Ch 7.4

**Active Transport**: Transporting things in and out of a cell by using energy

* Uses energy to move solutes against gradient
* Goes to where its more concentrated
* Is nonspontaneous and is always carrier proteins

*Active Transport* is generally **unfavorable** because of it need for energy

Active Transport help cell maintain a different level of concentration than its environment

* EX: Environment has **Many Sodium Ions** / **Very Few Potassium Ions** in comparison to cell
  + Cell maintains concentrations using **Sodium-Potassium Pump**
    - Exchanges **3**Na+ for **2**K+
    - ATP Hydrolysis provides energy
    - Creates concentration gradient to facilitate the diffusion of the cations across the membrane

Membrane Potential: The voltage across a membrane

* Note: Voltage = Electrical Potential Energy / A separation of opposite charges
* Neg charge on cytoplasmic side because anions unequal distribution

Electrochemical Gradient: Combined forced acting on an ion

* Creates concentration gradient to facilitate the diffusion of the cations across the membrane

Electrogenic Pump: Generates voltage across the membrane

* Proton pump is another example

Concentration difference created

Diffusion down can be used to power another less favorable reaction