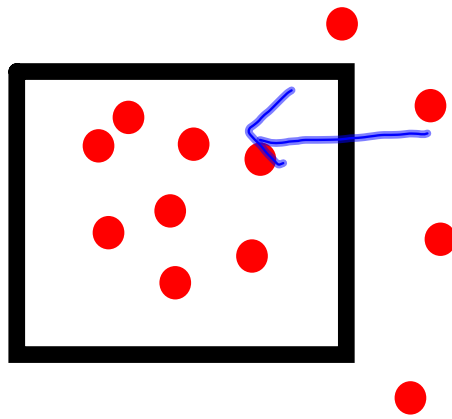


# Chapter 4-2

Sometimes things need to be transported into the cell which might be against the concentration gradient.



active  
transport

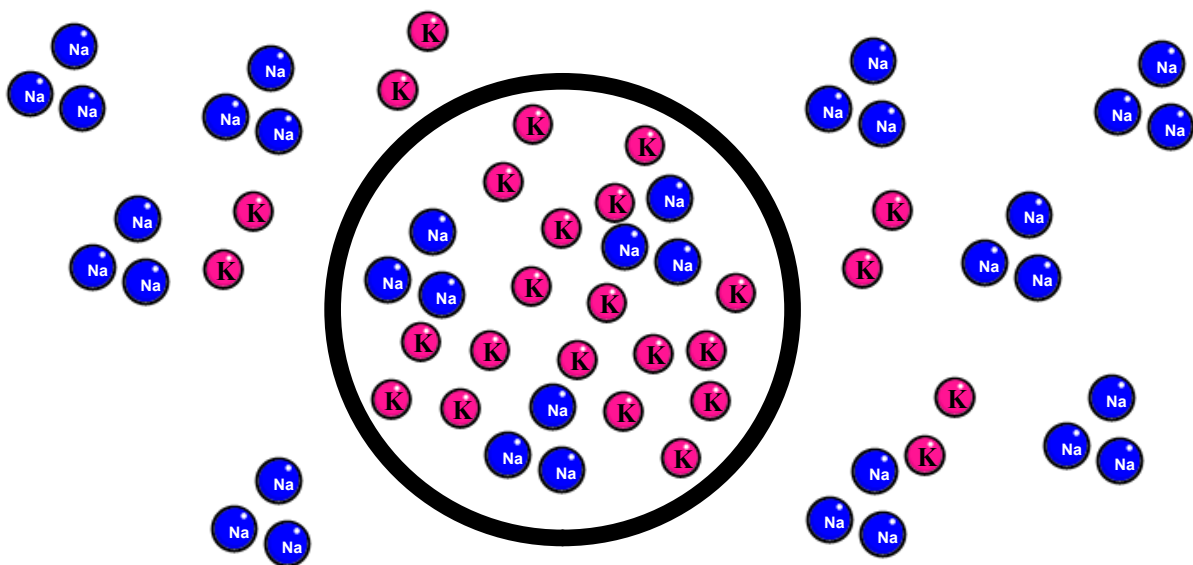
**Transporting against  
the concentration  
gradient is called**

Active  
transport.

**This requires  
the cell to  
Use ATP  
(energy)**



## Sodium-Potassium Pump



**The sodium-potassium pump does two things:**

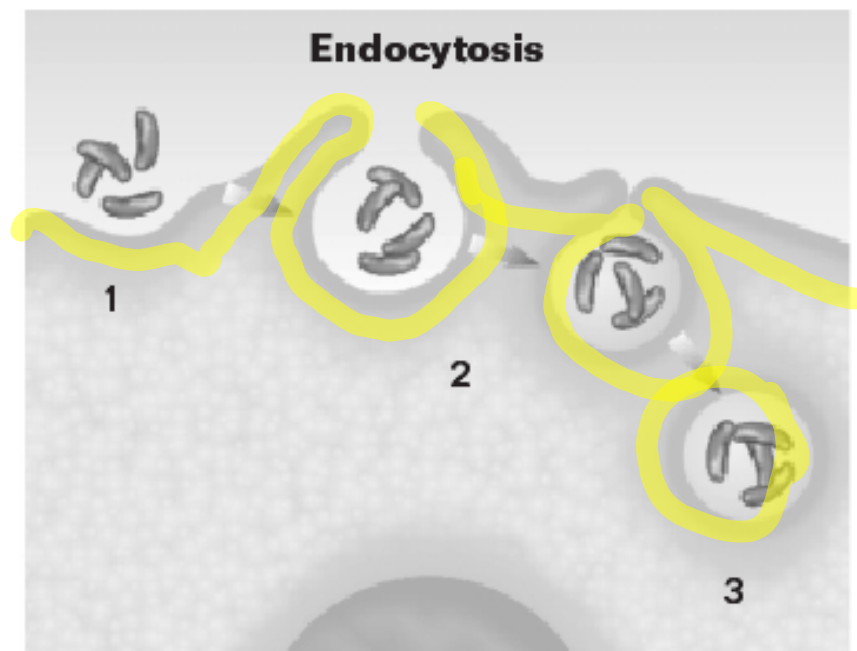
**1. Prevents sodium from accumulating inside the cell. Sodium diffuses into the cell.**

**2. Maintains the sodium and potassium gradients.**

**Many substances are too large to be transported by Carrier protein.**

**Endocytosis-**  
**movement of a**  
Substance**into a**  
**cell by a vesicle.**

endo = in

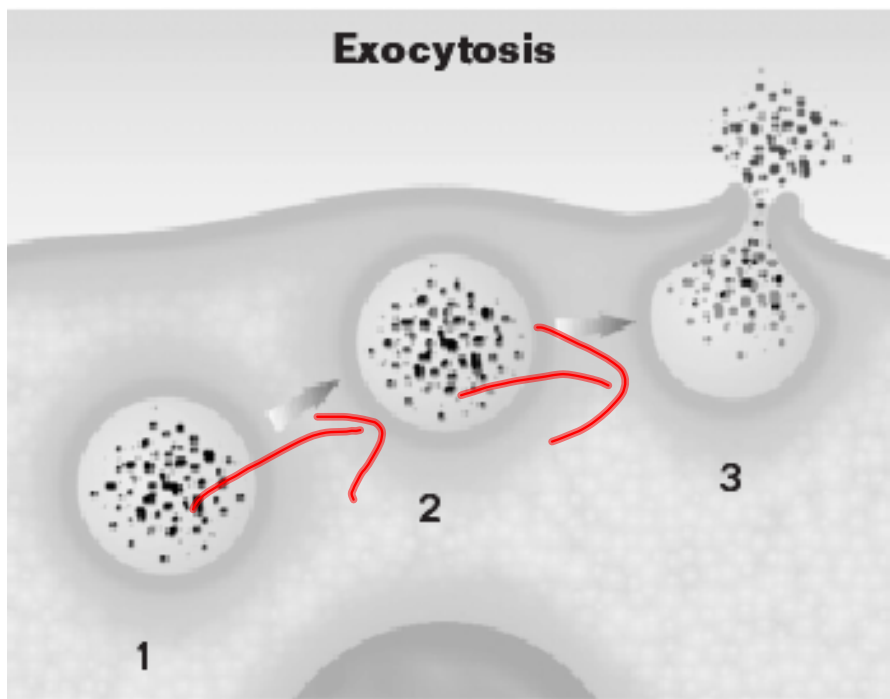


**BIO SOURCES**  
**TRANSPARENCY MASTER**



**Exocytosis-**  
movement  
**of a substance**  
**by a vesicle to**  
**the outside of**  
**a cell**

exo = ex i/



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**TRANSPARENCY MASTER**

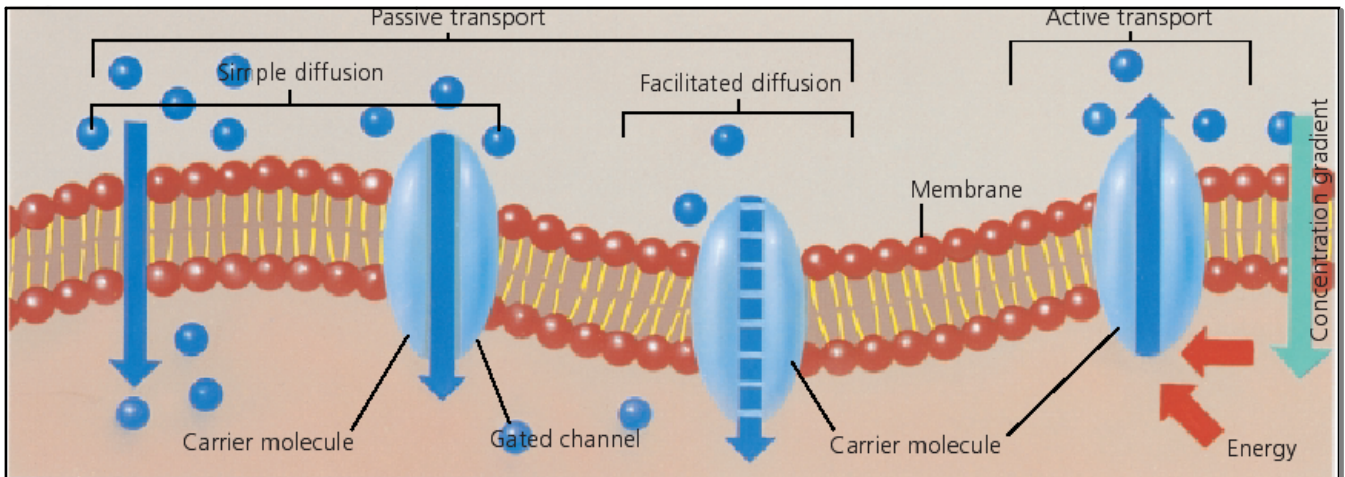
## Receptor proteins do three things

1. Can change permiability making an ion channel stay open.

door  
stop

**2. It can make second  
messengers that act as a  
signal protein in the  
cytoplasm.**

**3. It can  
activate  
enzymes in cells  
or trigger  
other chemical  
reactions.**



**BIO SOURCES**  
TEACHING TRANSPARENCIES

Video

