

Biochemistry Chapter 4 Note Sheet

There are FOUR different categories of Biochemical Compounds.

1. CARBOHYDRATES these compounds are composed of CARBON, HYDROGEN and OXYGEN. They are a combination of CARBON & WATER.

They are used in the body for ENERGY.

Examples of these compounds are:

GLUCOSE, SUCROSE (Table Sugar), BREAD, PASTA, CELLULOSE(Most Common) and CHITIN(shells of arthropods)

They can be organized into three groups:

1. **MONOSACCHARIDES – SINGLE RINGED SUGARS Ex. GLUCOSE and FRUCTOSE**

2. **DISACCHARIDES – TWO RINGED SUGARS Ex. SUCROSE**

3. **POLYSACCHARIDES – MANY RINGED SUGARS Ex. STARCH**

Small molecules are combined to form larger molecules by a process called DEHYDRATION SYNTHESIS by the removal of WATER.

Large molecules are broken down to smaller molecules by a process called HYDROLYSIS by the addition of WATER.

Both these processes require ENZYMES to take place.

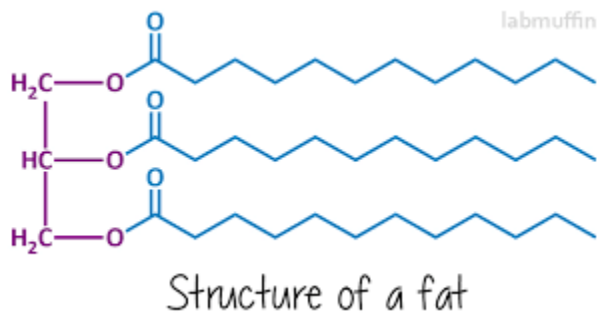
2. LIPIDS / FATS these compounds are composed of CARBON , HYDROGEN and OXYGEN . They are used in the body for ENERGY STORAGE & PROTECTION .

Examples of these compounds are:

FATS, OIL and WAX

A basic fat molecule is composed of one GLYCEROL molecule and three FATTY ACID molecules. These are referred to as triglycerides.

A fat molecule looks like:



They can be organized into two groups:

1. SATURATED where the molecule contain all the hydrogen atoms that it can hold.

2. UNSATURATED where some of the hydrogen atoms are missing.

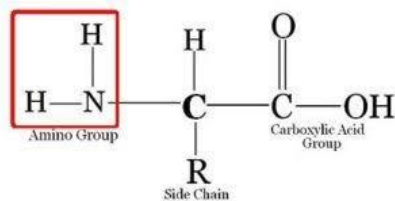
UNSATURATED fats are consider to be better for you to eat since they aren't absorbed by your body.

Fats are digested in your blood by CHOLESTEROL . Too much FAT and CHOLESTEROL can buildup in the walls of an artery forming a plaque that may lead to a heart attack or stroke.

3. PROTEINS these compounds are composed of CARBON, HYDROGEN, OXYGEN AND NITROGEN.

The building block of proteins are AMINO ACIDS.

The chemical structure of an A.A. is:



Proteins are used in the body for STRUCTURE & CHEMICAL CONTROL.

Examples of these compounds are:

SKIN, MUSCLES, HAIR and HORMONES

****The most important type of proteins are ENZYMES ****

ENZYMES control all the chemical reaction in your body.

Proteins can be organized into two groups:

1. **DIPEPTIDES – TWO AMINO ACIDS BONDED TOGETHER**

2. **POLYPEPTIDES – THREE OR MORE AMINO ACIDS BONDED TOGETHER**

The shape of a protein is very important to their function. If the shape is changed or DENATURED they will no longer work.

An example of this is:

**FRYING AN EGG - THE EGG WHITES GO FROM A CLEAR LIQUID TO A WHITE SOLID.
EGG WHITES ARE MADE OF PROTEIN.**

4. NUCLEIC ACIDS are very important molecules composed of C, H, O, N, P, S.

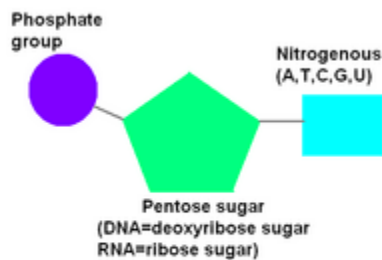
These molecules make up the structure of RNA & DNA.

DNA is for the storage of genetic information.

RNA is for the transfer of genetic information.

The basic building block of nucleic acids are NUCLEOTIDES

They look like:



There are five different NITROGENOUS BASES

The different nitrogenous bases are:

In DNA A ADENINE

T THYMINE

C CYTOSINE

G GUANINE

A always connects with T

C always connects with G

In RNA A ADENINE

U URACIL

C CYTOSINE

G GUANINE

A always connects with U

C always connects with G

The shape of DNA is a DOUBLE HELIX

The shape of RNA is a SINGLE STRAND

Nucleic Acids will be covered more in your Reproduction and Development class.