# CELL MEMBRANE

DR. AHMED HASAN MOHAMMED

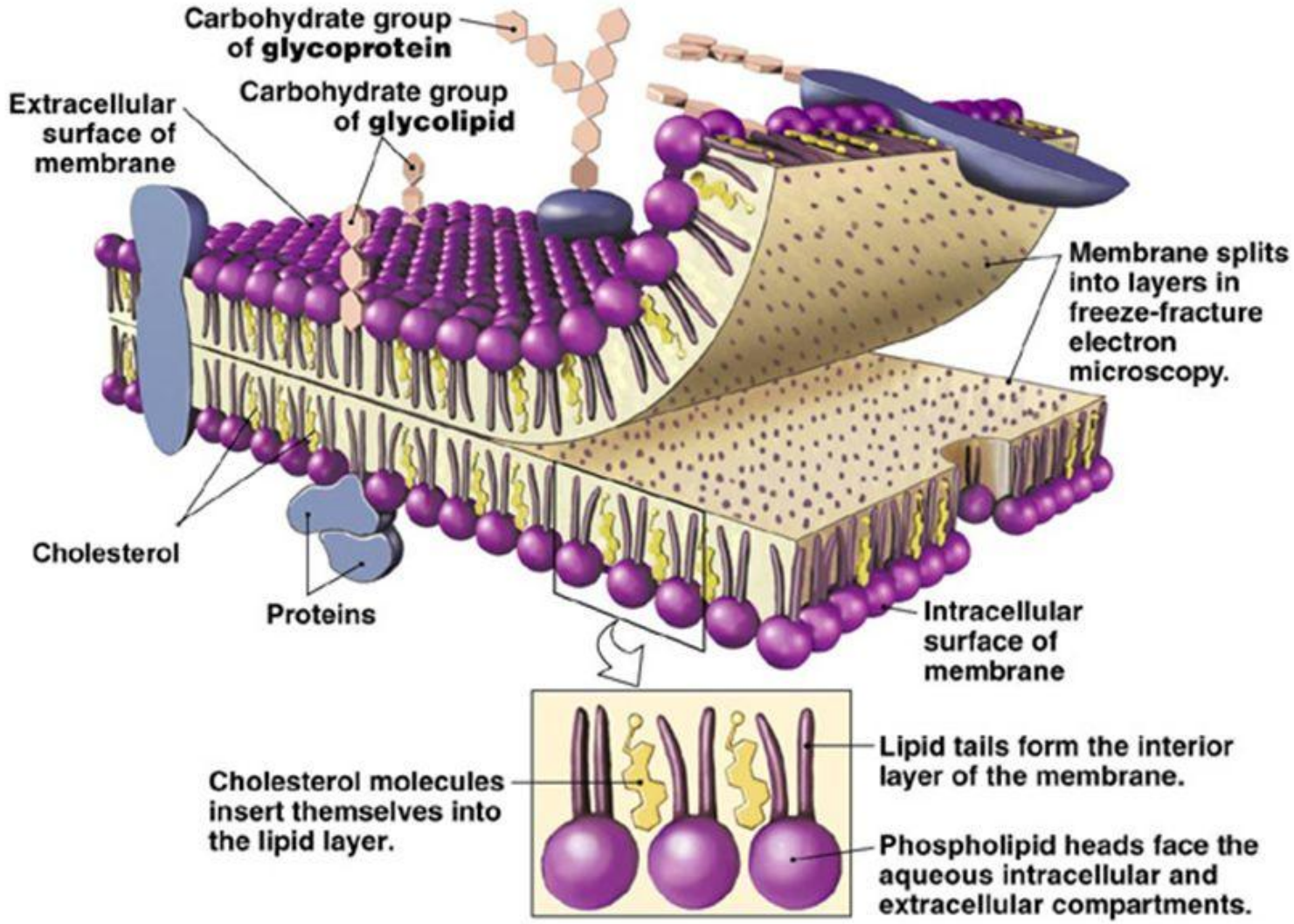
# DEFINITION

- Biological membranes surround cells and serve to keep the insides separated from the outsides.
- They are formed of phospholipid bilayers, which by definition are a double layer of fatty acid molecules (mostly phospholipids, lipids containing lots of phosphorus).
- Proteins serve very important functions in cellular membranes.

# PHOSPHOLIPID

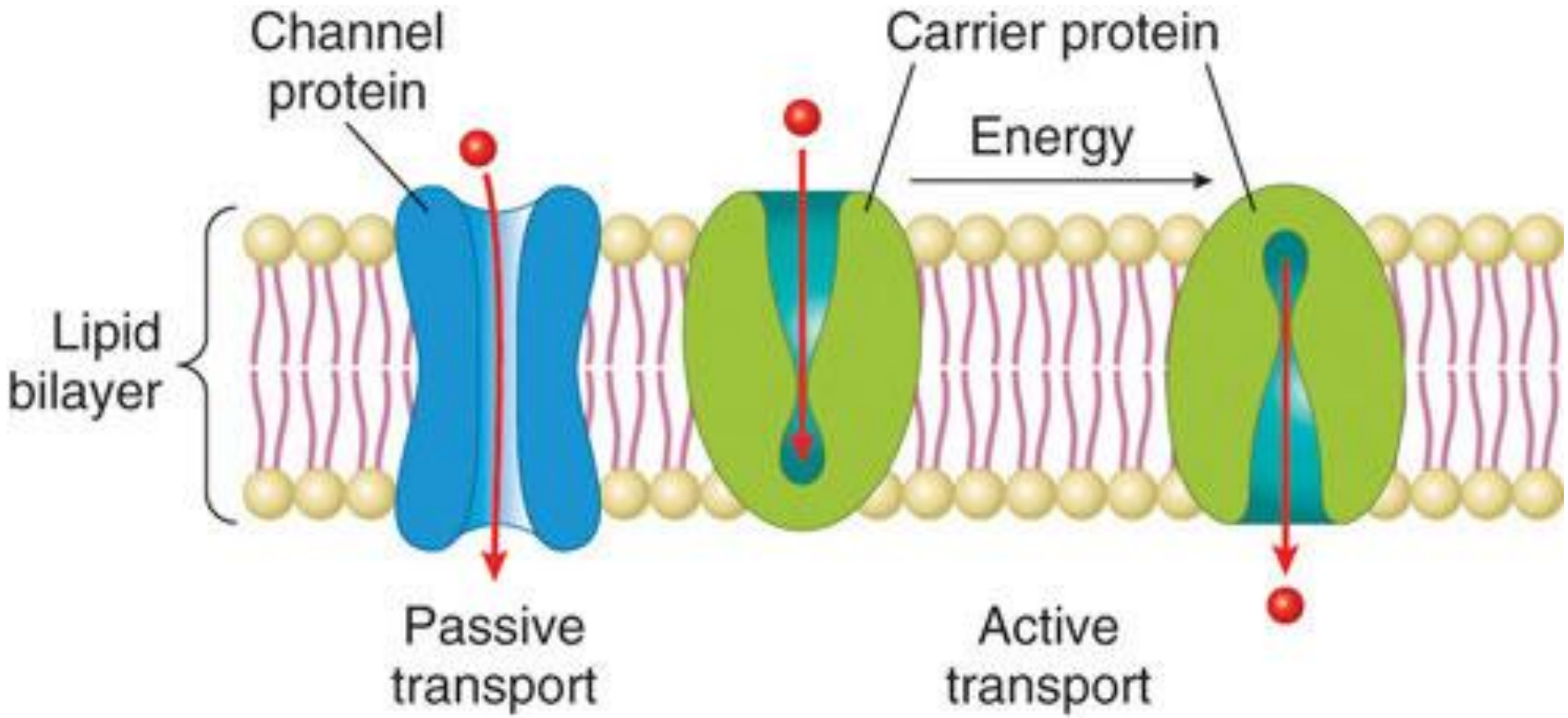
- Basis of biological membranes and cellular organisms contains a charged, hydrophilic (attracted to water) head and two hydrophobic (repelled by water) hydrocarbon tails.
- In presence of water, phospholipids form bilayer maximize hydrogen bonds between water creates barrier to passage of materials.
- Fluid mosaic model shows horizontal (common) and "flip-flop" (rare) movement of phospholipids

# The Fluid Mosaic Model



# MEMBRANE PROTEINS

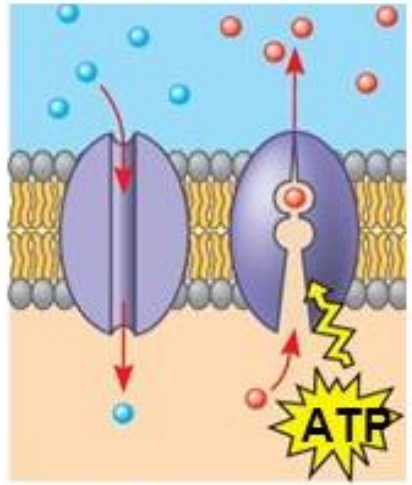
- Transport channels
- Enzymes
- Cell surface receptors
- Cell adhesion proteins
- Attachments to cytoskeleton
- Carrier protein


Channel protein
Carrier protein
Energy
Lipid bilayer
Passive transport
Active transport

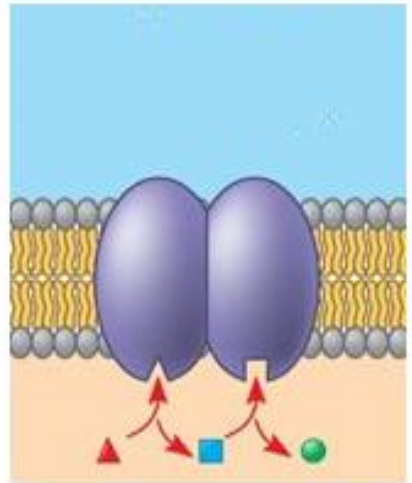
inside the cell

outside the cell

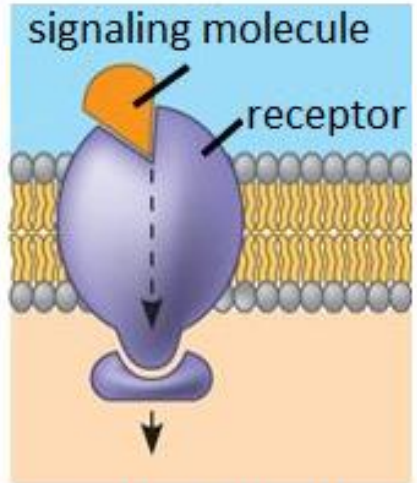
membrane



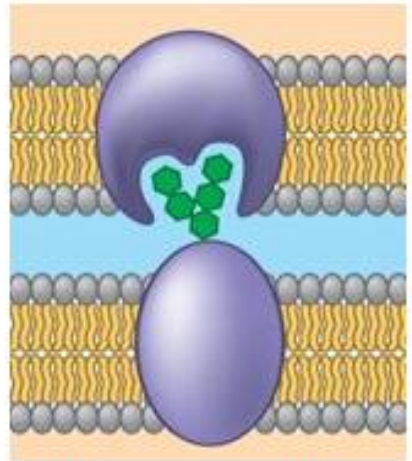

Transport



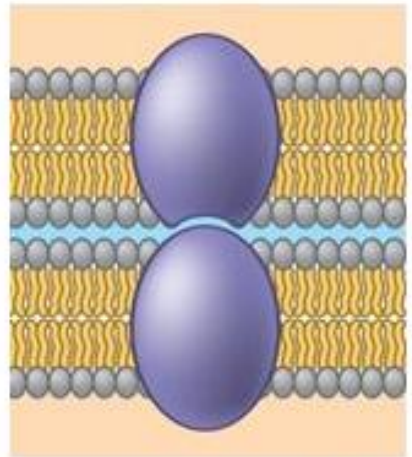
Enzymatic activity



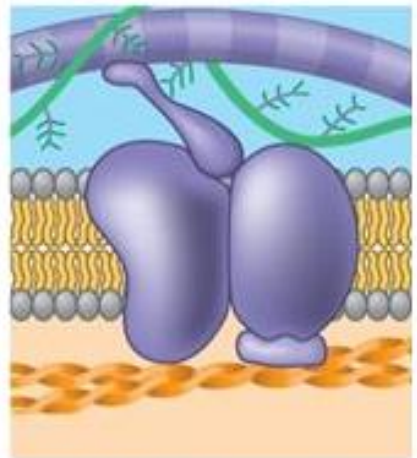

Signal transduction



Cell-cell recognition



Intercellular joining



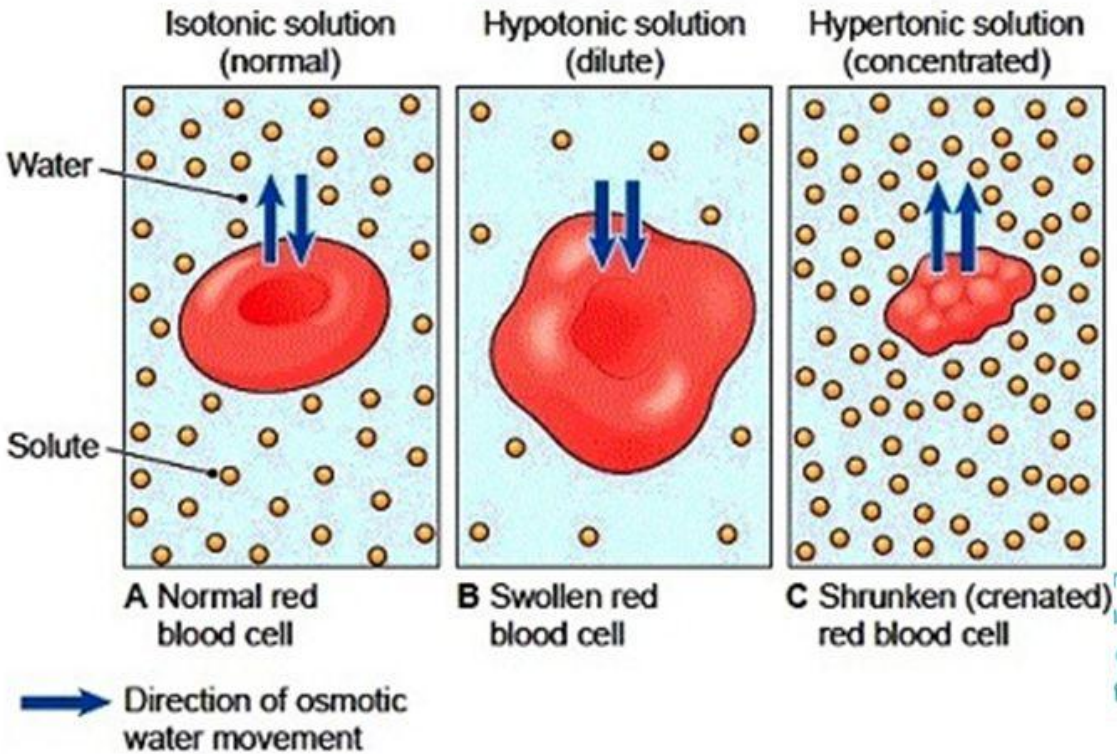
Attachtment

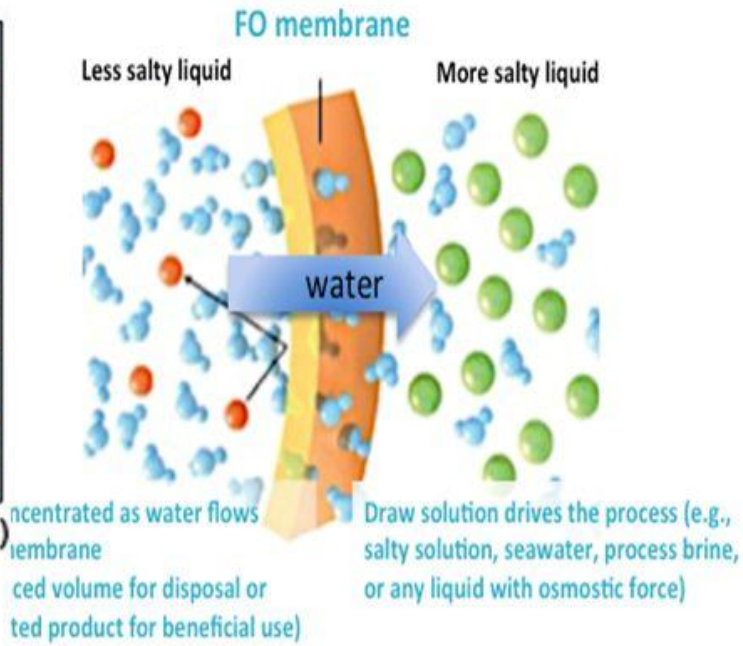
# OSMOSIS

- Diffusion of water down concentration gradient
- Hyperosmotic solution: higher concentration of solutes
- Hypoosmotic solution: lower concentration of solutes
- Isoosmotic solution: solute concentrations equal

# Osmosis

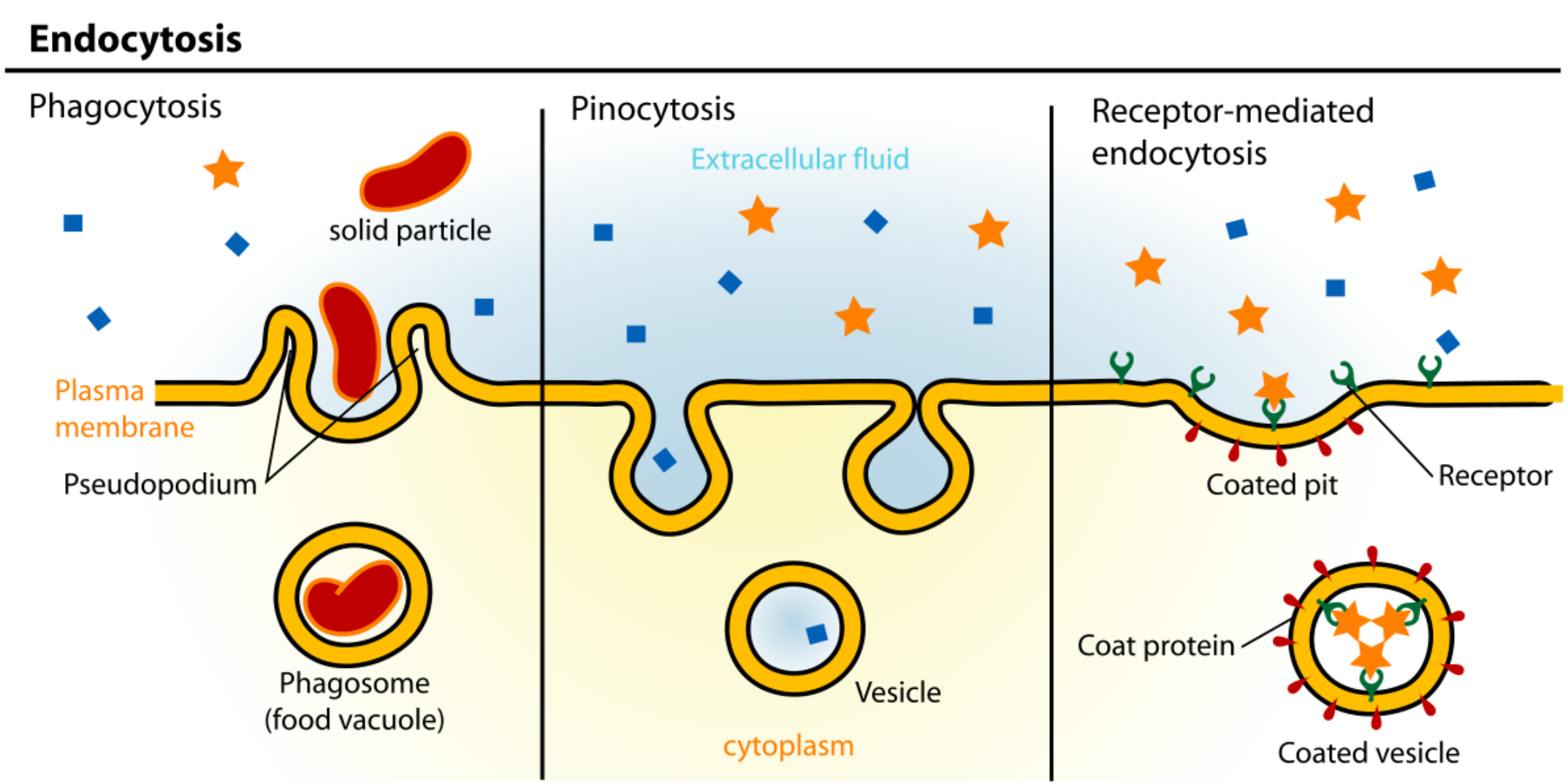
- The movement (diffusion) of water through a cell membrane
- Type of passive transport (does not require energy)



# ENGULFMENT

- Endocytosis: energy requiring
- Phagocytosis: Solid material, typically food
- Pinocytosis: Primarily liquid


Endocytosis
Phagocytosis
Pinocytosis
Receptor-mediated endocytosis
Extracellular fluid
solid particle
Plasma membrane
Pseudopodium
Phagosome (food vacuole)
Vesicle
cytoplasm
Coated pit
Receptor
Coat protein
Coated vesicle