

- Catabolism: breakdown of a molecule into smaller components
- Anabolism: Synthesis of cellular molecules and macromolecules

Typical Bacteria Cell

- Plasma membrane: barrier
- Cytoplasm: Contained inside plasma membrane
- Nucleoid: region where genetic material found
- Ribosomes: involved in protein synthesis, in chromosomes in nucleus

Outside Plasma Membrane

- Cell Wall: Support and protect
- Glycocalyx: "sugar coat", traps water, protection, attachment
- Appendages: Pilli (attachment), flagella (locomotion)

Translation

- Information within a gene is ultimately translated into the sequence of amino acids
- Process of polypeptide synthesis in Ribosomes
- Transfer RNA (tRNA): Brings amino acids
- Messenger RNA (mRNA): Information to make a polypeptide

Cytoskeleton

- Network of 3 different types of protein filaments:
 1. Microtubules: dynamic and unstable, organizing center for animals
 2. Intermediate Filaments: Most stable, readily polymerize and depolymerize
 3. Actin Filaments: Provide structure and mobility for cell

Motor Proteins

- Head, hinge, tail

- Fluid-Mosaic Model: membrane is considered a mosaic of lipid, protein, and carbohydrate molecules, membrane exhibits properties that resemble a fluid because lipids and proteins can move relative to each other within the membrane

Proteins Bound to Membranes

- Integral Membrane Proteins
 - Transmembrane proteins: one or more regions that are physically embedded in the hydrophobic region of the phospholipid bilayer
 - Lipid Anchors: Covalent attachment of a lipid to an amino acid side chain within a protein
- Peripheral Membrane Proteins
 - Non covalently bound to region of integral membrane proteins that project out from the membrane, or they are bound to the polar head groups of phospholipids

Membranes are Semifluid

- Fluidity: Individual molecules remain close, yet have ability to move
- Semifluid: most lipids can rotate freely around axis within leaflet
- “Flip Flop” of Lipids: from one leaflet to opposite leaflet. Requires ATP to transport lipid from one leaflet to another
 - Flipase: out to in
 - Flopase: in to out
 - Scramblases: both, out to in, in to out

- Factors that affect fluidity:

1. Length of fatty acyl tails
2. Presence of double bonds in the acyl tails
3. Presence of Cholesterol

Glycosylation

- Process of covalently attaching a carbohydrate to a protein or a lipid