

Proteins

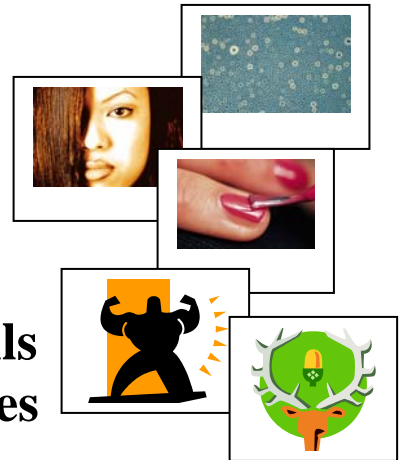
- * A **LARGE** complex **POLYMER**
- * Composed of Carbon, Hydrogen, Oxygen and Nitrogen (sometimes sulfur)
- * **ESSENTIAL TO ALL OF LIFE !!**



Why?

⊗ Proteins build structure

- Hair
- Nails
- Horns, hooves
- Membrane coverings of all cells
- Cartilage, tendons, and muscles



⊗ Carry out cell metabolism

⊗ Speed up chemical reactions (**ENZYMES****)

⊗ Transport oxygen in the bloodstream (hemoglobin)

⊗ Play a role in muscle contraction

⊗ Involved in cellular transportation (moving particles in/out of our cells)

⊗ Fighting disease (antibodies are proteins)

The basic building blocks of proteins are

amino acids

There are 20 different amino acids

- ☺ Allows for vast variety of combinations
- ☺ Proteins vary more in structure than do any other class of biological organic molecule

**Example: If I build a protein that is 3 amino acids long ...
 $20^3 = 8000$ different combinations!!
What if I wanted to build a protein that was
100 amino acids long? How many
combinations would I be able to make?**

**Amino acids linked together through
Dehydration synthesis
(just like carbohydrates !)**

Remember...this means that an -H from one amino acid and an -OH from another are removed and form 1 molecule of water

☺ Covalent bonds form between amino acids

☺ These bonds are called peptide bonds

☺ Small proteins are called peptides

- Dipeptide = 2 amino acids
- Tripeptide = 3 amino acids
- Polypeptide = many amino acids

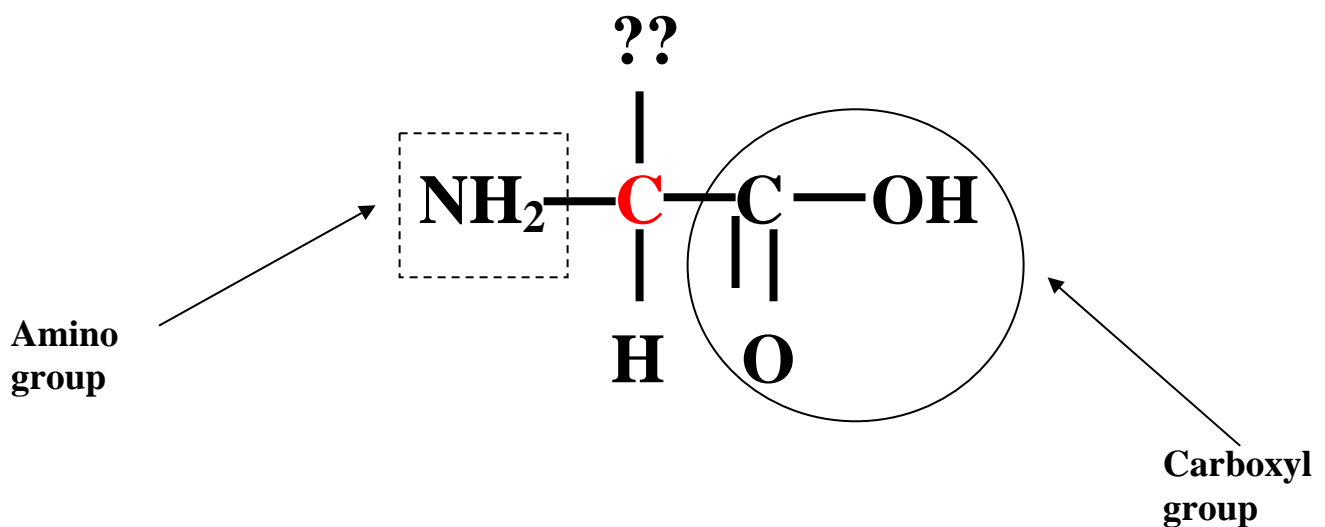
SHAPE OF PROTEINS

●* 3 dimensional

●* Can bend, twist, curl, and fold into unique shaped

●* FUNCTION of a.a. is determined by its SHAPE

●* ORDER of a. a. determines the KIND of protein it is



Let's review so far.....

4 main groups of organic compounds

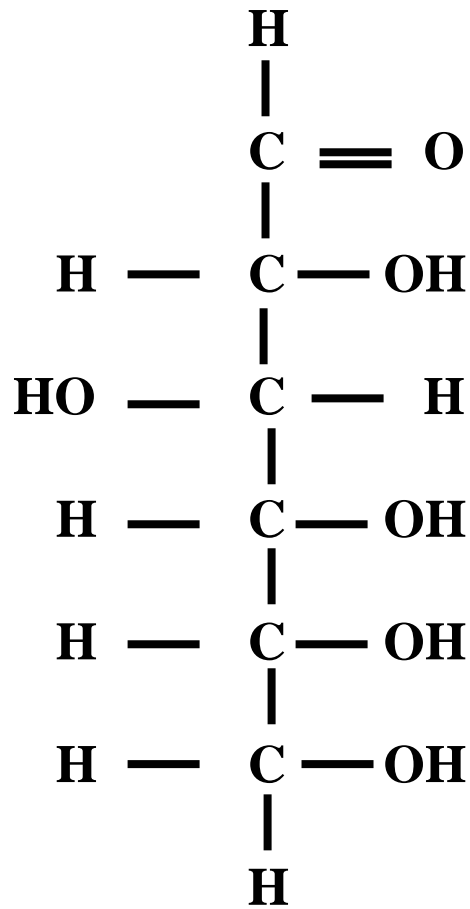
 **Carbohydrates**

 **Lipids**

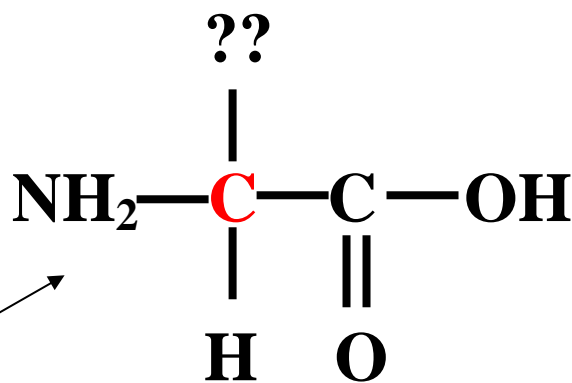
 **Proteins**

 **Nucleic Acids**

	Carbohydrates	Proteins	Lipids	Nucleic Acids
Elements contained	Carbon Hydrogen Oxygen	Carbon Hydrogen Oxygen Nitrogen		
Building blocks	monosaccharides	Amino acids		
Functions	Energy source Energy reserve Plant cell walls	Structural material Enzymes Transport		



Formula for
GLUCOSE
Hydrogen to Oxygen =
2:1



General Formula
for an
Amino Acid

Amino
group

Carboxyl
group