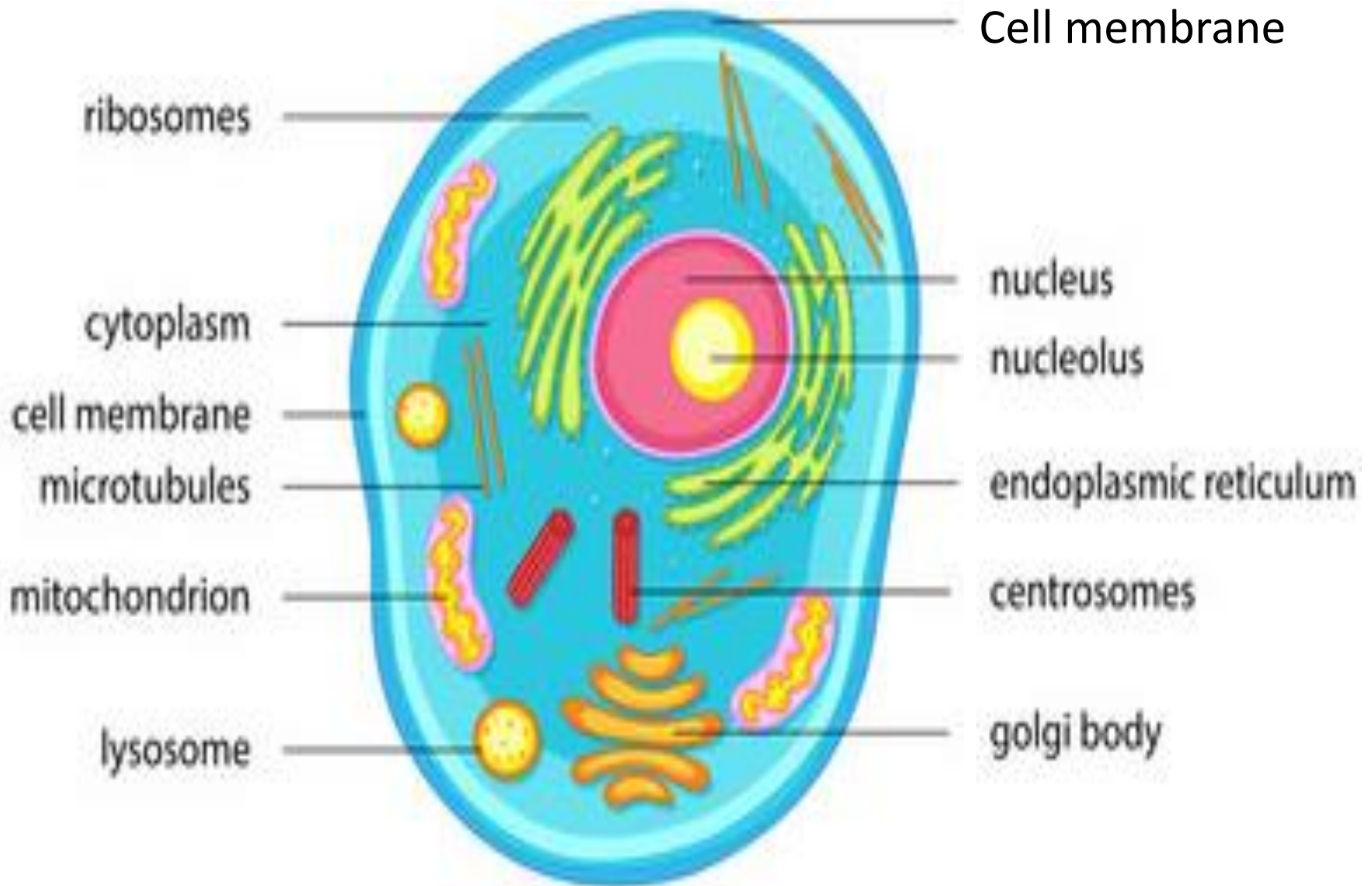


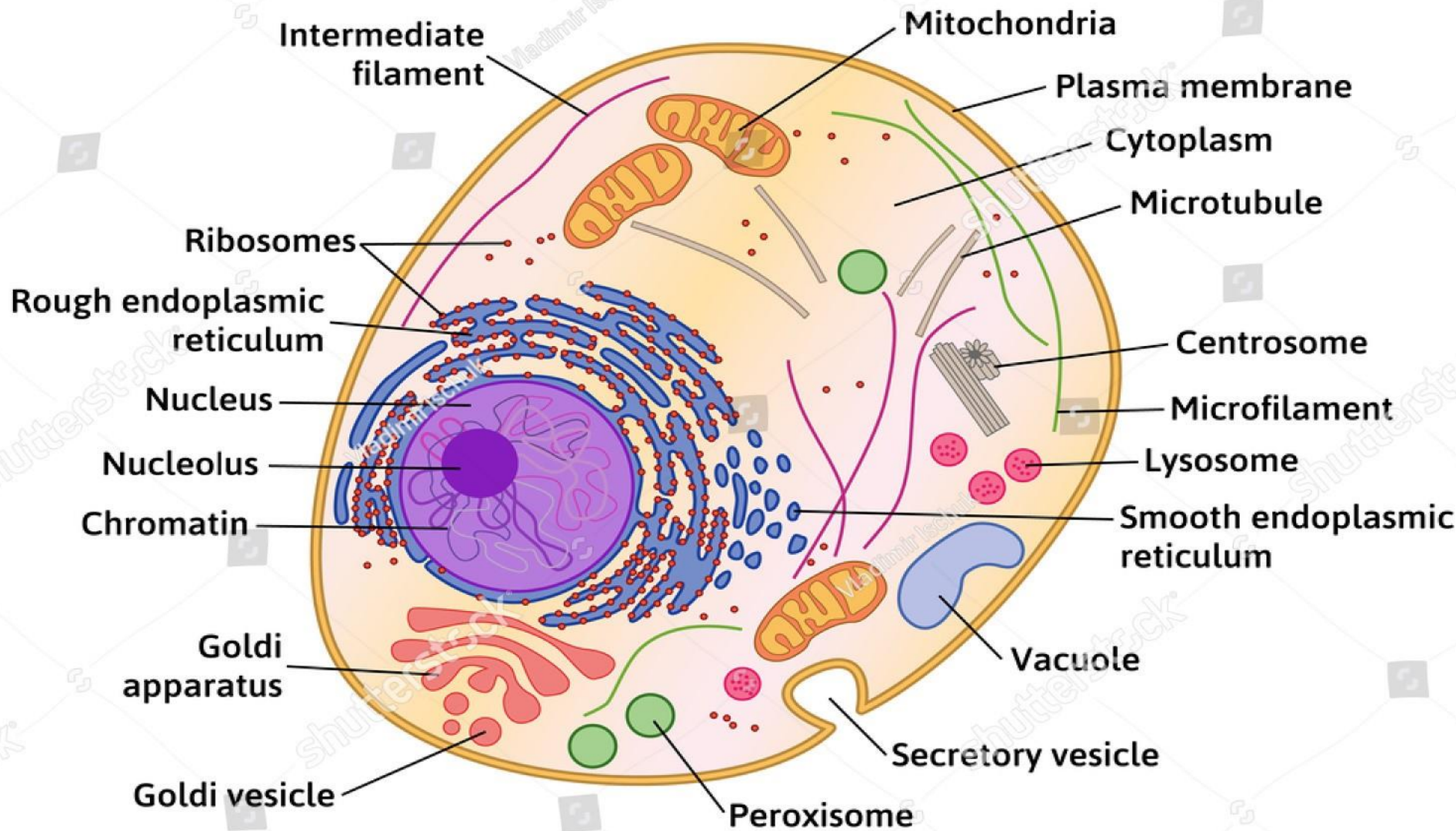
# Eukaryotic Cell

- Membrane bound Nucleus.
- Contains Cell Organelles.
- Linear DNA, Histones
- Unicellular to multicellular.



# Human cell





# **Prokaryote Cell**

**Size – small 1- 10  $\mu\text{m}$**

**Unicellular**

**Has single membrane and cell wall**

**No nucleus.**

**Circular DNA**

**No Histones.**

**Ribosomes – free in cytoplasm.**

**Cell division –amitosis**

**Ex- bacteria,rickettsia**

# **Eukaryote Cell**

**Large - 10 - 100  $\mu\text{m}$**

**Multicellular**

**Membrane bilayer.**

**Nucleus –well defined.**

**Linear DNA.**

**Histones**

**Membrane bound Organelles.**

**Cell division - mitosis.**

**Ex- animals**

# **Cell Structure :**

- Cell Membrane
- Cytoplasm and cell Organelles
- Nucleus

# Organelles

## Membranous organelles

- Endoplasmic reticulum
- golgi apparatus
- mitochondria
- peroxisomes
- lysosomes

# Organelles

## Non-membranous organelles

- Ribosomes
- Centrosome
- Proteasomes

## Cytoskeleton:

- ✓ microtubules
- ✓ micro filaments
- ✓ intermediate filaments

# Function of cell

- Provide structure and support
- Facilitate growth through mitosis
- Allow active and passive transport
- Produce energy
- Create metabolic reaction
- helps in reproduction

# **Plasma membrane or cell membrane**

**Definition of cell membrane :**The lining membrane that the envelops the cell is called cell membrane or plasma membrane.

It forms a selectively permeable boundary of the cell

**Thickness :** about 7.5–10 nanometers thick

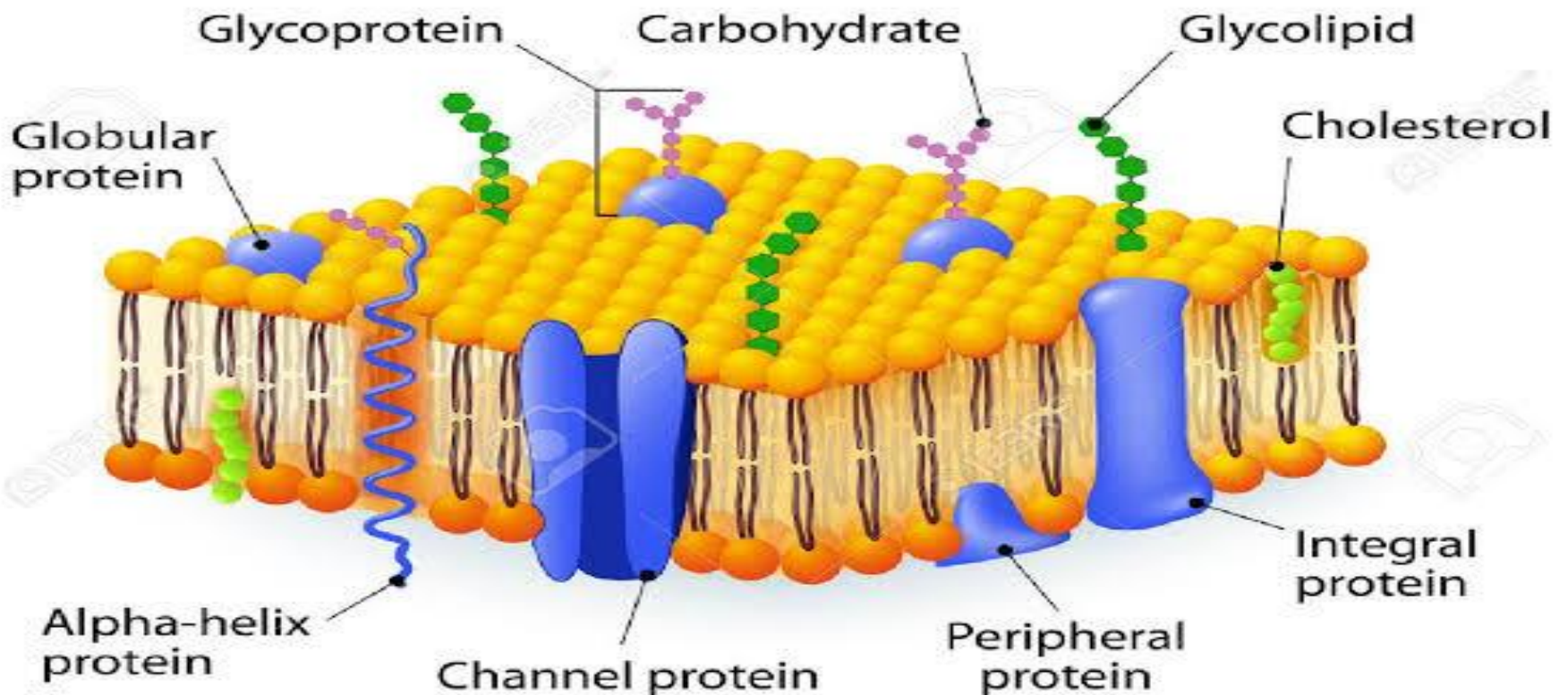


# Composition of cell membrane

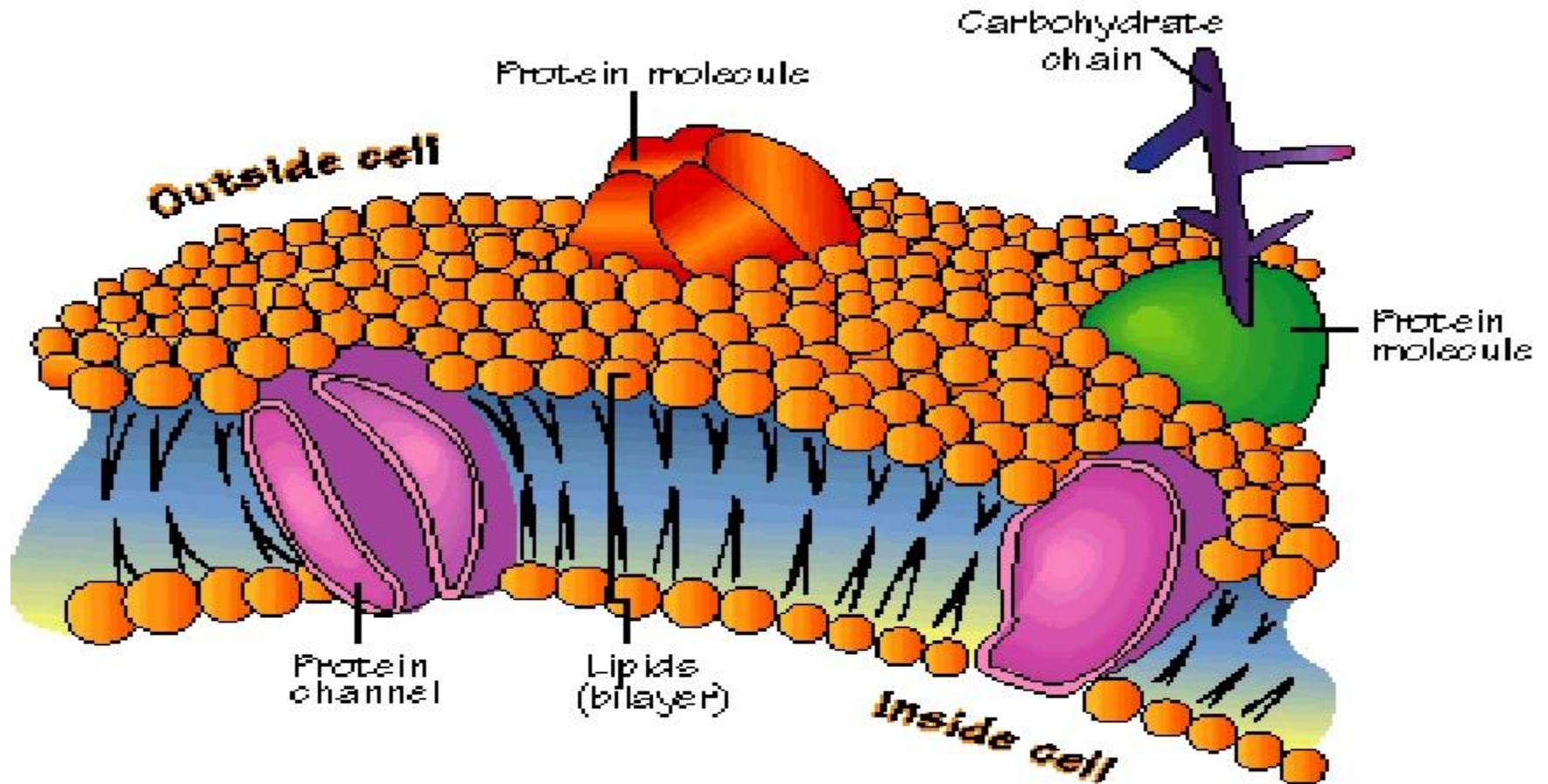
- Protein-55%
- Phospholipids-25%
- Cholesterol -13%
- Other lipid-4%

# structure of the cell membrane

## CELL MEMBRANE



# STRUCTURE OF THE CELL MEMBRANE



# Functions Of Plasma Membrane

- Keeps a cell intact
- Protective barrier
- Regulate transport in & out of cell (selectively permeable)
- Small lipid-soluble molecules, e.g. oxygen and carbon dioxide can pass easily
- Water can freely cross the membrane
- Interlocking surfaces bind cells together (junctions)
- Contains the cytoplasm (fluid in cell)