

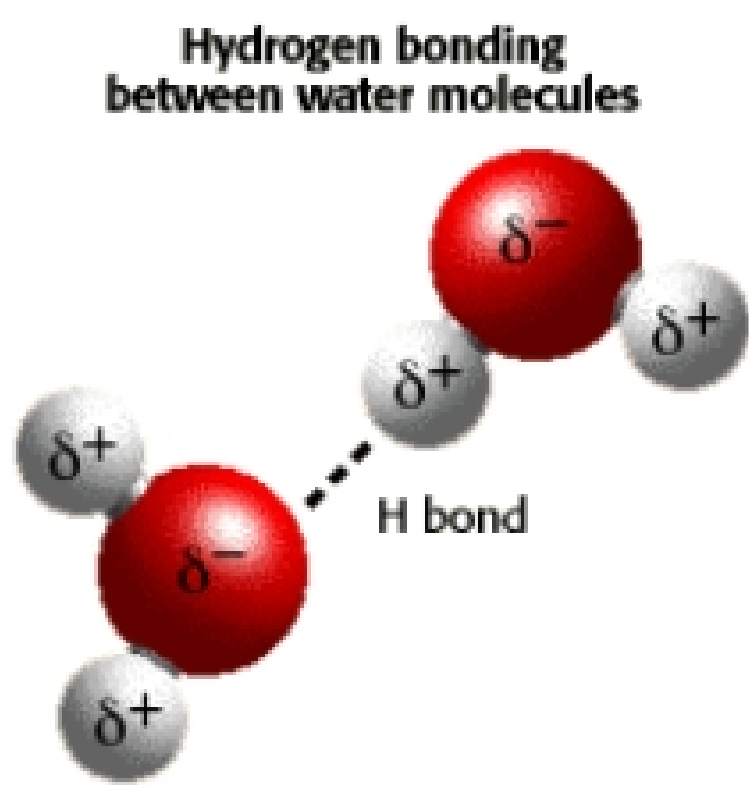
Lecture 1: 08/21/06

Introduction to Biochemistry and Cellular Components

Biochemistry is the study of the chemistry of biological systems

1. Water Molecules (H₂O)

- a. A "polar" molecule
- b. A partial negative charge (δ^-) near the oxygen atom and partial positive charges (δ^+) near the hydrogen atoms.
- c. Hydrophilic (water loving)
- d. Hydrophobic (does not like water)



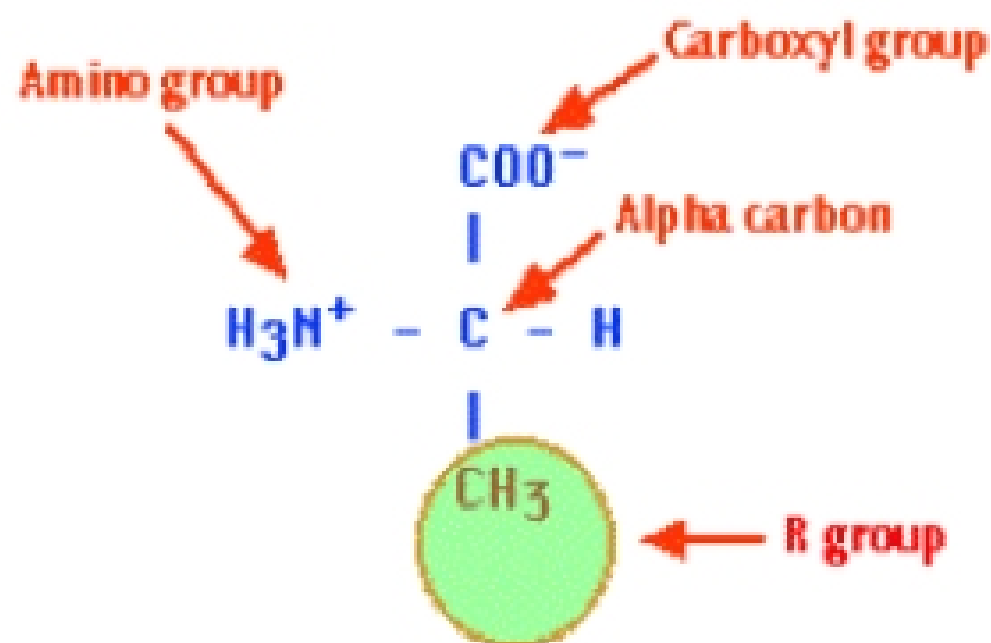
Ref:

<http://www.biology.arizona.edu/biochemistry/tutorials/chemistry/page3.html>

2. Proteins

- a. 20 different amino acids are used to synthesize proteins.
- b. Each amino acid consists of an alpha carbon atom to which is attached
 - i. a hydrogen atom
 - ii. an amino group
 - iii. a carboxyl group (-COOH). This gives up a proton and is thus an acid (hence amino "acid").
 - iv. one of 20 different "R" groups. It is the structure of the R group that determines which of the 20 it is and its special properties.

The amino acid shown here is Alanine.



Ref:

<http://users.rcn.com/jkimball.ma.ultranet/BiologyPages/A/AminoAcids.h>

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3. Nucleic acids

a. Nucleotides are the monomers of nucleic acids.

b. Nucleotides have three major regions

i. a five-carbon sugar (either ribose or deoxyribose)

ii. a phosphate group (or more than one phosphate group).

iii. a nitrogen base

c. There are only two types of nucleic acids: DNA and RNA.

d. The five bases are: adenine, thymine, guanine, cytosine, or uracil.