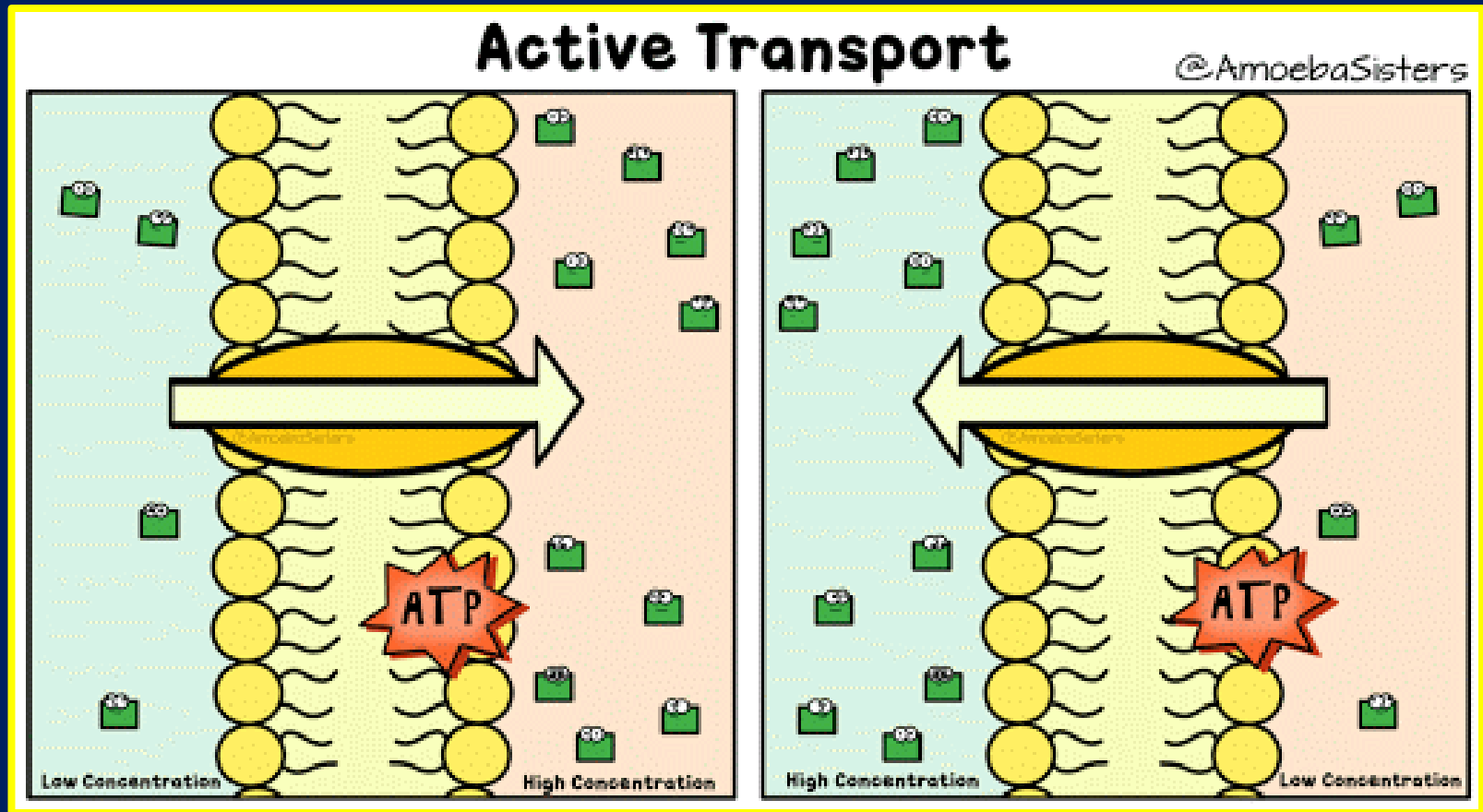
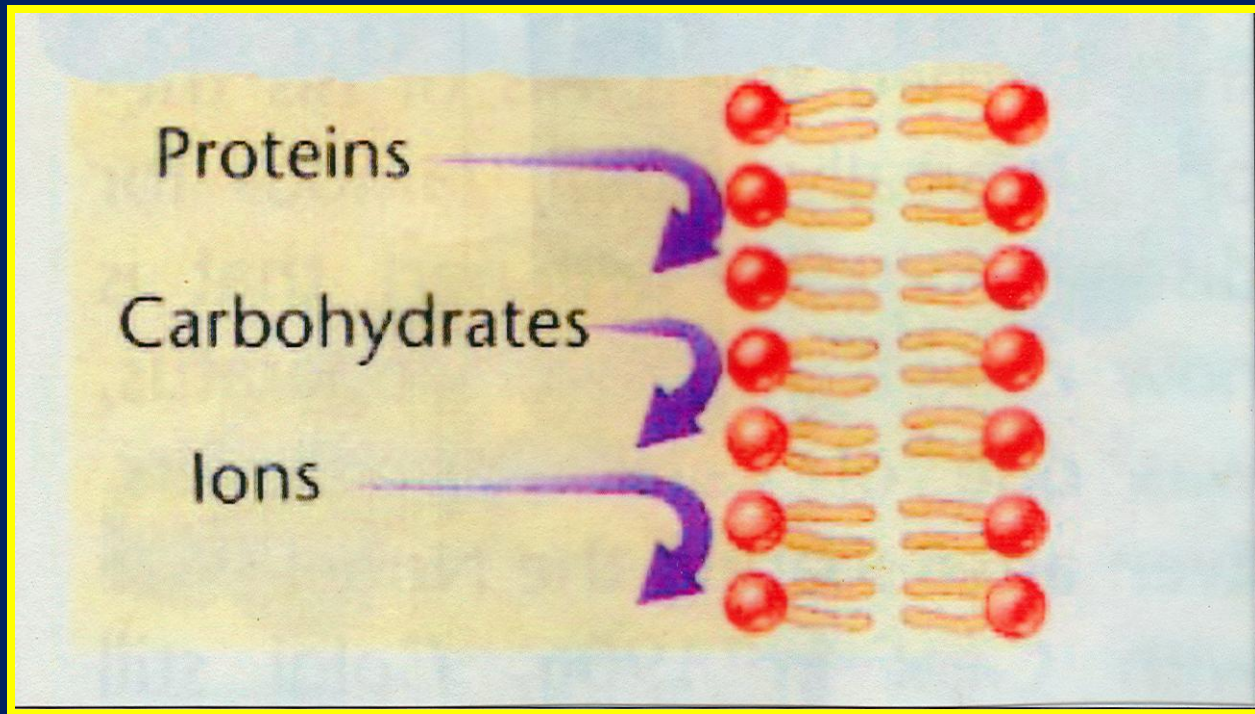


# Active Transport



Active Transport is when molecules cannot pass easily through the cell membrane and energy is required

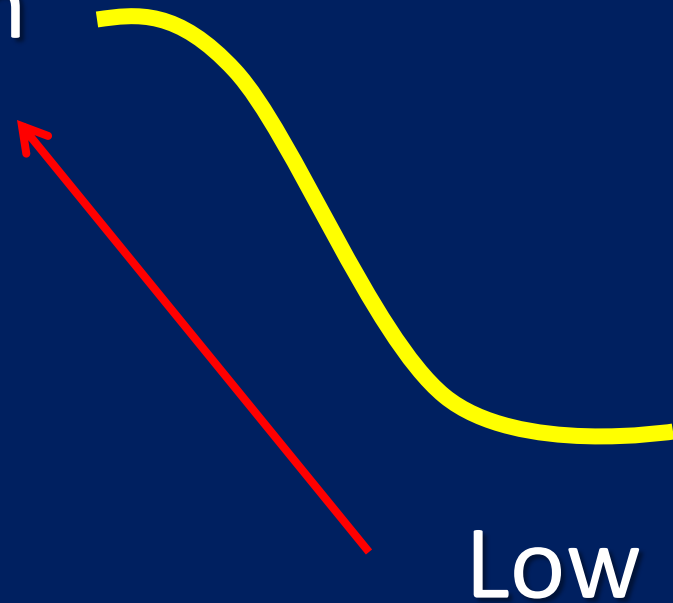


Large molecules and charged ions use this process

During active transport, molecules move from areas of low concentration to areas of high concentration



High



Low

**Requires Energy**

# There are two types of Active Transport Mechanisms

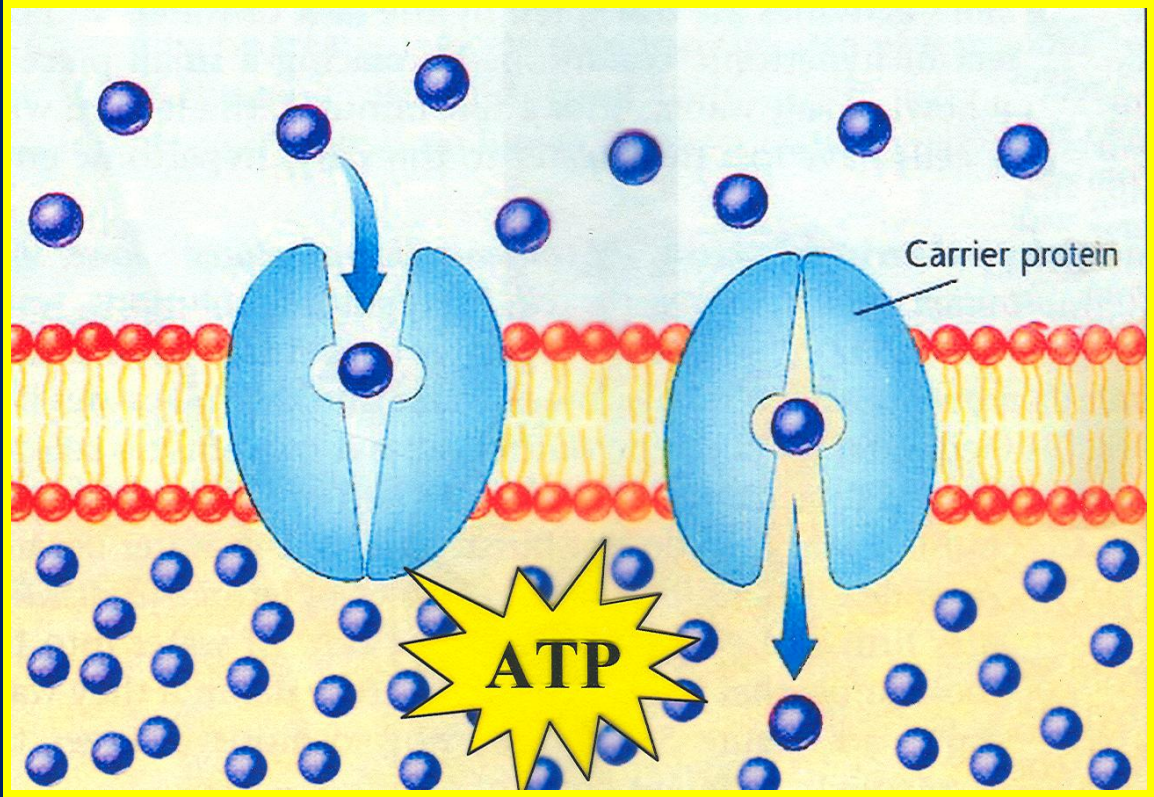
1. Ion Pumps
2. Bulk Transport

# Carrier proteins carry molecules across the cell membrane with the use of ATP energy

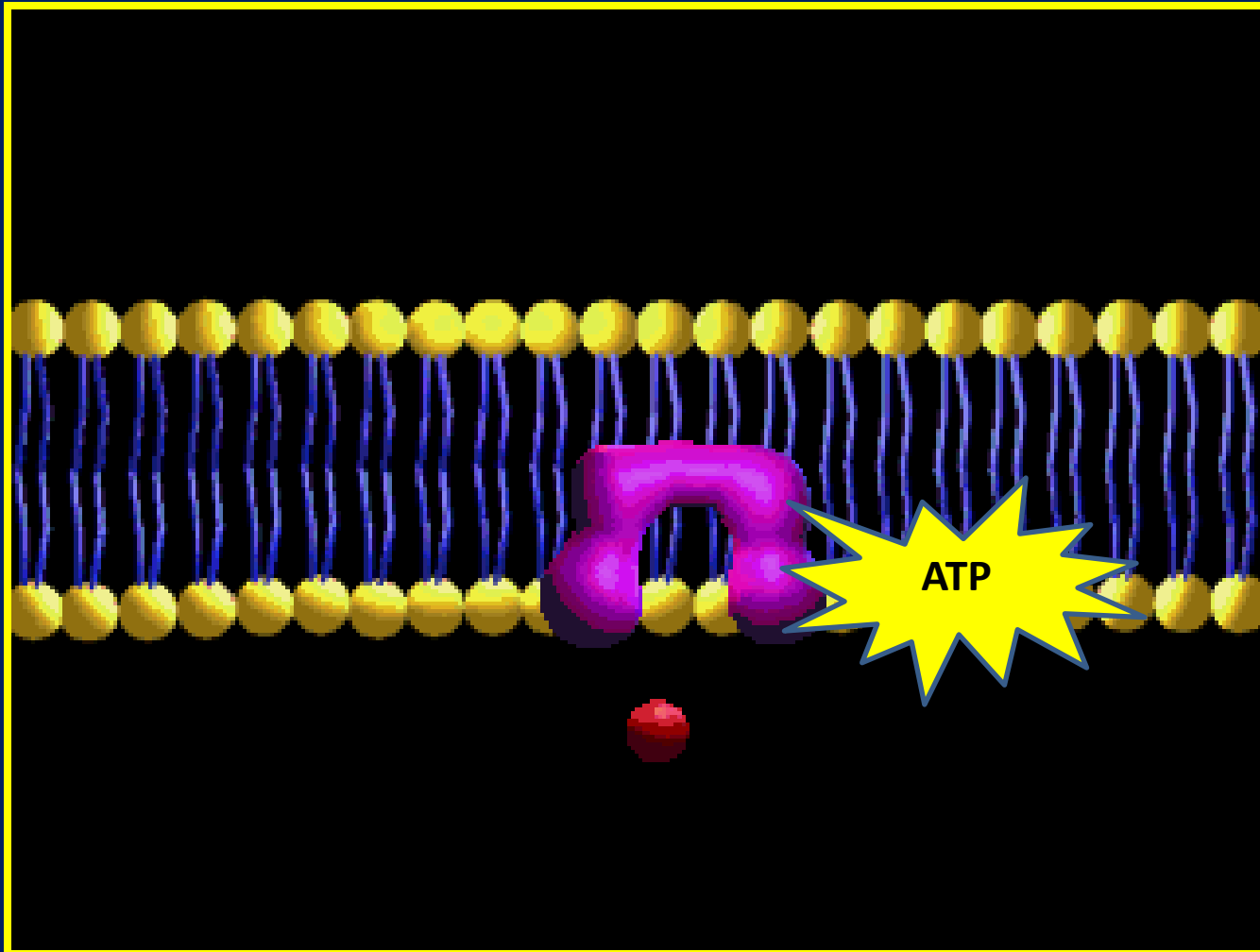
High



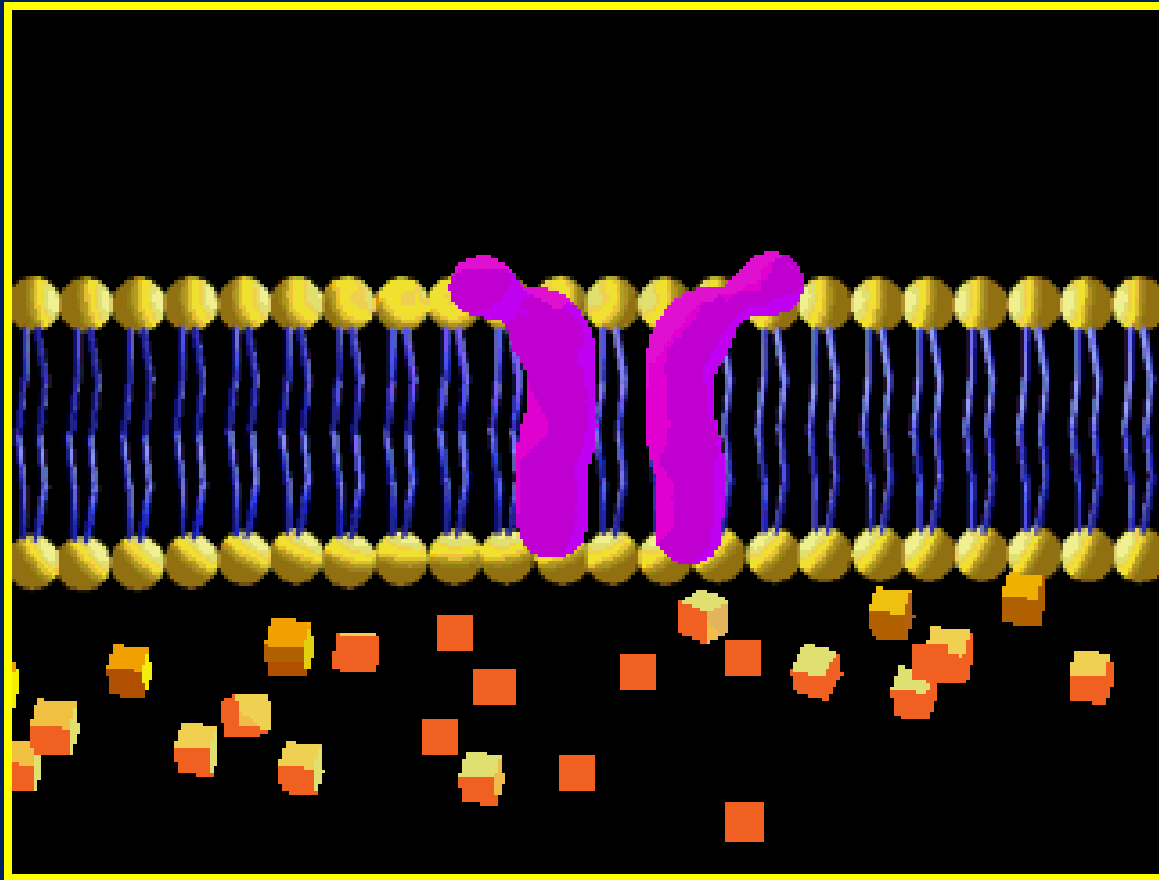
Low



The ATP energy molecules help the protein change shape, once the molecule is inside the protein



# Facilitated Diffusion (passive)

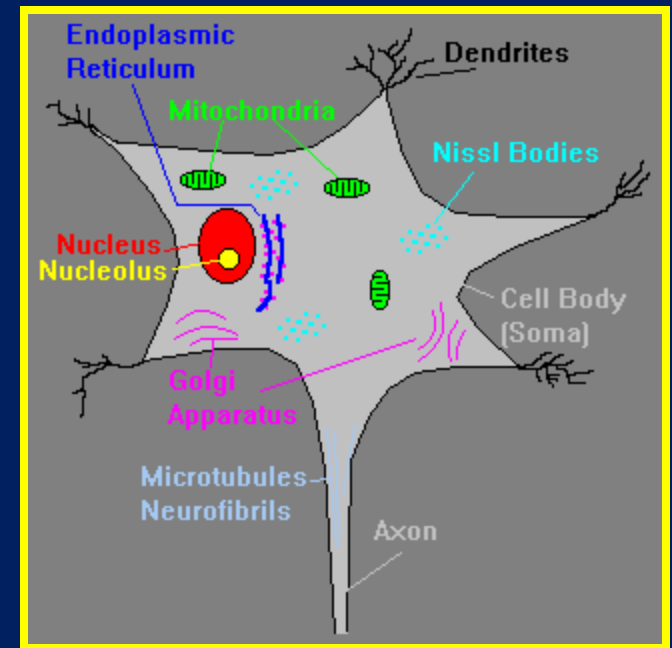


Protein does not change shape as molecules move from high to low concentrations

# Nerve Cells - Neurons

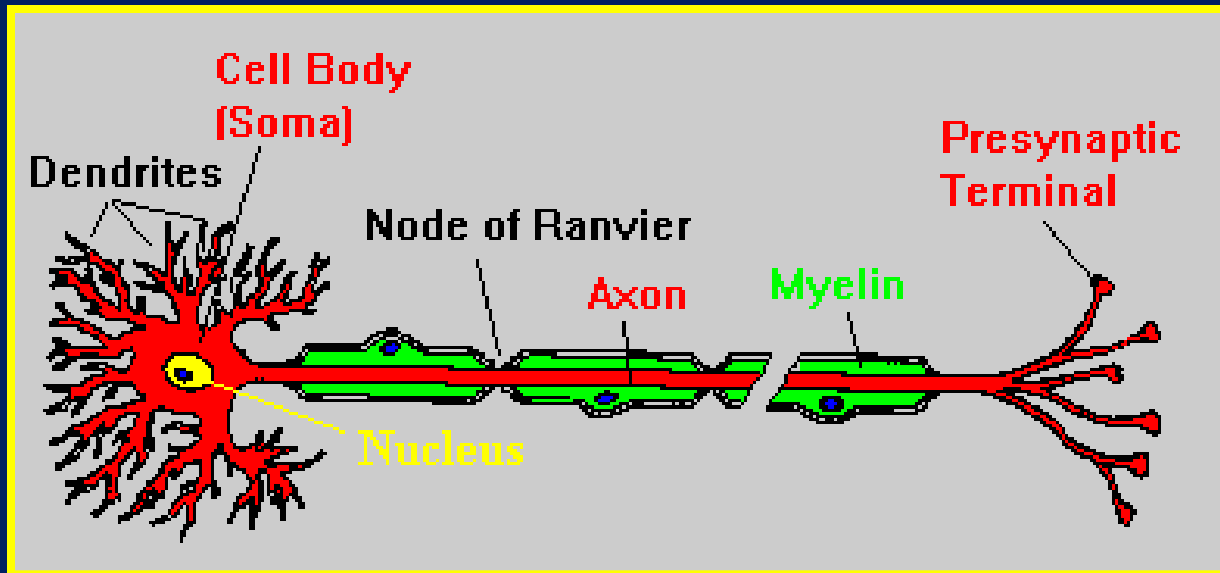
Cells of the nervous system, called neurons, are specialized to carry “messages” through an electrochemical process.

Neurons are similar to other cells in that they have a cell membrane, nucleus, ribosomes, and other organelles.



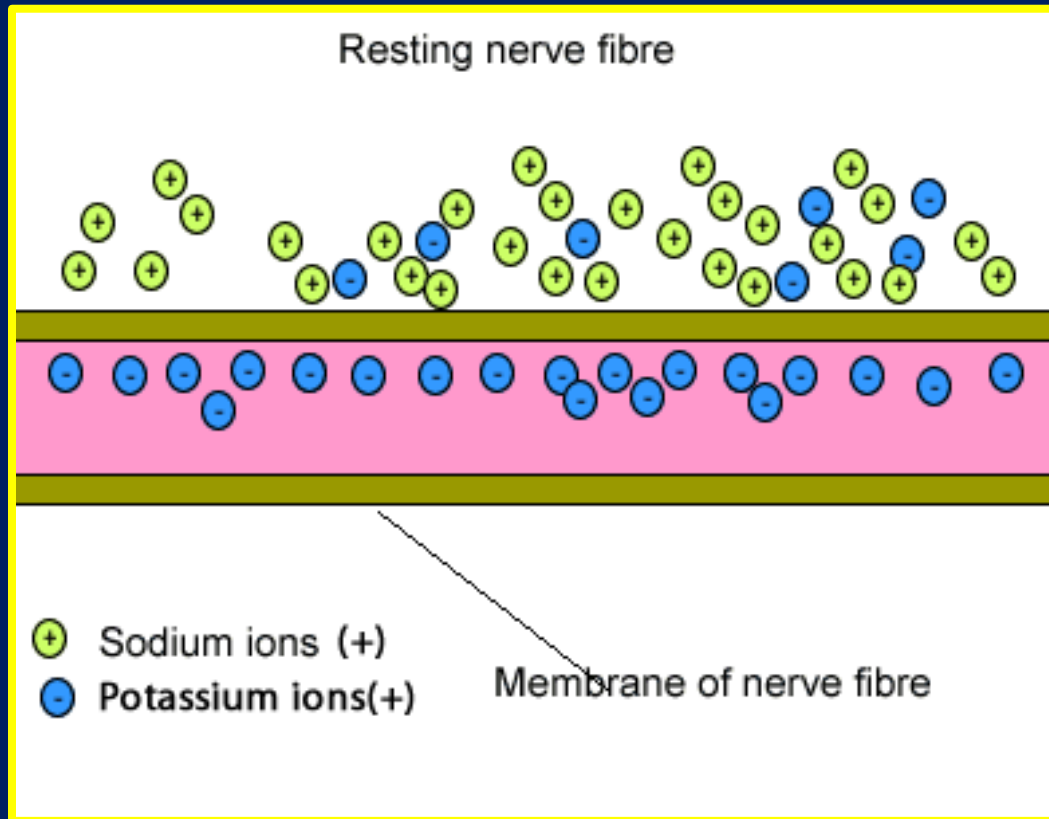


Neurons are different in that they have specialized cell parts called dendrites and axons.



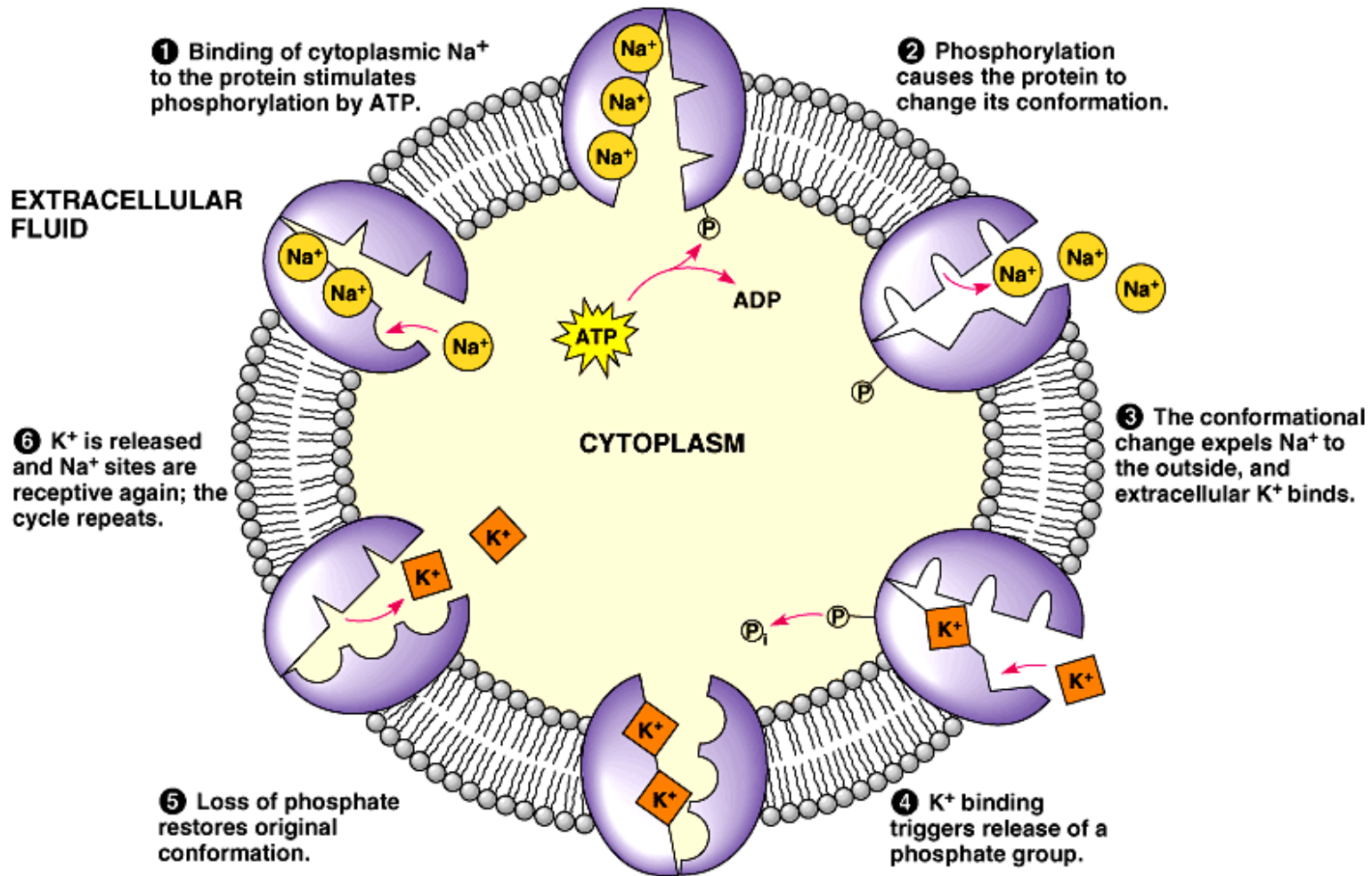
The dendrites bring electrical signals to the cell body and the axons take electrical information away from the cell body.

Electrical signals are moved down the neuron by the movement of sodium and potassium ions into and out of the cell, changing the electrical charge around the membrane.



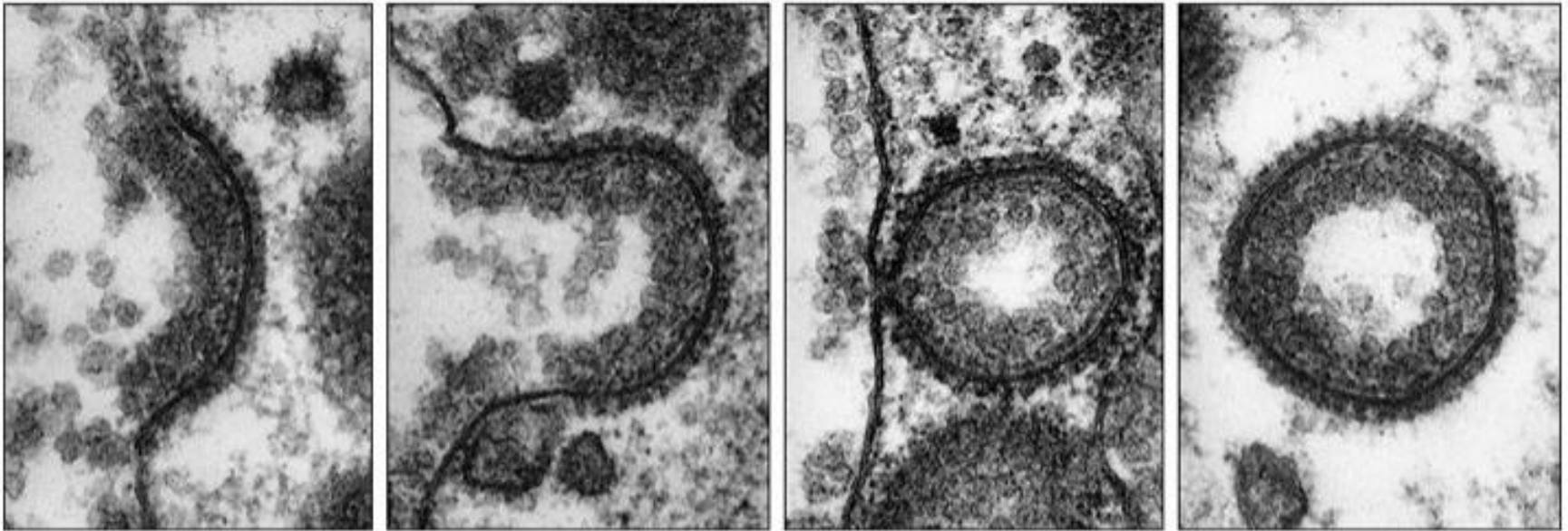
# Sodium-Potassium Pump

[http://highered.mcgraw-hill.com/sites/9834092339/student\\_view0/chapter44/sodium-potassium\\_exchange\\_pump.html](http://highered.mcgraw-hill.com/sites/9834092339/student_view0/chapter44/sodium-potassium_exchange_pump.html)



# Bulk Transport

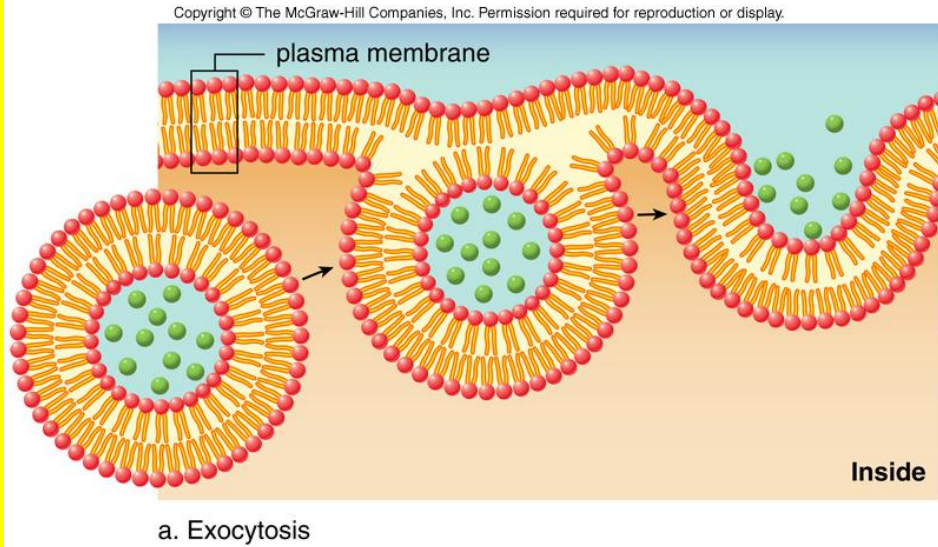
Large materials move in or out of cells through vesicles that fuse with the cell membrane in a process called bulk transport



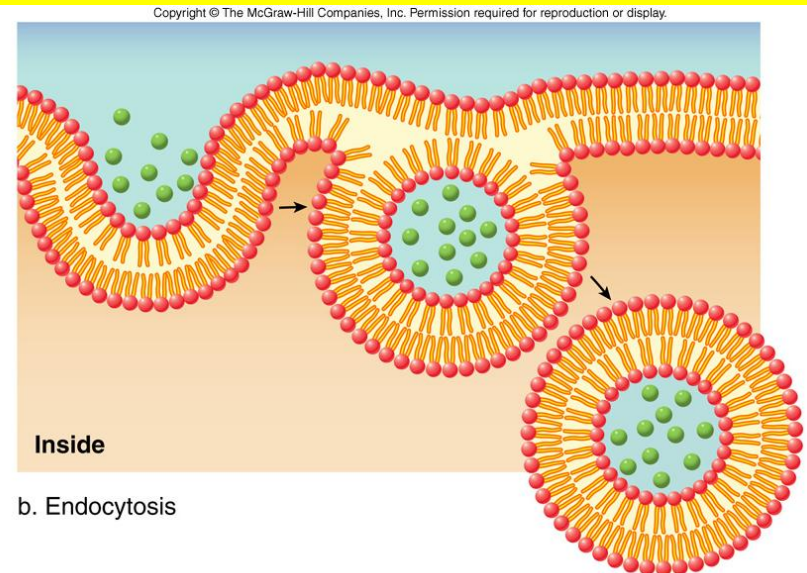
Energy is Required

# Bulk Transport

Exocytosis is when materials are moved out of the cell



Endocytosis is when materials are moved into the cell



# Review

