

# General characteristic of cell membrane and diffusion

Dr. Arwa rawashdeh

# Objectives

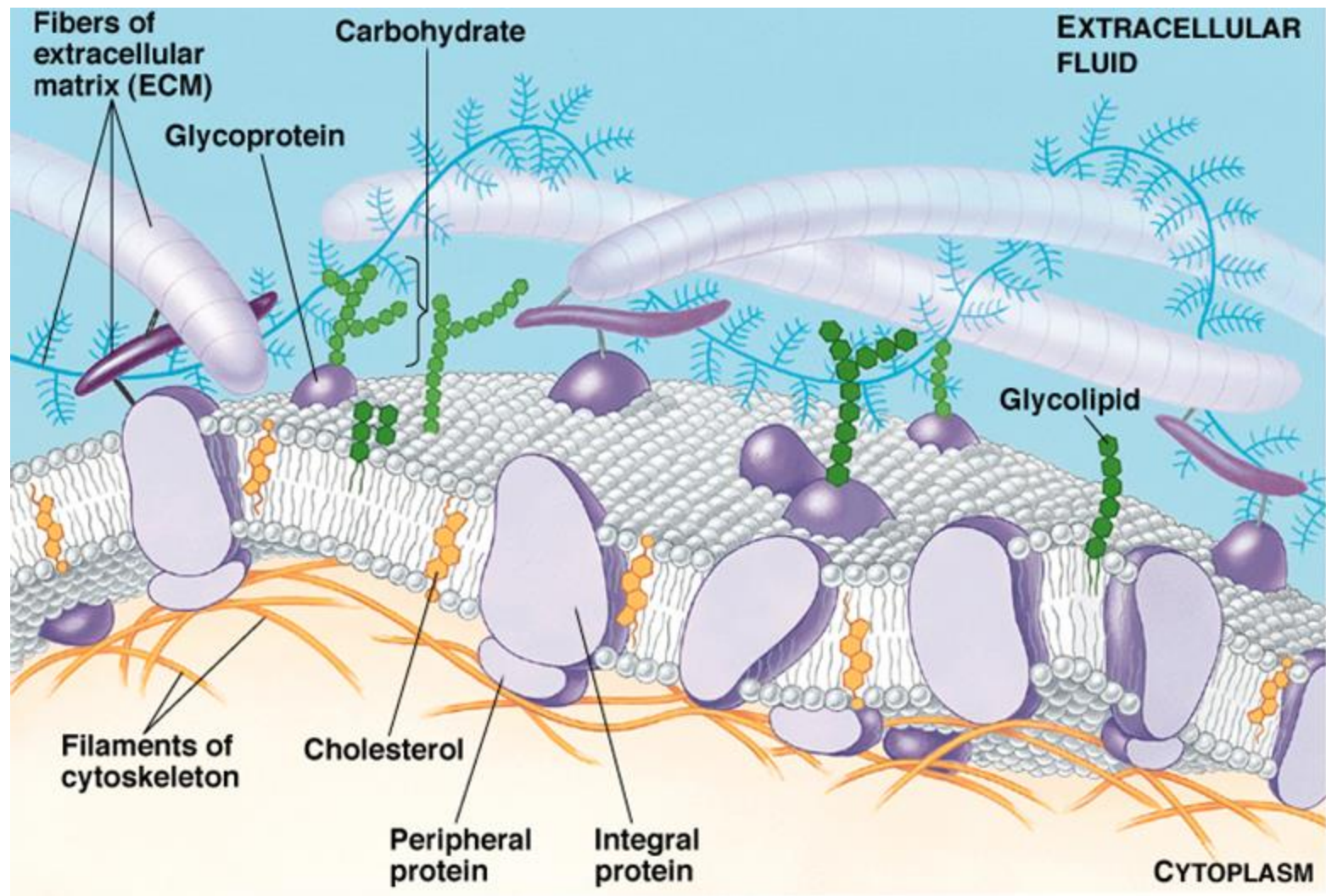
1. General characteristics of cell membrane
2. Passive transport of ions and molecules through the cell membrane; diffusion

# Membrane structure and function

- Cells must contain a cell membrane, cytoplasm and genetic material.
- The cell membrane is the edge, “boundary of life”, while the cytoplasm is the site of all the reactions of life and the genetic material is the information required for life.
- Selectively permeable means that the cell membrane allows some substances across more easily than others... some it helps and some it inhibits or rejects all together.

# Membrane Structure

- Phospholipids – phosphate and fatty acid tails
  - Hydrophilic phosphates
  - Hydrophobic fatty acid tails
- Two layers
  - With tails together
- Protein
  - Embedded throughout - integral
  - Some just surface – peripheral
  - Channel down concentration gradient
  - Carrier proteins against concentration gradient
  - Glycoprotein signaling



# Proteins - many functions within cell membrane

- Transport – substance across membrane, specificity to substance, active pumps
- Enzymatic activity – sequence reactions
- Transmit signals – conformational change when with substrate = message.
- Junctions – glue cells into tissues
- Recognition – glycoproteins act as targets or ID
- Attach to cytoskeleton – change shape of cell

# Fluid Mosaic Model

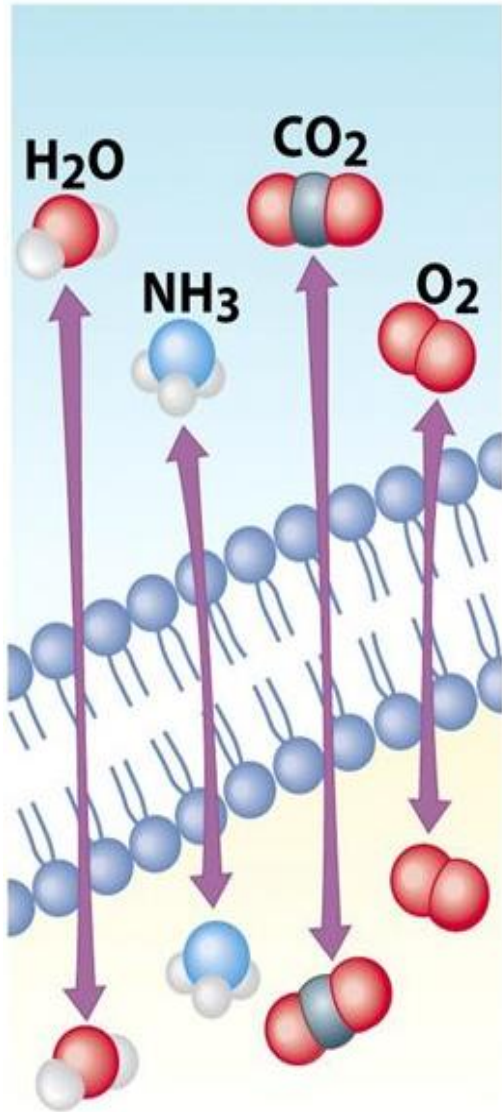
- Discovered in 1972
- Cholesterol molecules as a buffer prevent membrane from becoming 'crispy' increasing fluidity as temp decrease and decreasing fluidity as temp increase
- Increasing unsaturated fatty acids increasing fluidity

# Moving across the membrane

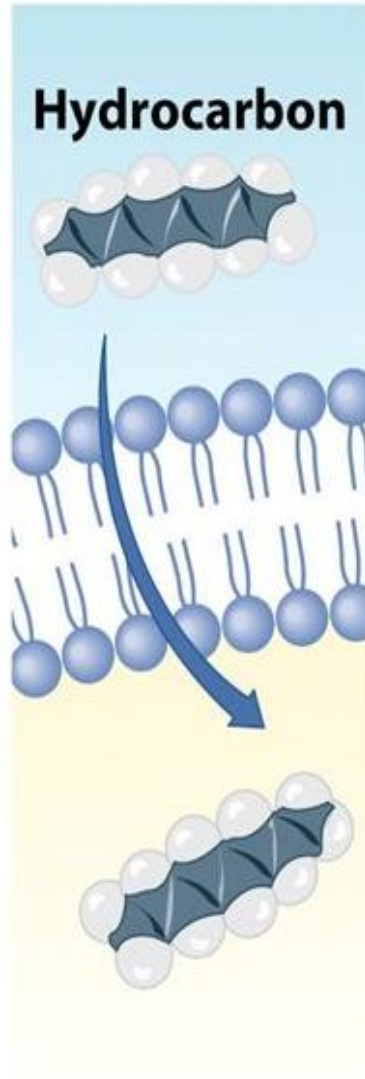
- Small nonpolar molecules like CO<sub>2</sub> and O<sub>2</sub> can dissolve in lipid layer (hydrophobic )
- Small polar molecules like water can pass slowly
- Large but nonpolar like benzene can pass the cell membrane used in labs to wash the hands
- Large and polar like glucose can't pass the cell membrane
- ion charged molecules can't pass the cell membrane



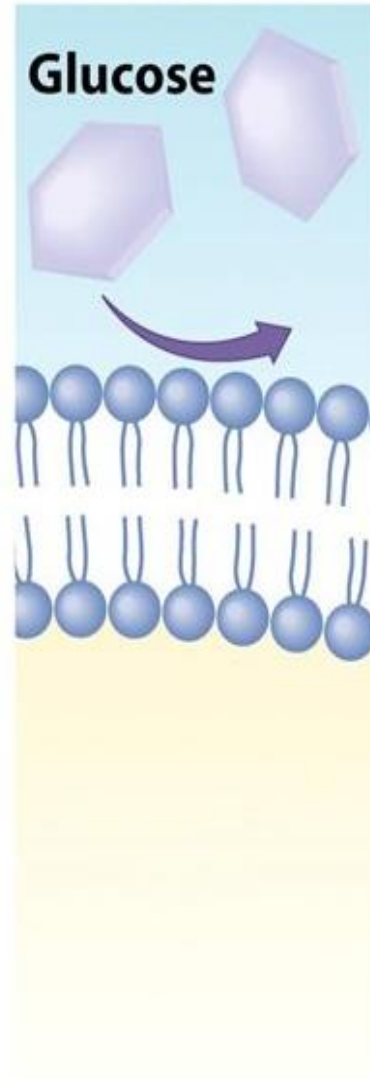
(a)  
Small uncharged  
molecules



(b)  
Lipid-soluble  
substances



(c)  
Water-soluble  
substances



(d)  
Ions

