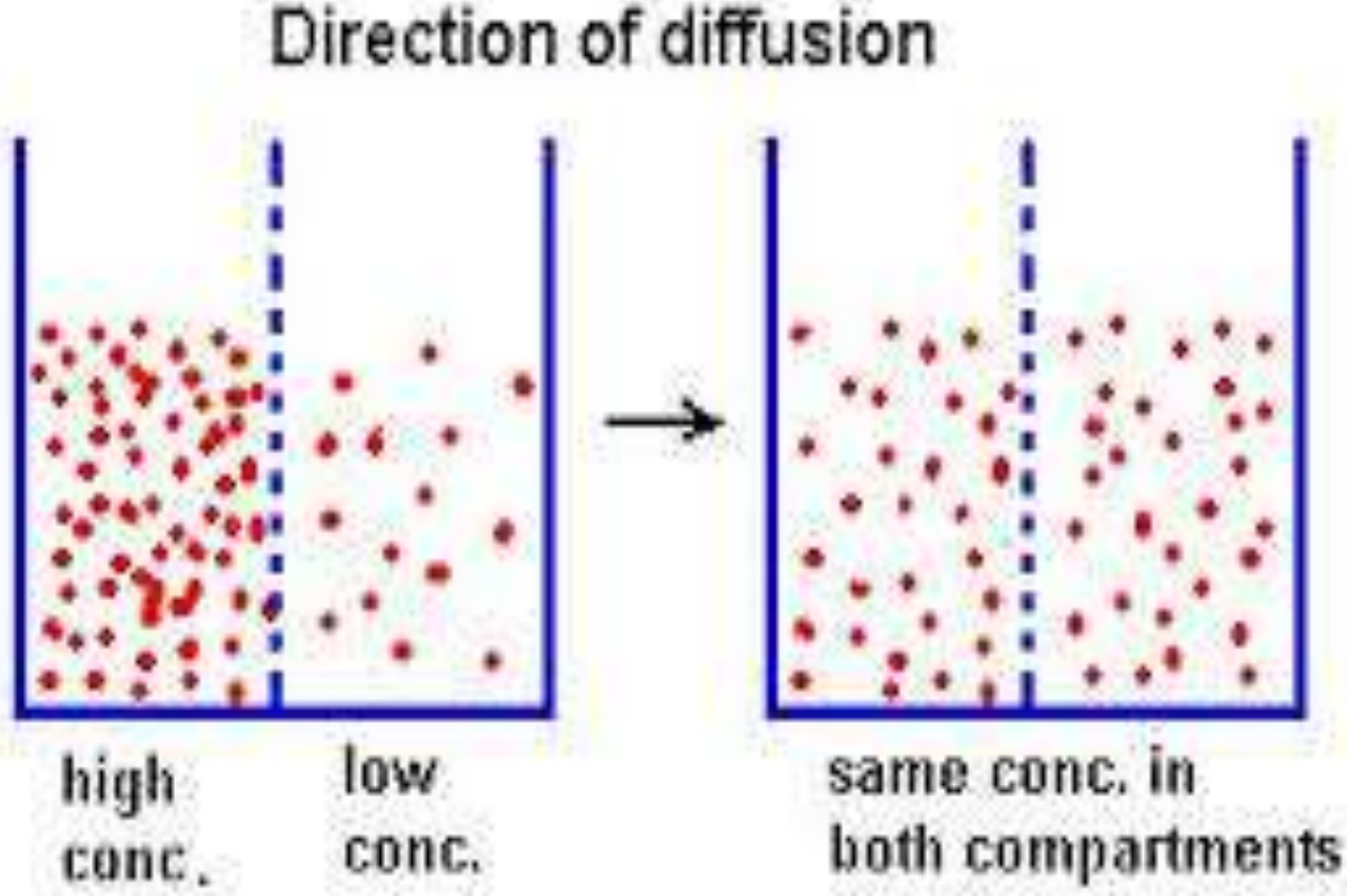
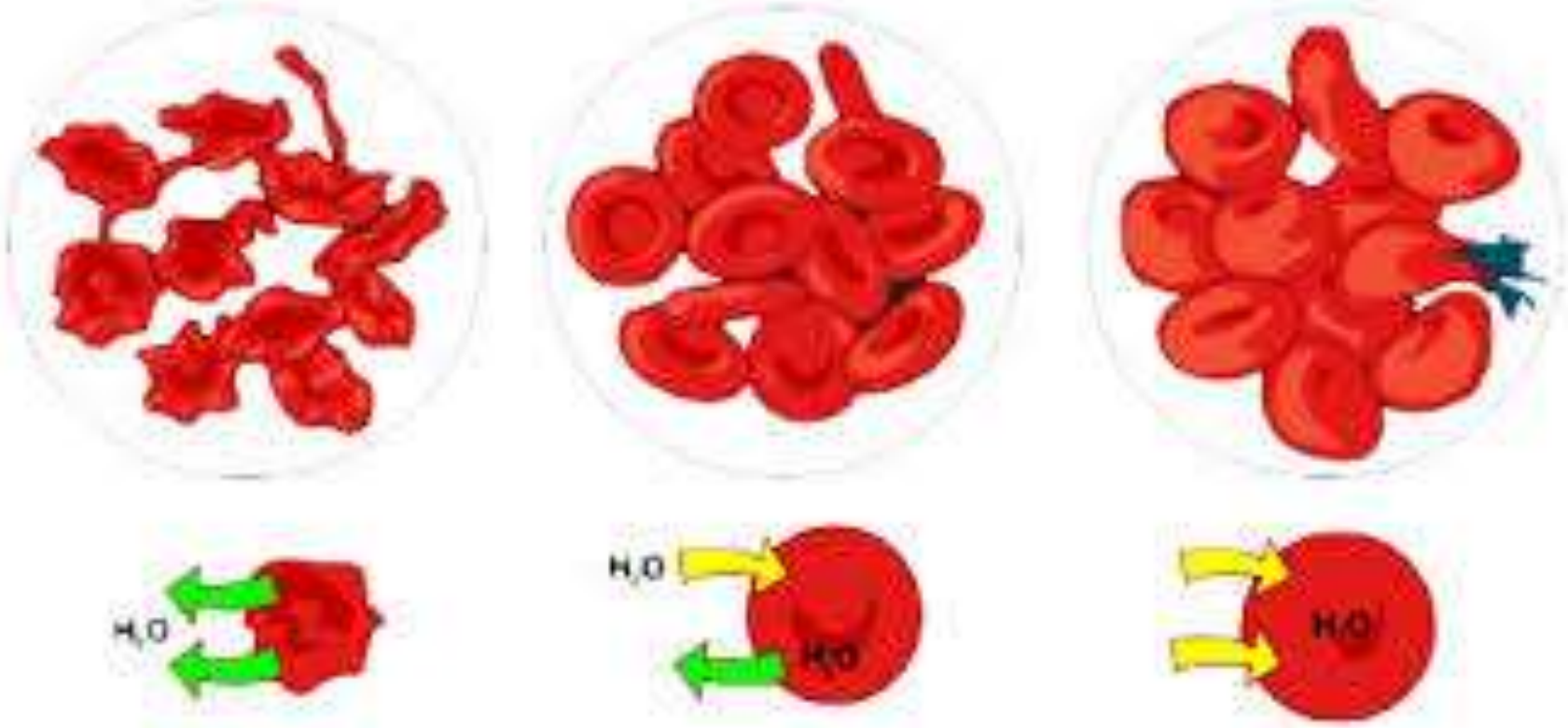
Transport across the cell membrane

- **Passive transport** does NOT require energy
  - Diffusion – small uncharged molecules
  - Osmosis - water
  - Facilitated diffusion - glucose
- **Active transport** REQUIRES ENERGY
  - Ion pumps
  - Endocytosis
  - Exocytosis

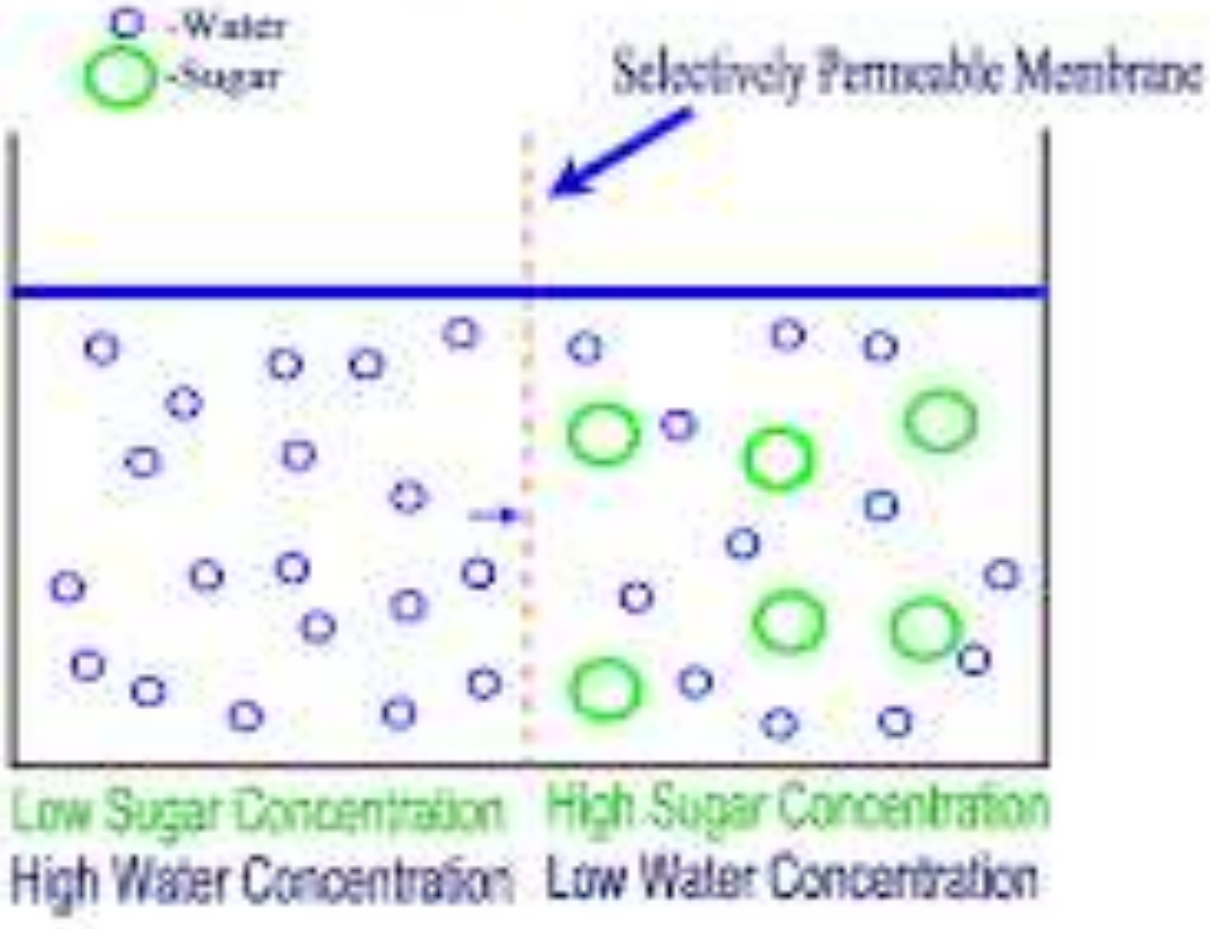
MEMBRANE TRANSPORT

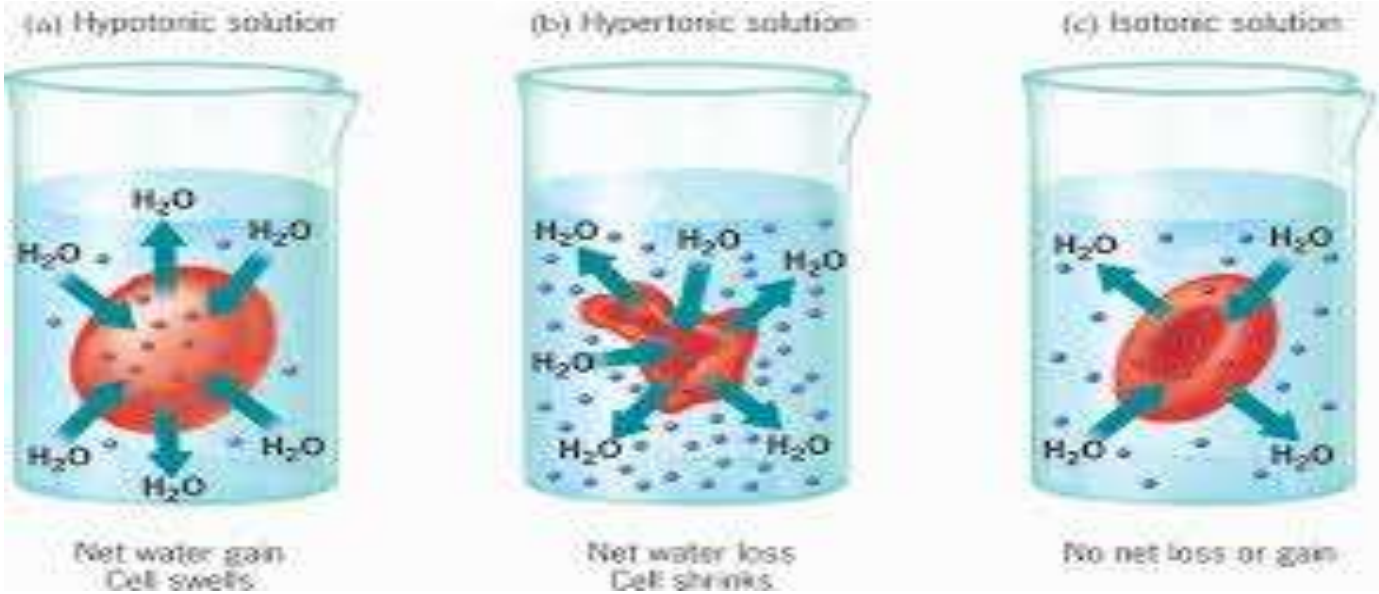
PASSIVE TRANSPORT	ACTIVE TRANSPORT
NO ENERGY NEEDED NO ATP REQUIRED	REQUIRES THE USE OF ENERGY IN THE FORM OF ATP
DOWN A CONCENTRATION GRADIENT FROM HIGH TO LOW CONCENTRATION	AGAINST A CONCENTRATION GRADIENT FROM LOW TO HIGH CONCENTRATION
FACILLITATED DIFFUSION REQUIRES THE USE OF PROTEIN CARRIER/TRANSPORT MOLECULES	SOME TYPES REQUIRE THE USE OF PROTEIN CARRIER/TRANSPORT MOLECULES
INCLUDES OSMOSIS AND SIMPLE DIFFUSION WHICH DO NOT REQUIRE ANY SPECIAL PROTEIN CARRIER/TRANSPORT MOLECULES	INCLUDES ENDOCYTOSIS – MOVEMENT OF LARGE MOLECULES INTO A CELL (CELL MEMBRANE FOLDS AROUND THE MOLECULES)

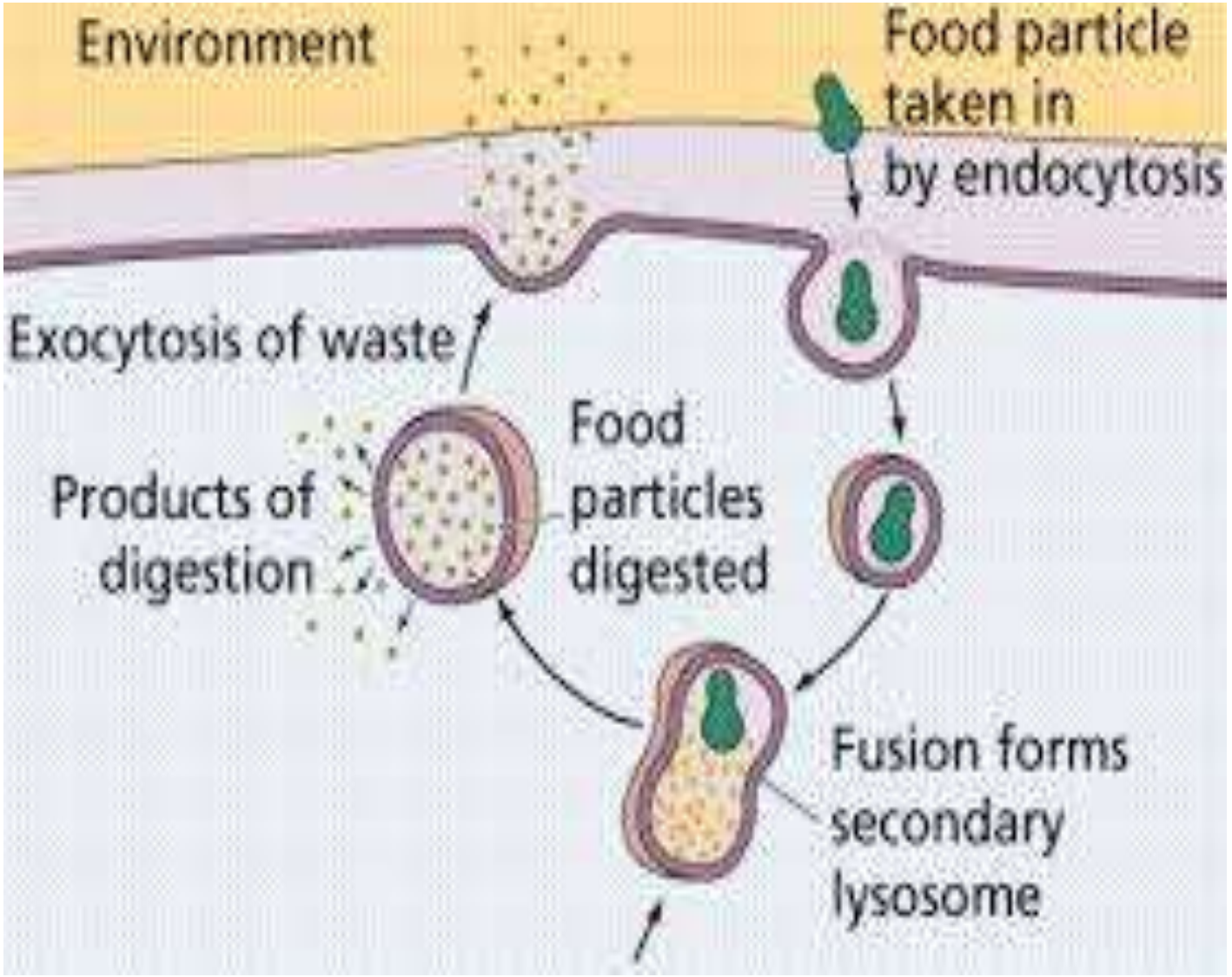

Direction of diffusion
high conc.
low conc.
same conc. in both compartments


H2O
H2O
H2O
H2O

Osmosis


-Water
-Sugar
Selectively Permeable Membrane
Low Sugar Concentration
High Water Concentration
High Sugar Concentration
Low Water Concentration


(a) Hypotonic solution
H_2O
H_2O
H_2O
H_2O
H_2O
H_2O
Net water gain
Cell swells
(b) Hypertonic solution
H_2O
H_2O
H_2O
H_2O
H_2O
H_2O
Net water loss
Cell shrinks
(c) Isotonic solution
H_2O
H_2O
H_2O
H_2O
No net loss or gain


Environment
Food particle taken in by endocytosis
Exocytosis of waste
Products of digestion
Food particles digested
Fusion forms secondary lysosome