		Summary: Transport across Membranes				
Is Energy Required for the Mechanism to Function?		Type of Cellular Transport Mechanism	Direction of Movement of Substances	Essential Related Factor(s)	Examples of Transported Substances	
NO		Simple Diffusion	Solute moves from an area of high concentration to an area of low concentration (with the gradient) If the solute is <i>water</i> this movement is referred to as <i>osmosis</i>	Concentration gradient	Carbon dioxide, oxygen, water, glycerol	
NO		Facilitated diffusion	Solute moves from an area of high concentration to an area of low concentration (with the gradient)	Concentration gradient & a channel or carrier protein	Water (aquaporins), simple sugars, amino acids, ions	
YES – ATP		Primary Active transport	Solute moves from an arcs of ow concentrative to an area of high Concentration (against the gradient)	Protein pump and energy	Suga aci	rs, amnio ds, ions
YES electroch gradient ion	– nemical (driving)	Secondary active transport	Symport -solute moves in same direction as the gradient driving ion Antiport - solute moves in opposite direct to the gradient driving ion	Symport or antiport protein and energy	Suga aci	rs, amino ds, ions
YES - ATP		Endocytosis	Towards the interior of the cell	Vesicle formation and energy	Bulk transport of macromolecules	
YES - ATP		Exocytosis	Towards the exterior of the cell	Fusion of vesicle with the plasma membrane and energy	Bulk transport of macromolecules	