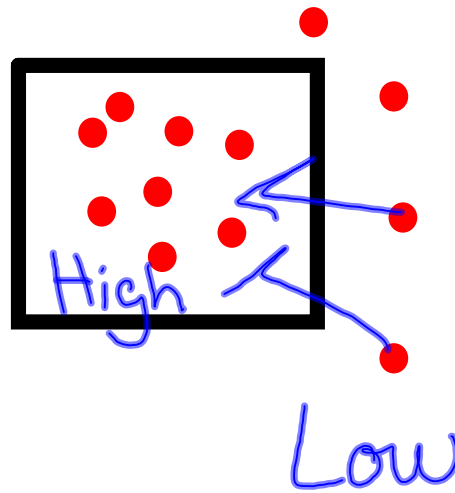


Sometimes things need to be transported into the cell which might be against the concentration gradient.



Transporting against the concentration gradient is called

active transport

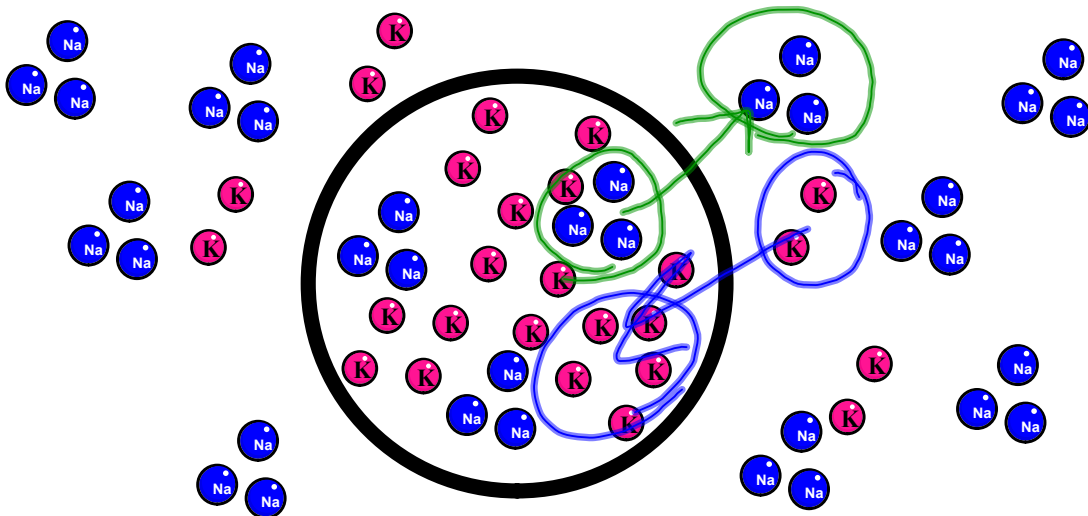
like moving a couch

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.**

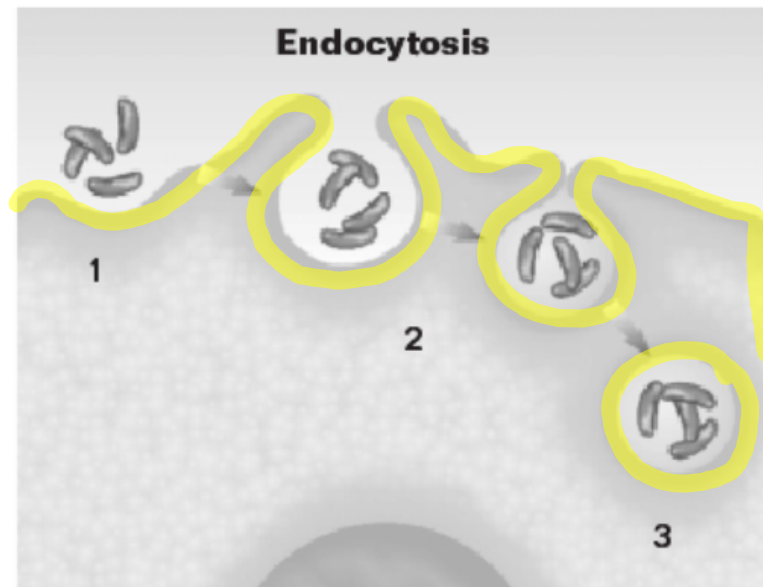
**2. Maintains the sodium and**

**potassium gradients.**

**Many substances are too large to be transported by carrier proteins.**

dog → dog door  
person → door

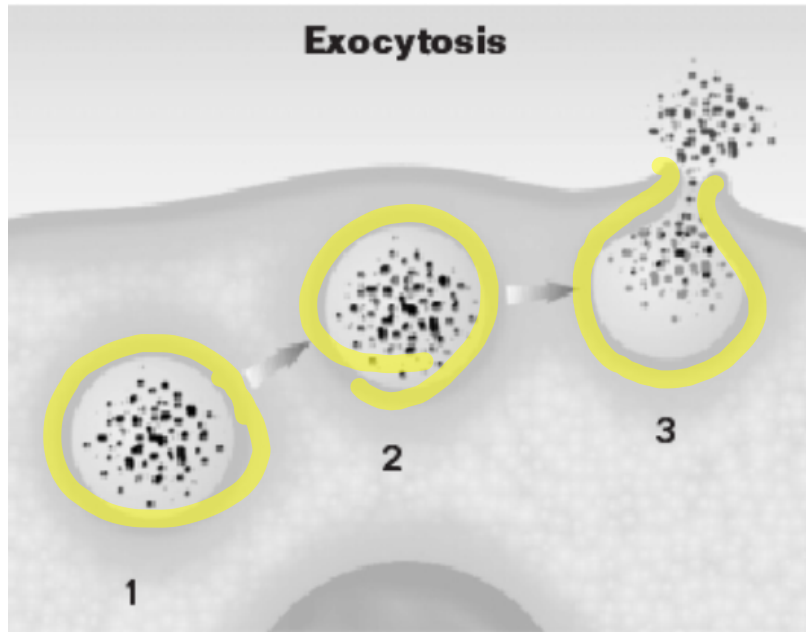
**Endocytosis-  
movement of a  
Substance into a  
cell by a vesicle.**



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

exit

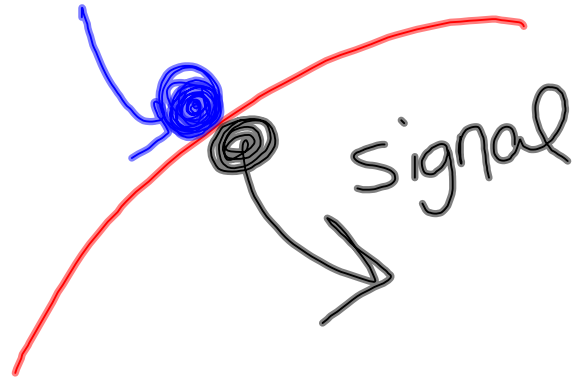


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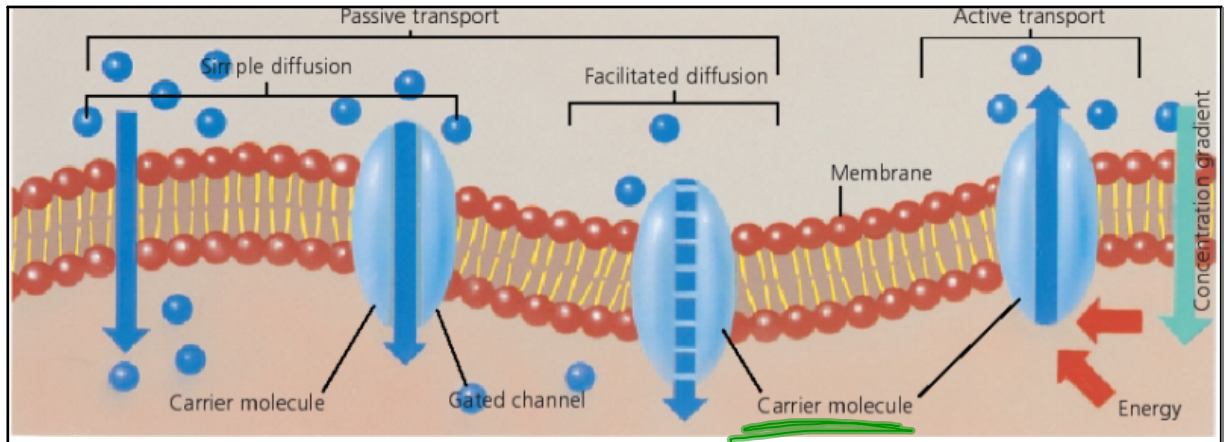
**Receptor  
proteins do  
three things**

**1. Can change**  
permeability  
**making an ion  
channel stay  
open.**

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



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



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Ch Vocab  
may use  
your textbook