

Biological Macromolecules

Molecules of Life

- Small organic compounds are subunits for the synthesis of larger molecules (See Fig.4, p. 100 for models of the macromolecules)

<u>Macromolecule</u>	<u>Subunit</u>
Complex carbohydrates	Simple sugars
Lipids	Glycerol and fatty acids
Proteins	Amino acids
Nucleic acids	Nucleotides

Chemical Reactions

- Are responsible for assembling and disassembling macromolecules
- Anabolic reactions involve the construction of larger molecules
- Catabolic reactions involve the breakdown of macromolecules into subunits (ex/ nutrient breakdown during digestion)
- Many reactions involve either hydrolysis or condensation, where a linkage is created or destroyed
- Condensation or dehydration synthesis: two molecules combine through covalent bonding, producing water (requires energy)
- See Fig. 5 on p. 28
- Starch and other polymers are assembled in this manner
- Hydrolysis: the covalent bond of a molecule breaks, a water molecule separates into H and OH and attaches to the exposed sites
- Starch and other polymers are broken down this way

Rates of Chemical Reactions

- Heat speeds up a reaction (increase of KE, kinetic energy), by causing more collisions
- Adding a catalyst causes the rate of a reaction to proceed very quickly
- A catalyst is a substance that alters the rate of a chemical reaction without being altered in the process
- Enzymes are biological catalysts that are produced by living systems to control the rates of reactions
- They recognize the covalent bond to be created or broken