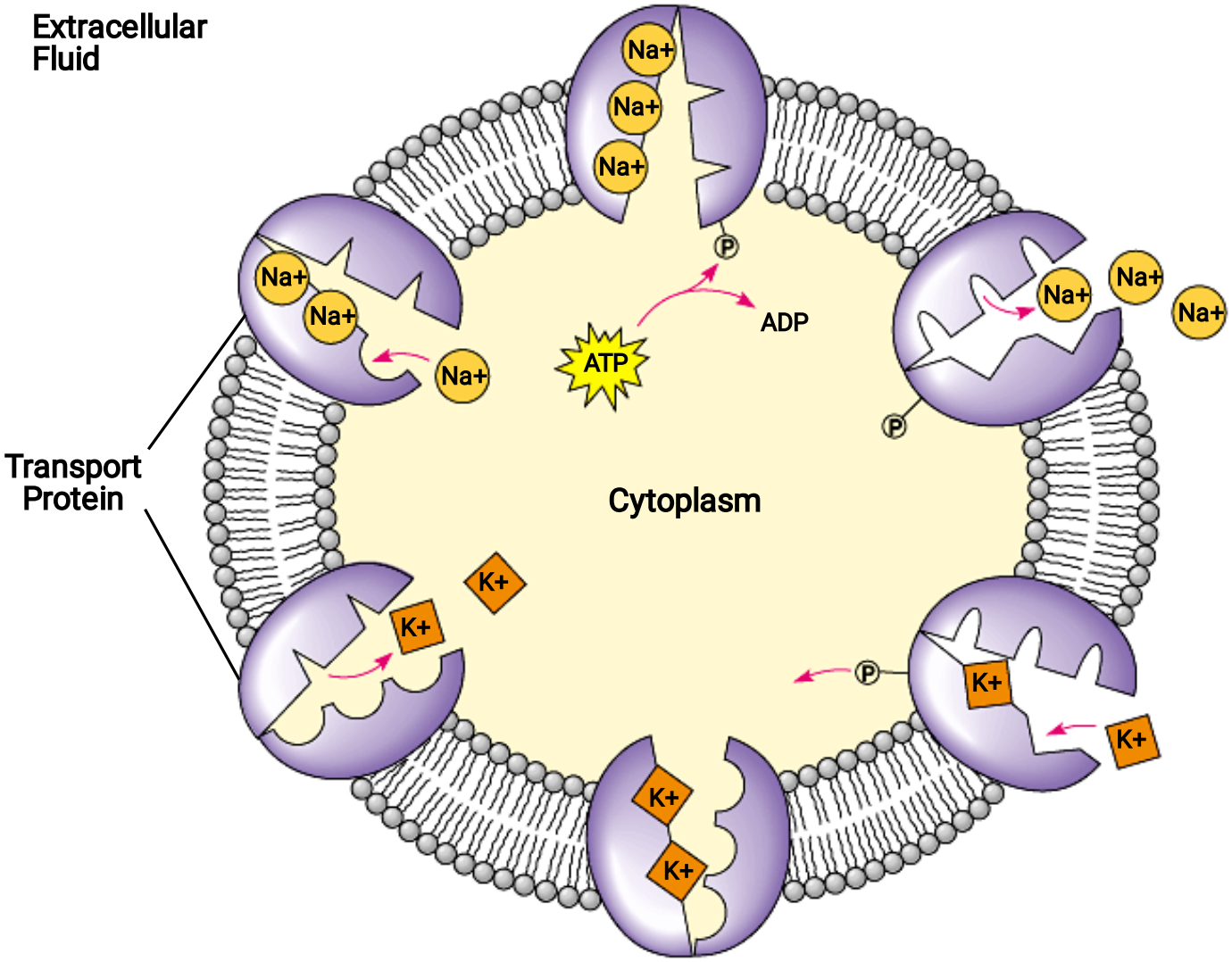
(p.148) **20.** *Describe* **active transport.** What type of transport proteins are involved, and what is the role of ATP in the process?

Active transport is the pumping of molecules across a membrane against it concentration gradient. Specific integral proteins embedded in the membrane are involved with this process. This transport is "uphill" and therefore requires energy in the form of ATP.

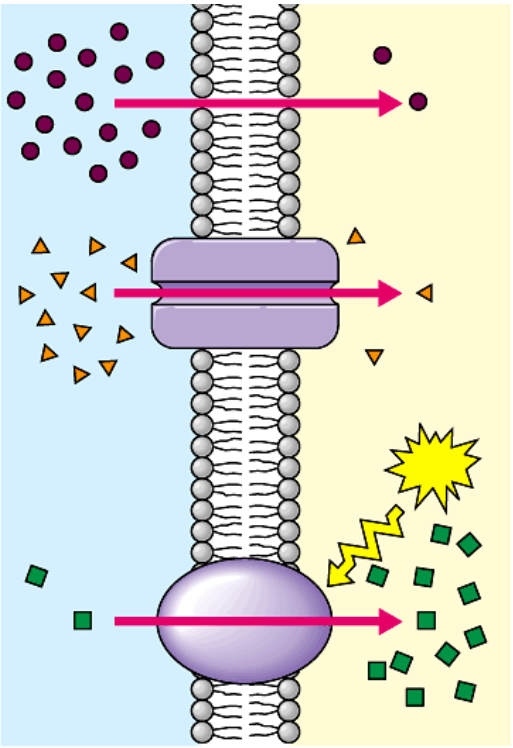
(p.149) **21.** The **sodium-potassium pump** is an important system for you to know and will come in to play when we study the human nervous system. *Label* and use the diagram below to understand how it works. Be sure to *summarize* each step and to label each of the following in the diagram: extracellular fluid, cytoplasm, Na+, K+, ATP, ADP, P, transport protein. *(Figure 8.15)*

(Ricochet Science: Sodium-Potassium Pump)



This transport system pumps ions against steep concentration gradients. The pump oscillates between two conformational states in a pumping cycle that translocate THREE Na+ ions OUT of the cell for every TWO K+ ions pumped INTO the cell. ATP is the source of energy.

(p.150) **22.** On the diagram below, add these labels: **facilitated diffusion** with a carrier protein, facilitated diffusion with a channel protein, active transport with a carrier protein, simple diffusion. For each type of transport, state an example of a material that is moved in this manner.



Simple Diffusion of OXYGEN

Facilitated Diffusion of WATER

(Aquaporins)

Active Transport of H^+ions with a proton pump

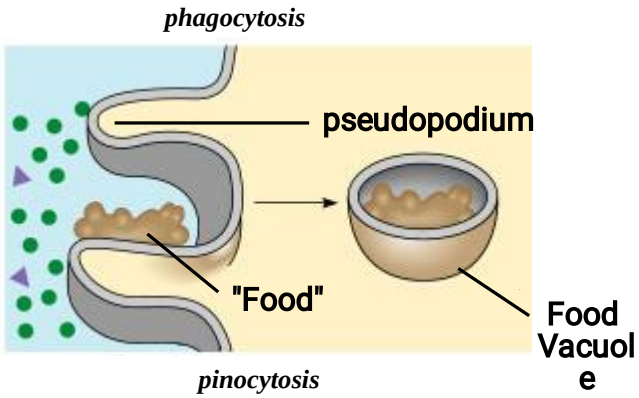
(p.151) **23.** *Contrast* between **ENDOcytosis** and **EXOcytosis**?

Endocytosis is the TAKING IN of macromolecules INTO a cell and exocytosis is the secretion of macromolecules FROM the cell.

(p.152) **24.** *Label* the diagram to the right and use it to help *explain* the process of **phagocytosis**.

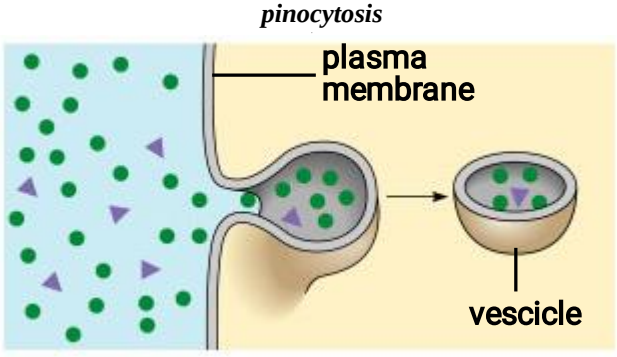
Phagocytosis occurs when a pseudopodium engulf a particle and package it in a vacuole.

Phagocytosis Video



(p.152) **25.** *Label* the diagram to the right and use it to help *explain* the process of **pinocytosis**.

Pinocytosis occurs when droplets of extracellular fluid are into a cell in small vescicles.



(Overview of Cell Transport)