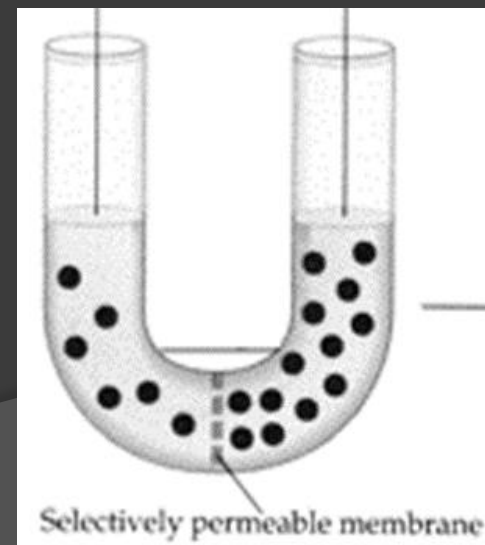


Warm-up:

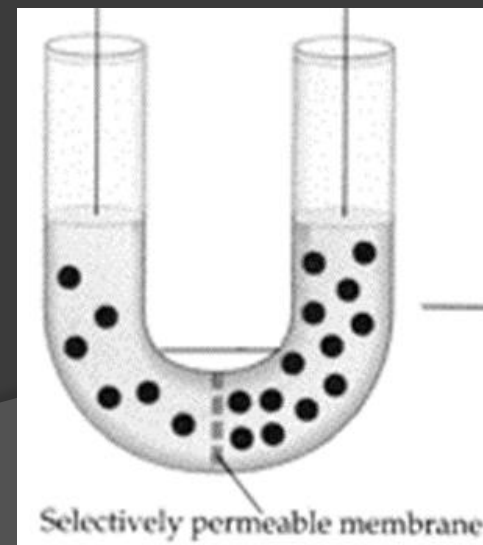
1. Diffusion moves substances from _____ to _____ concentration.
2. Diffusion moves _____ a concentration gradient.
3. The U-shaped tube in the figure below is divided by a membrane that is impermeable to starch but permeable to water. In what direction will water move?



Warm-up:

1. Diffusion moves substances from HIGH to LOW concentration.
2. Diffusion moves ALONG/DOWN/WITH a concentration gradient.
3. The U-shaped tube in the figure below is divided by a membrane that is impermeable to starch but permeable to water. In what direction will water move?

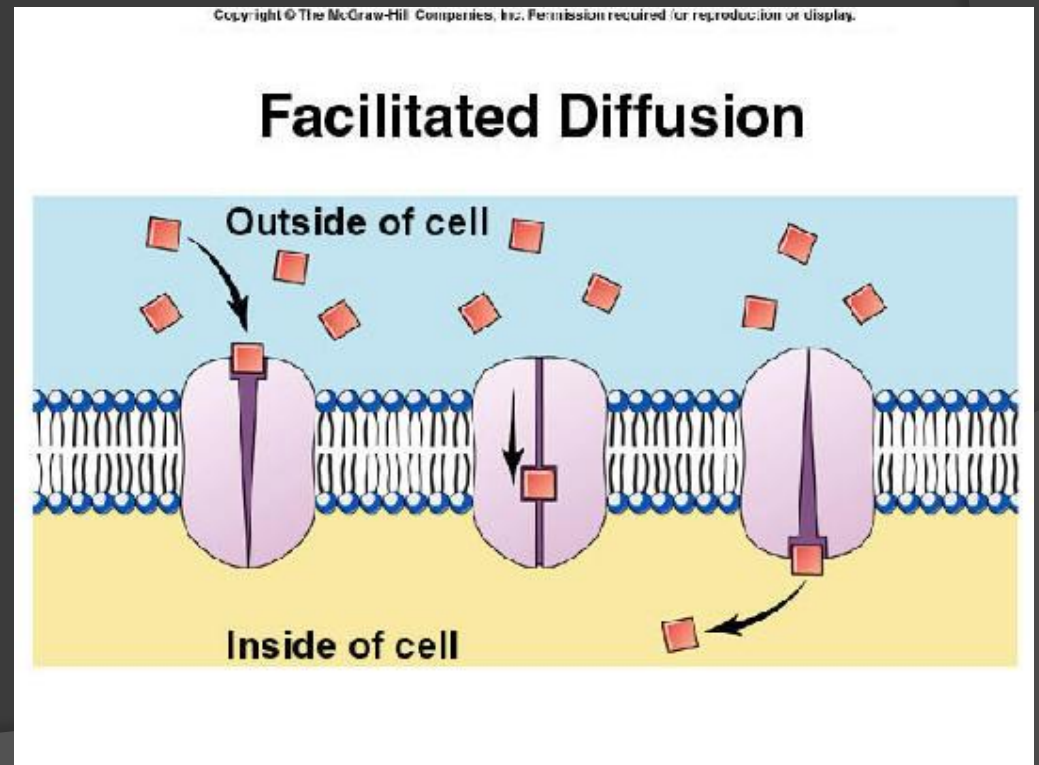
From left to right



Special Types of Transport

Facilitated Diffusion

- Movement of specific molecules across membranes through protein channels
- Fast and specific



Facilitated Diffusion

- Still Diffusion – must be a HIGH to LOW concentration gradient
- Does NOT require energy
 - E.g. Red Blood Cells have a special glucose protein channel that allows glucose to easily pass through the membrane

Active Transport

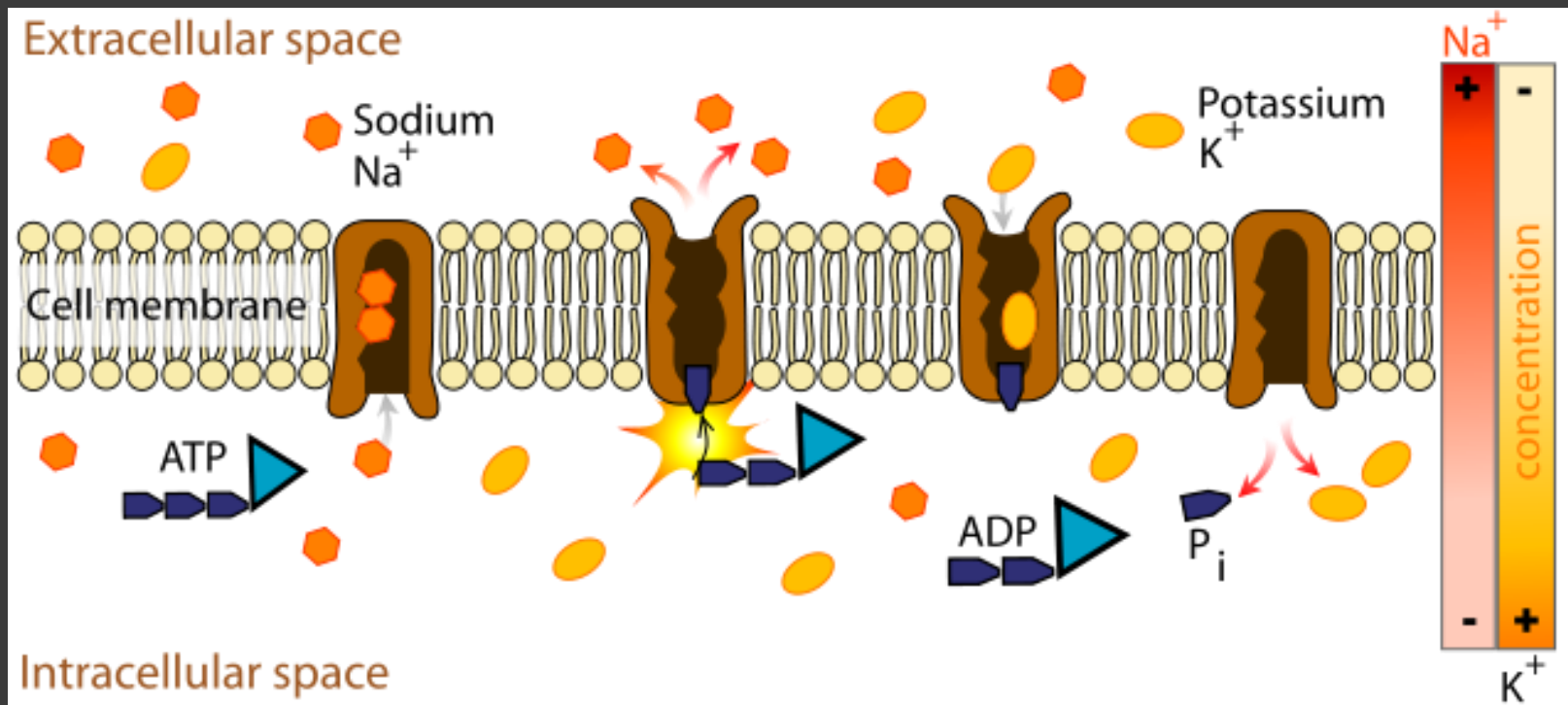
- Substances moving AGAINST the concentration gradient
 - i.e. from LOW to HIGH concentration
 - **REQUIRES ENERGY!!!!**

Active Transport

- Occurs by two mechanisms:
 1. Transport proteins or pumps
 - Small molecules or ions
 2. Endocytosis/Exocytosis
 - Large molecules or clumps

Active Transport by Protein Pumps

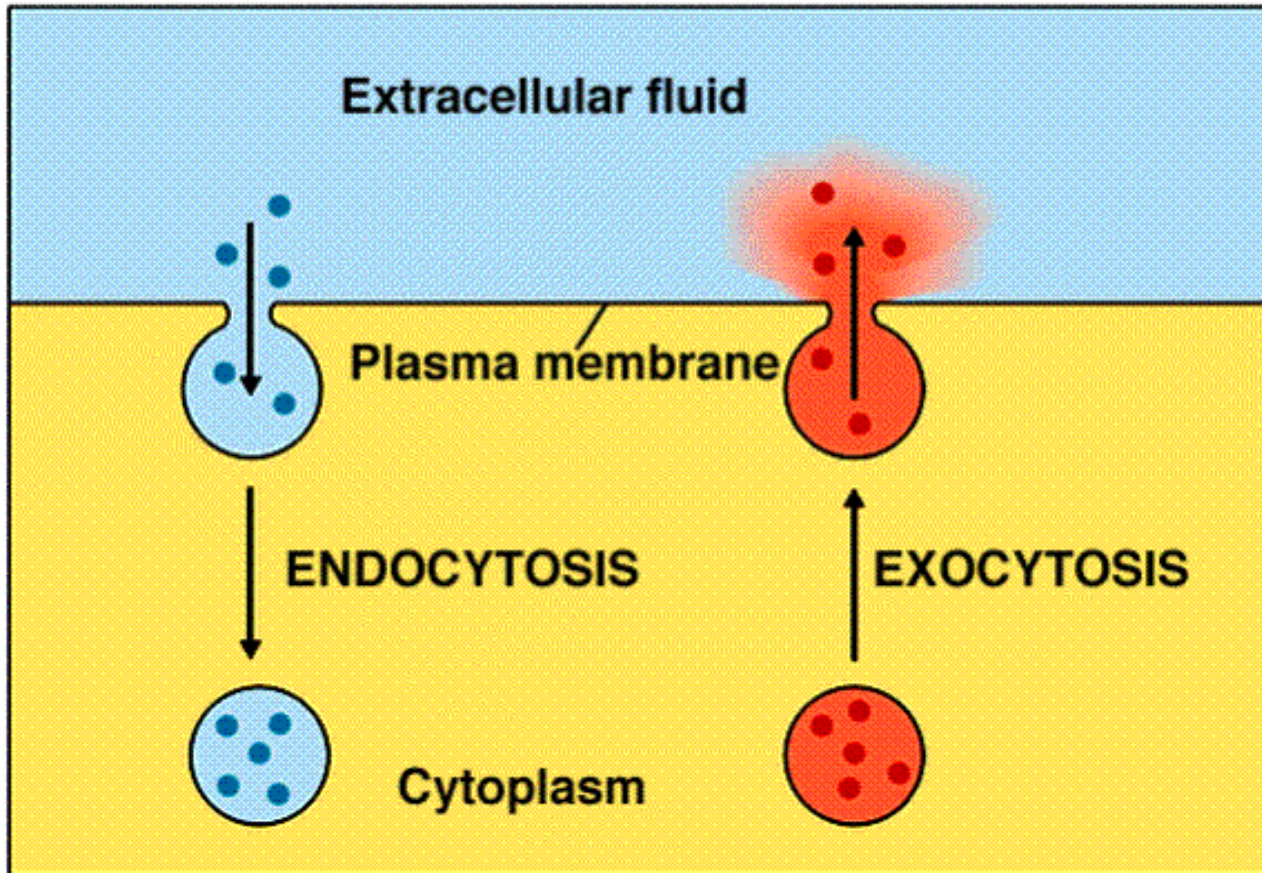
⦿ E.g. Sodium-Potassium Pump



Active Transport by Endo/Exocytosis

- ⊙ Endocytosis – taking material into the cell by pockets of membrane
 - E.g.
 - Phagocytosis
 - Pinocytosis
- ⊙ Exocytosis – process by which cell release large material
 - E.g.
 - Removal of water by contractile vacuole

Endocytosis and Exocytosis



- <https://concord.org/stem-resources/diffusion-osmosis-and-active-transport>

Describe the type of transport represented by each molecule

