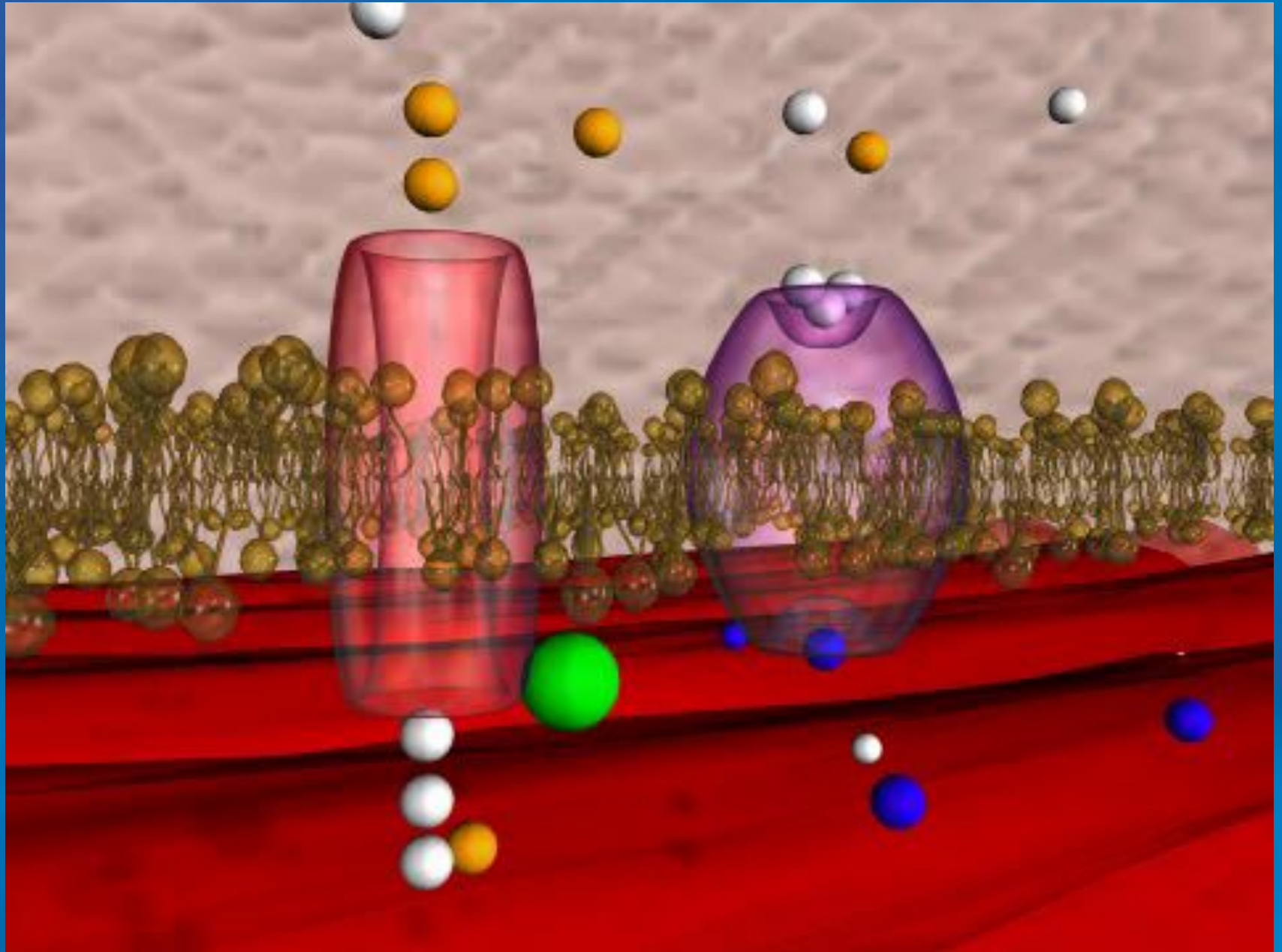


STRUCTURE &
FUNCTIONS OF
BIOLOGICAL MEMBRANES

TRANSPORT FUNCTION



BILIPID LAYER PENETRABILITY

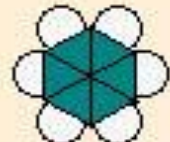
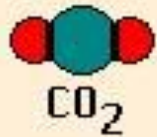
SMALL
MOLECULES

BIG
MPLECULES

IONS

GASES

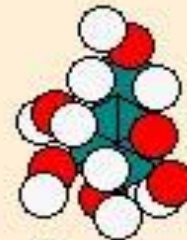
HYDROPHOBIC
MOLECULES



Benzene



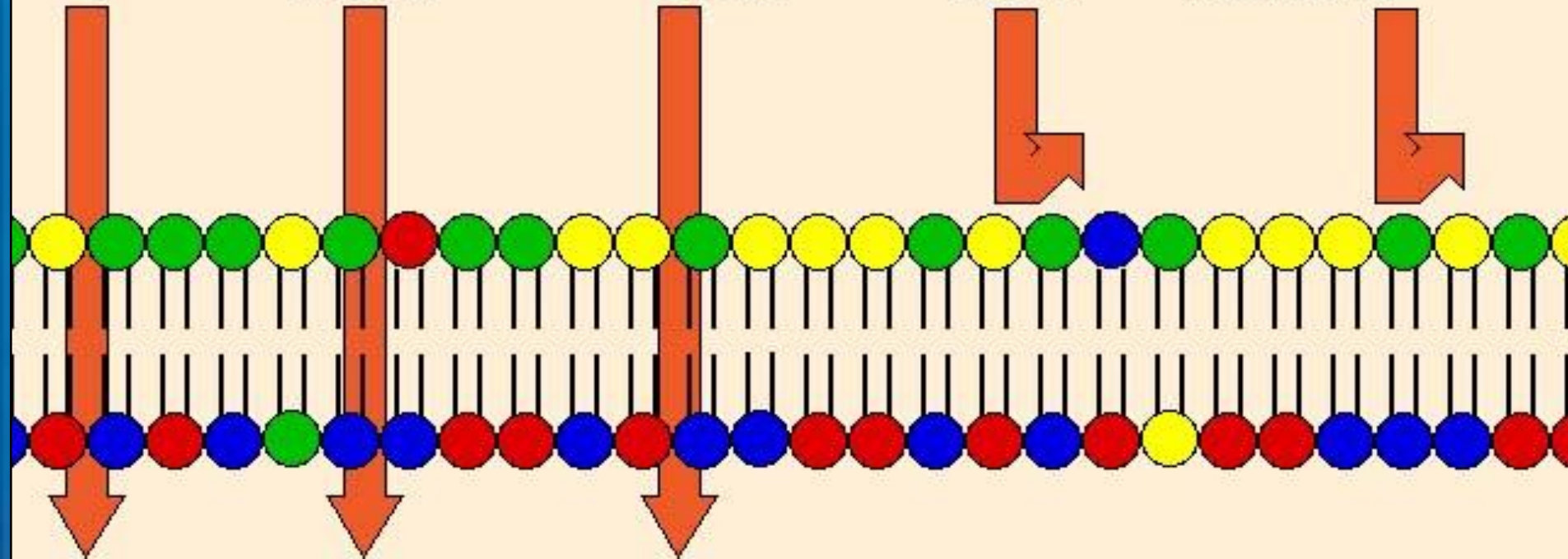
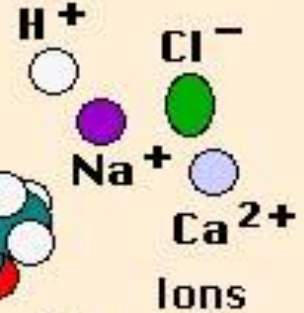
Ethanol



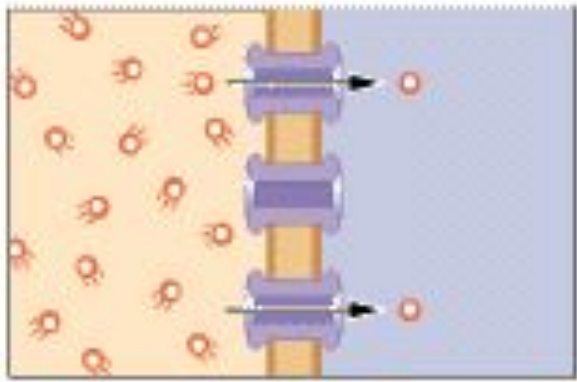
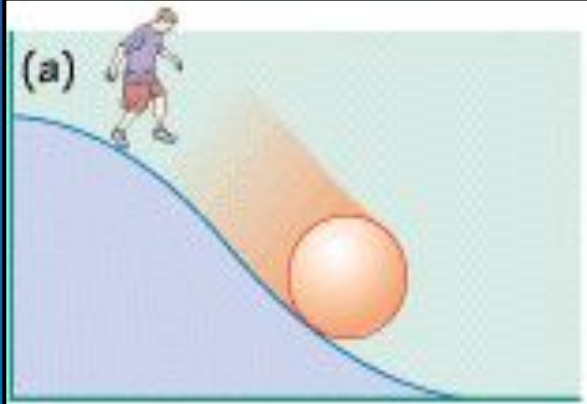
Glucose



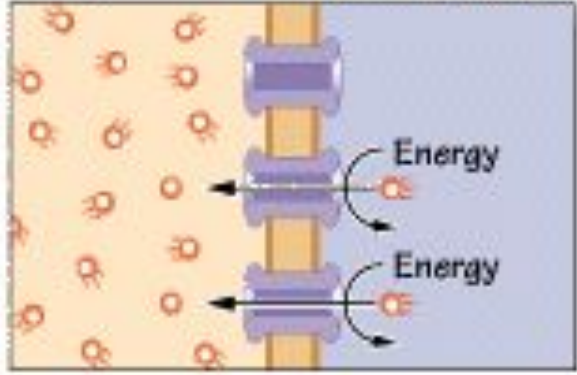
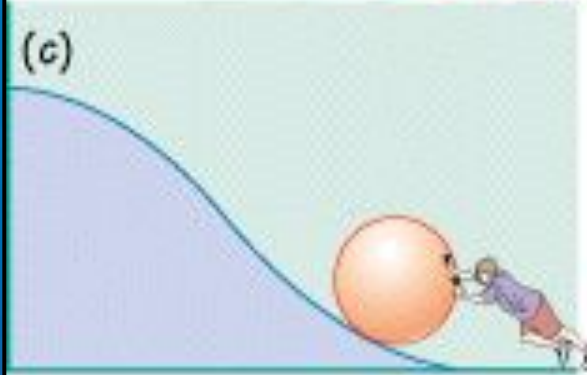
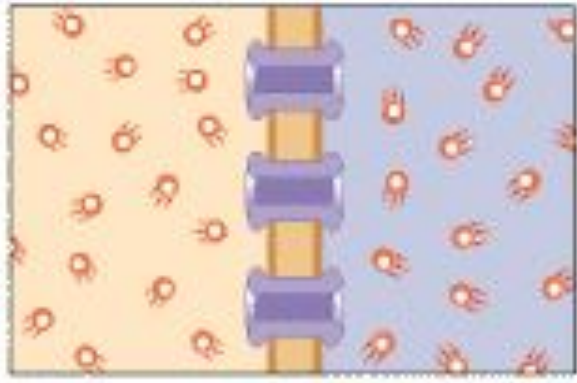
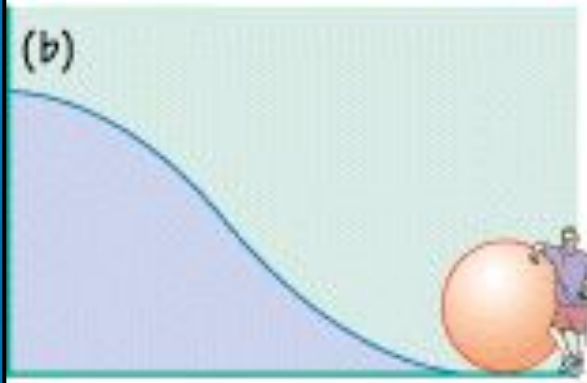
Amino acids



MEMBRANE TRANSPORT FUNCTION

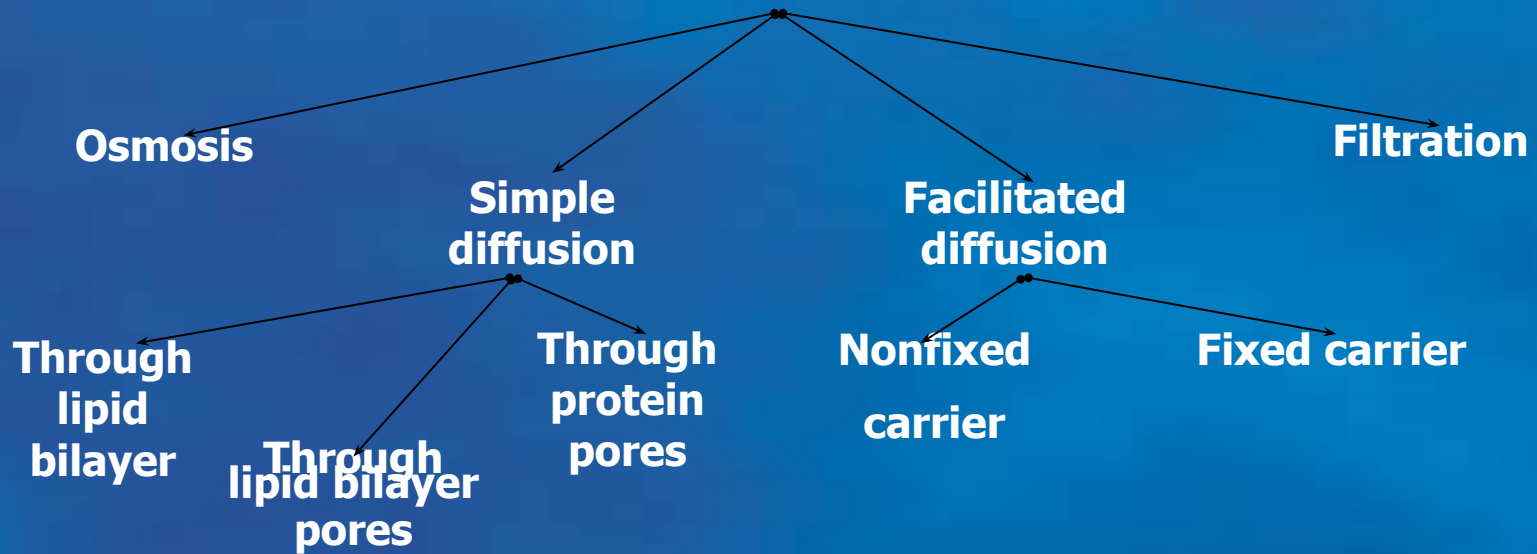


PASSIVE TRANSPORT

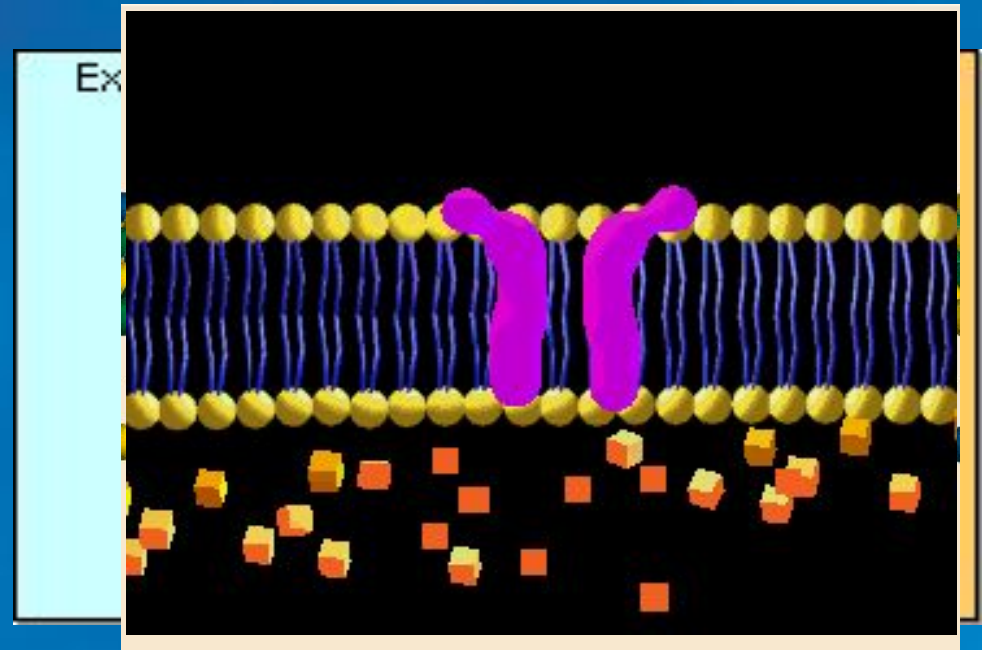


ACTIVE TRANSPORT

PASSIVE TRANSPORT



$$\frac{dm}{dt} = -D \frac{dc}{dx} S$$



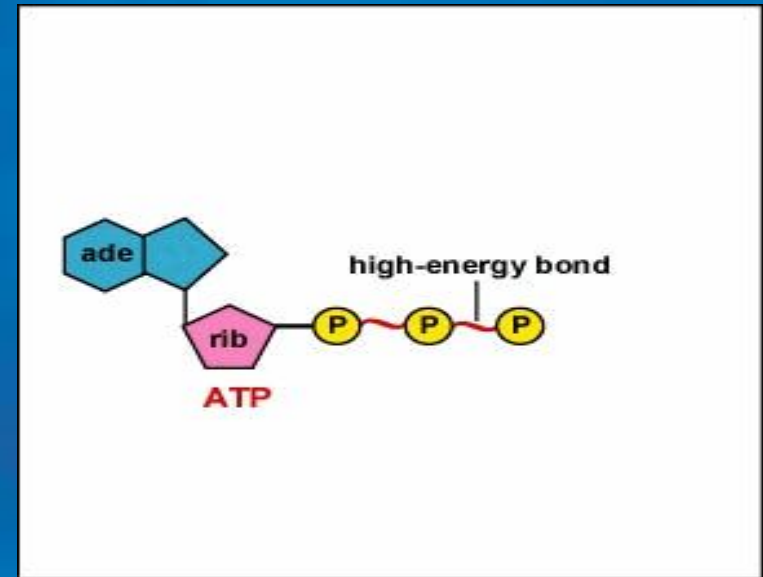
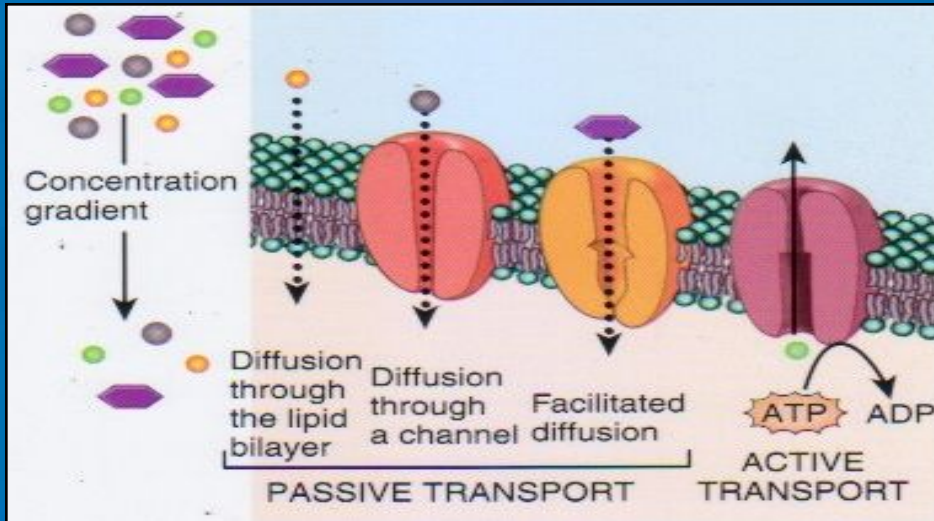
ACTIVE TRANSPORT

ION PUMPS

SECONDARY ION
TRANSPORT

ENDOCYTOSIS

EXOCYTOSIS

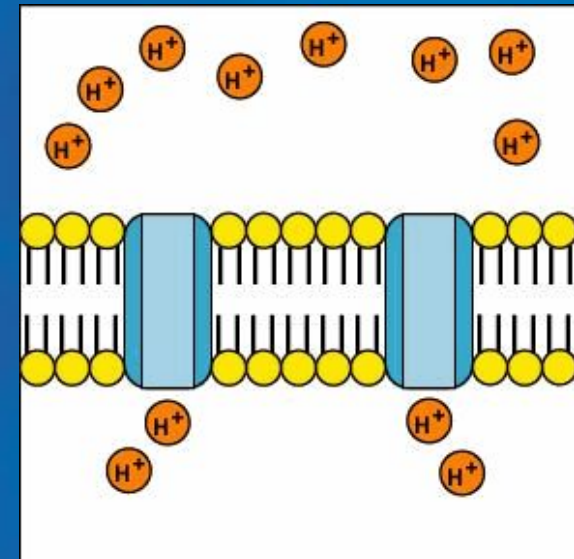
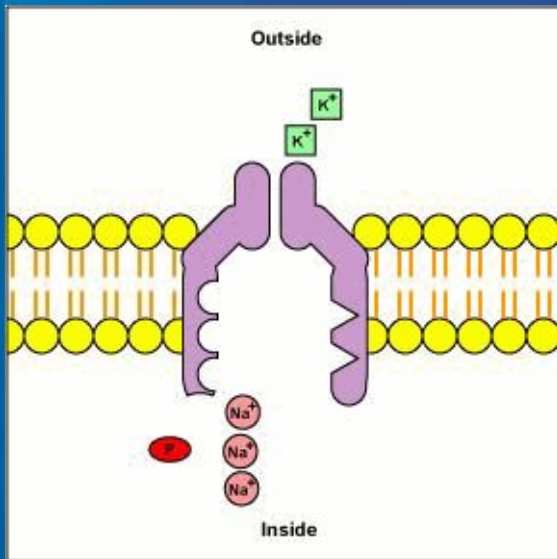


ION PUMPS

K^+ - Na^+ pump

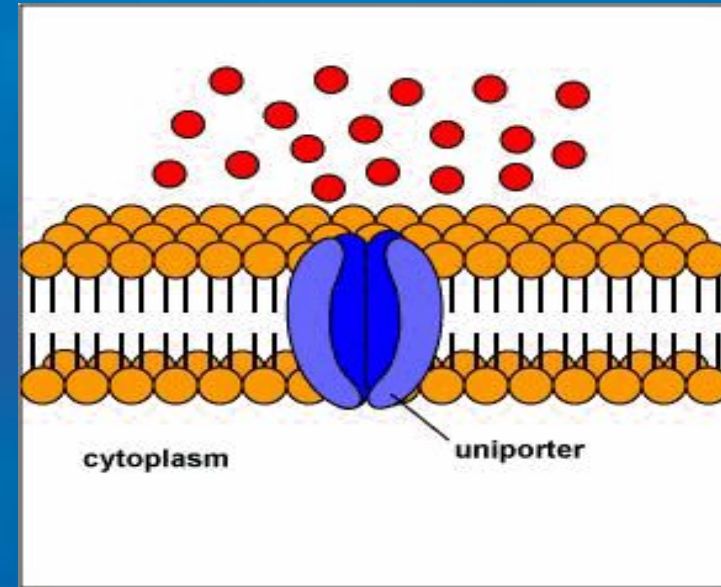
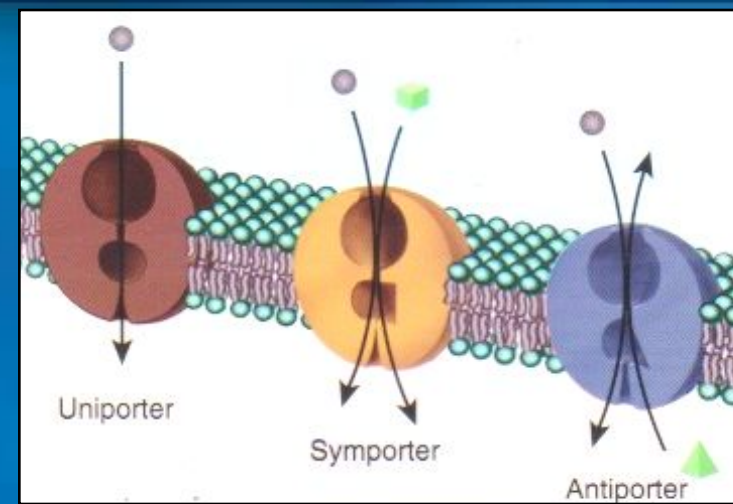
Ca^{2+} pump

H^+ or proton pump



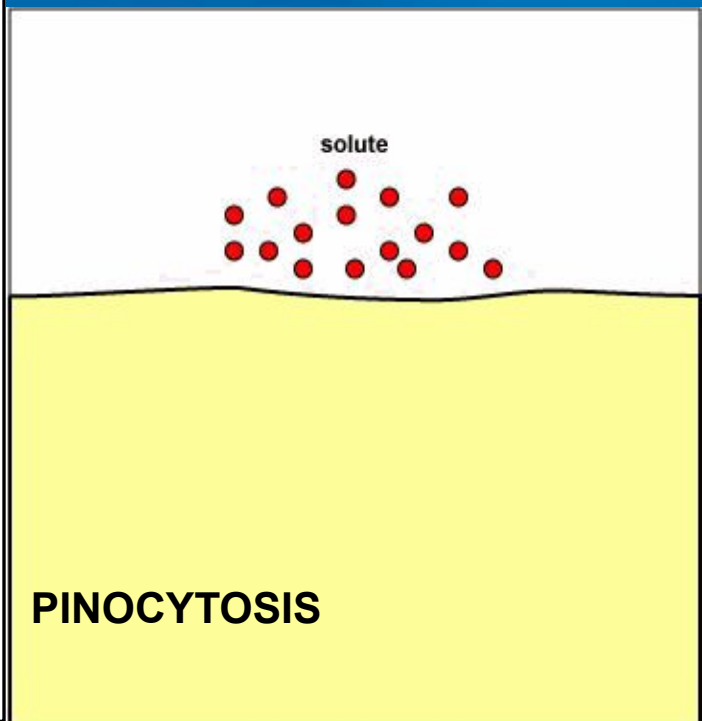
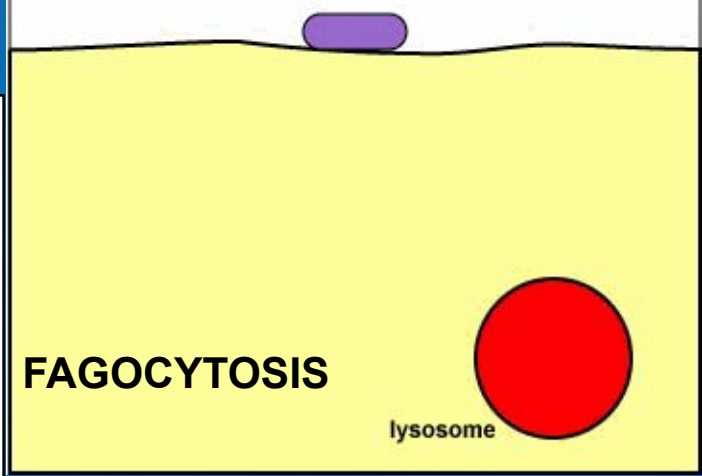
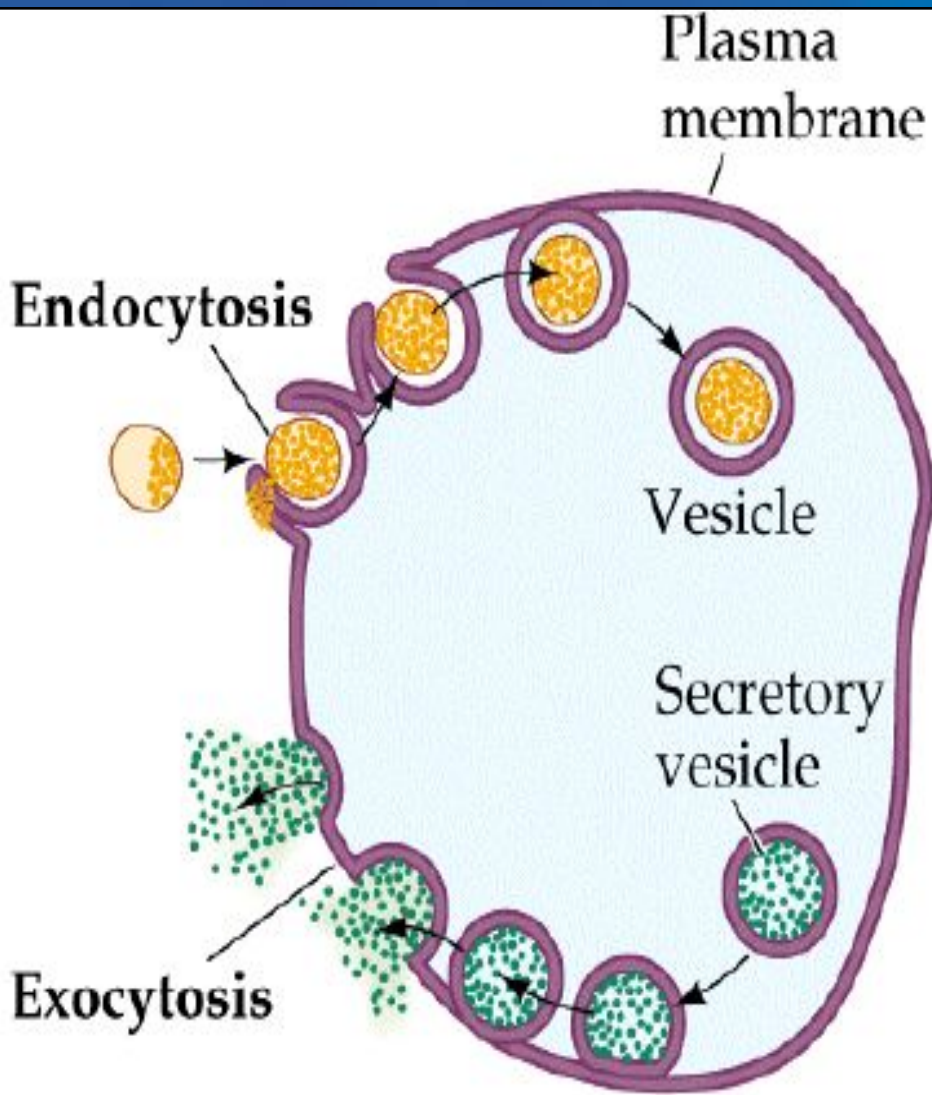
SODIUM-POTASSIUM PUMP

Secondary active transport

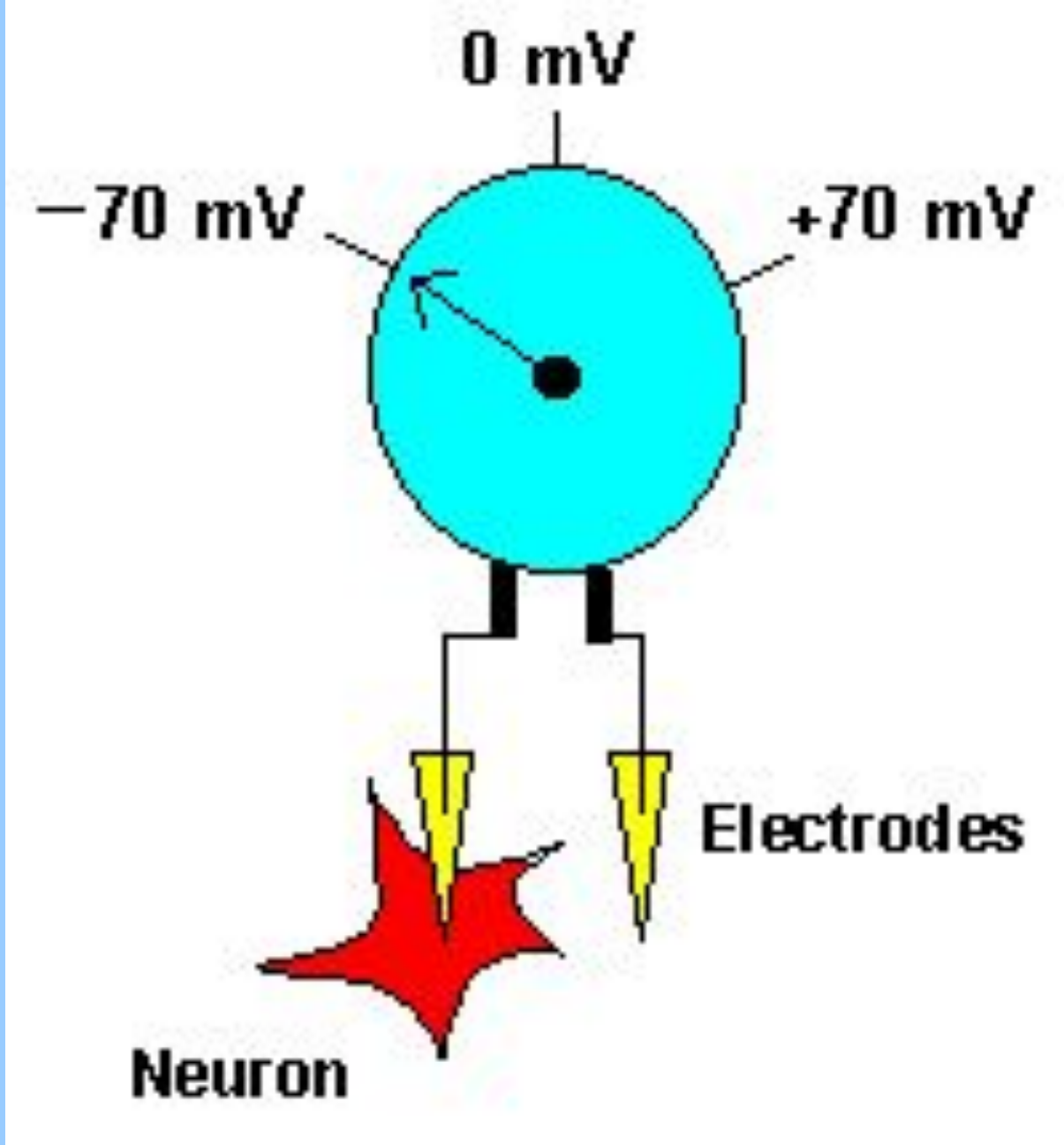


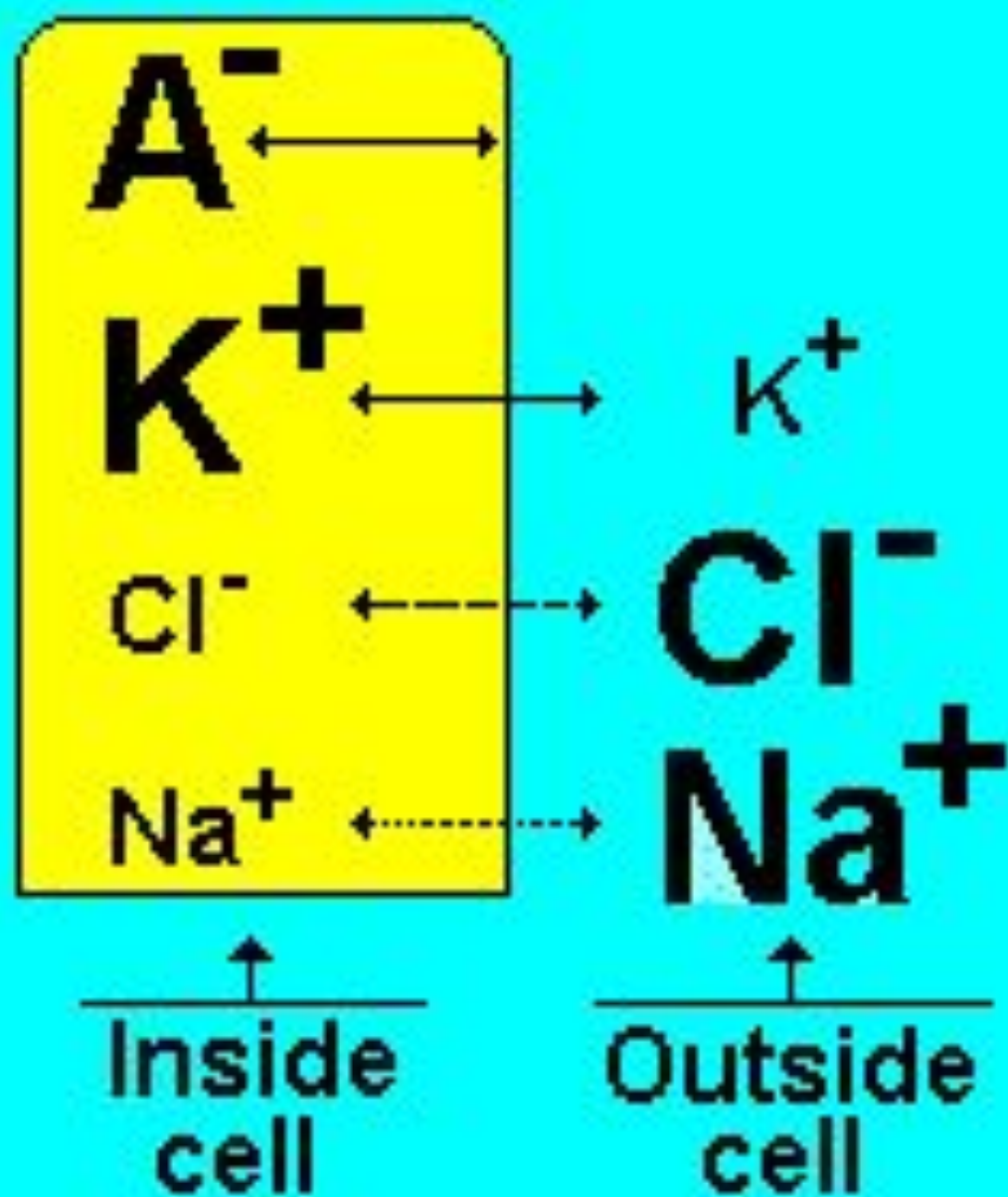
ENDO- & EXOCYTOSIS

ENDOCYTOSIS KINDS



REST AND ACTION POTENTIALS OF THE CELL





$$E_m = \frac{RT}{zF} \ln \left(\frac{P_K[K^+]_{\text{out}} + P_{\text{Na}}[\text{Na}^+]_{\text{out}} + P_{\text{Cl}}[\text{Cl}^-]_{\text{in}}}{P_K[K^+]_{\text{in}} + P_{\text{Na}}[\text{Na}^+]_{\text{in}} + P_{\text{Cl}}[\text{Cl}^-]_{\text{out}}} \right)$$

