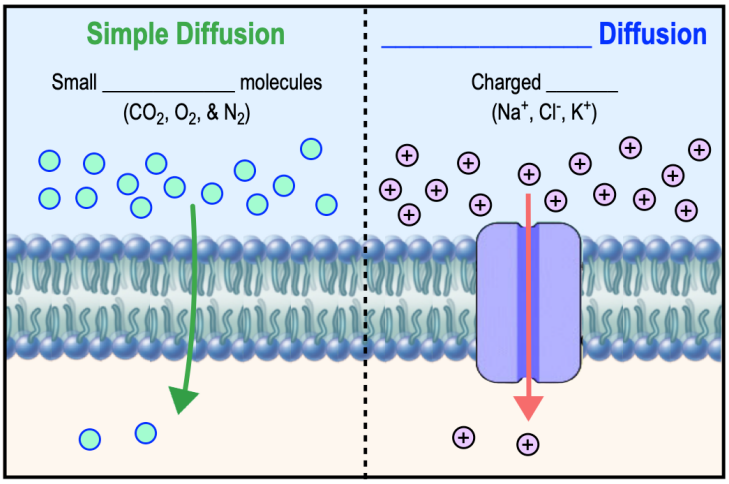
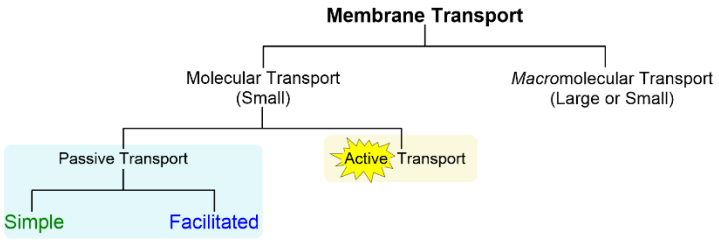
CONCEPT: PASSIVE MEMBRANE TRANSPORT

Simple & Facilitated Passive Transport

- _____ types of *passive transport*:
  1) _____ *Diffusion*: simple & direct diffusion through the membrane (squeezing between phospholipids).
  2) *Facilitated Diffusion*: non-energetic diffusion that is _____ by a membrane-*protein*.

EXAMPLE: Passive Transport: Simple vs. Facilitated Diffusion.





PRACTICE: The difference between simple and facilitated diffusion is that facilitated diffusion:

a) Requires a protein transporter.
b) Moves molecules against their concentration gradient.
c) Requires energy.
d) Freely diffuses molecules against their concentration gradient.

PRACTICE: Simple diffusion and facilitated diffusion across a membrane both _____:

a) Move molecules against their concentration gradient.
b) Move molecules with their concentration gradient.
c) Require ATP.
d) Use a protein transporter.
e) Transport charged molecules from low to high concentration.
f) Transport large, charged molecules from high to low concentration.
g) Both b and f are true.

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Kinetics of Passive Transport

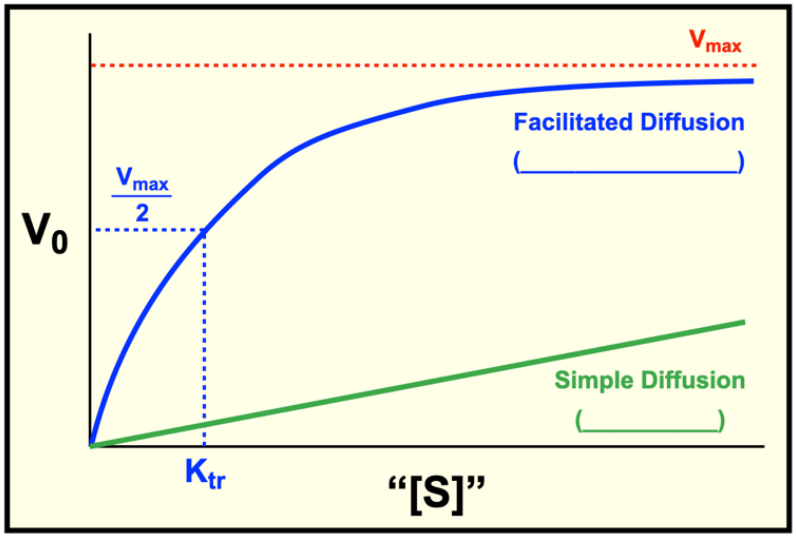
●*Rate/velocity* of passive transport: driven by the extent of the *concentration gradient* across the membrane.

□ The *greater* the concentration, the *faster* the *rate* of _____ *diffusion* (forms _____ data).

●Rate of _____ diffusion is even *faster*; HOWEVER, its *limited* by the amount of transport protein.

□ Therefore, passive *facilitated* diffusion rates form a _____, *Michaelis-Menten* curve.

□ K_{tr}: "substrate" concentration at which the **tr**ansport-protein is _____-saturated (analogous to the K_m).



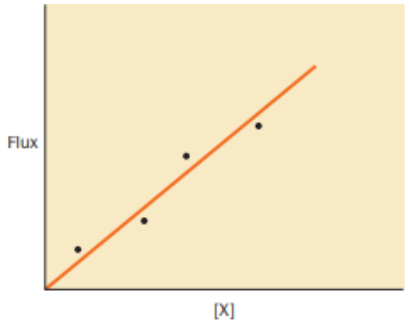
$$V_0 = \frac{V_{max}[S]}{K_{tr} + [S]}$$

$$y = mx + b$$

PRACTICE: The rate of movement (flux) of a substance X into cells was measured at different concentrations of X to construct the following graph. Does the graph's data suggest diffusion of X into cells is mediated by a protein transporter?

a) Yes, diffusion of X is mediated by a protein transporter (facilitated diffusion).

b) No, diffusion of X is not mediated by a protein transporter (simple diffusion).



PRACTICE: The rate of transfer across a membrane is measured for a given molecule. The diffusion rate is seen to be hyperbolic with respect to the concentration of the diffusing molecule. The method of transport is which of the following?

a) Facilitated diffusion.

b) Active transport.

c) Simple Diffusion.

d) Symporter diffusion.