Biomolecules

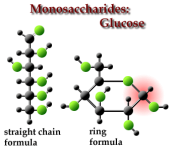
any organic molecule that is produced by a living organism

Carbohydrates

- Function as our main source of energy
- Serve as structural purposes

Made of carbon, hydrogen and oxygen in a 1:2:1 ratio (think of glucose, $C_6H_{12}O_6$)

Basic unit or monomer is the **monosaccharide**



Glucose is a simple sugar (monomer).

Polymers of carbohydrates are called **polysaccharides**. Examples are:

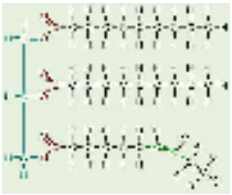
Starch- food storage for plants
Glycogen- food storage for animals
Cellulose- forms cell walls of plants
Chitin- forms exoskeletons of insects, and crustaceans

Lipids

- Insoluble in water
- Serve as a long term energy source (get more energy from breakdown of fats than you do from carbohydrates)
- Major component of cell membranes
- Function as insulation and protection (waxes and oils)
- Serve as chemical messengers (hormones such as steroids)

- Composed of many carbons and hydrogens and a few oxygens

<u>Basic unit</u> is a glycerol molecule and 3 fatty acids



biology.clc.uc.edu/graphics/bio104/fat.jpg

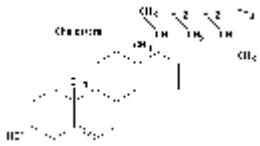
What is the difference between saturated and unsaturated fats?

saturated fats have all single bonds between carbon atoms (C – C)

unsaturated fats have one or more double bonded carbons **(C=C)**

Examples of lipids

- Olive oil, canola oil from plants (liquid)
- Earwax
- Fat from animals (solid)
- Testosterone, estrogen and cholesterol

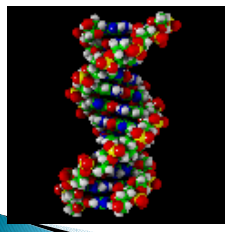


Nucleic Acids

- Function to store and transmit genetic information
- Involved in protein synthesis

Basic unit is a nucleotide. Each nucleotide is composed of a five carbon sugar, a phosphate group and a nitrogen base.

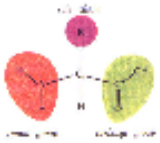
- A polymer of nucleic acids would be DNA (deoxyribonucleic acid) and RNA (ribonucleic acid). They are a series of nucleotides strung together.



Proteins

- Used to form body tissues such as muscle, bones, and organs.
- Transport substances such as oxygen and iron
- Help fight disease (antibodies)
- Control the rate of reactions (enzymes)
- Used as poisons or toxins

The monomer of a protein is an amino acid.



Many amino acids joined together form polypeptides. The amino acids are joined together by **peptide bonds.** Several polypeptides join to form a protein such as hemoglobin.