        - Isotonic- don't take in or release (cell stays the same)
        - Hypotonic- low inside cell to high outside cell (cell swells up against cell wall)
- **Cytoplasmic Membrane and Energy Transformation**
    - Electron transport chain embedded in membrane
        - Critical role in converting energy into ATP
    - Use energy from electrons to move protons out of cell
- Transportation of small molecules
    - Most pass through proteins as selective gates
        - Termed transport systems
    - Facilitated diffusion-- a form of passive (passive because no ATP required) transport that involves a **carrier**
    - Active transport-- requires energy
        - Movement against the gradient
            - Two main mechanisms: proton motive force & ATP
    - Group Translocation
        - Chemically altered compound (changing a chemical to make the cell think it is not in there
        - Common technique is phosphorylation
    - **Bulk Transport--**
        - Endocytosis: take materials in using invaginations
            - Pinocytosis-- bring fluid into cell by wrapping around it and dragging in
            - Receptor mediated = same thing just specialized
            - Exocytosis is reverse of endocytosis
                - Plants, bacteria, and fungi cannot do endocytosis because of cell wall
- **Cell wall**
    - Strong rigid structure that prevents cell lysis
    - Design of it distinguishes between two main groups of bacteria
        - Gpositive (has peptidoglycan)
        - Gnegative (lacks as much peptidoglycan)
            - Second membrane called the outer membrane
    - Peptidoglycan: sugar and protein parts
        - N-acetylmuramic acid (NAM)
        - N-acetylglucosamine (NAG)
        - Print out powerpoint for this chapter
        - Lipo teichoic acids go through the peptidoglycan go through cell wall and link into the membrane to help anchor it down
    - Penicillin -- does not effect gram negative cells because cannot reach peptidoglycan due o outer membrane
    - Shock caused by endotoxins can be made worse by antibiotics because once the bacteria are killed they only release more endotoxins
    - Lysozyme: in every single secretion that we emit--breaks bonds in glycan chain
- Some bacteria lack cell walls
    - Mycoplasma species have extremely variable shape
    - Strengthen cell membrane by using sterols
    - Must live within the body
- Cell walls in Archaea
    - Have variety of cell walls
    - No peptidoglycan in cell wall