PROTEINS

Functions of proteins

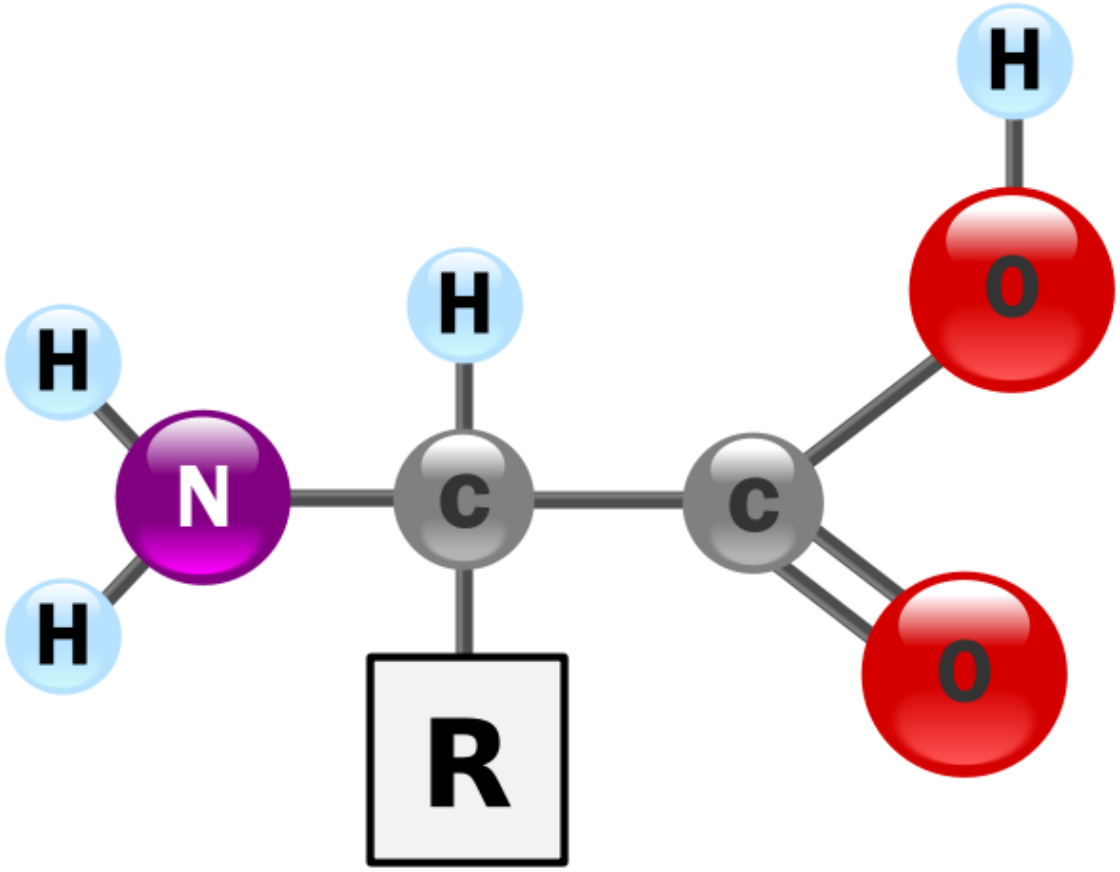
- Proteins are large, complex molecules that play many critical roles in the cell:

1. Enzymes carry out almost all of the thousands of chemical reactions that take place in cells. They also assist with the formation of new molecules by reading the genetic information stored in DNA.
2. Structural component proteins provide structure and support for cells.
3. Transport/storage proteins bind and carry atoms and small molecules within cells and throughout the body

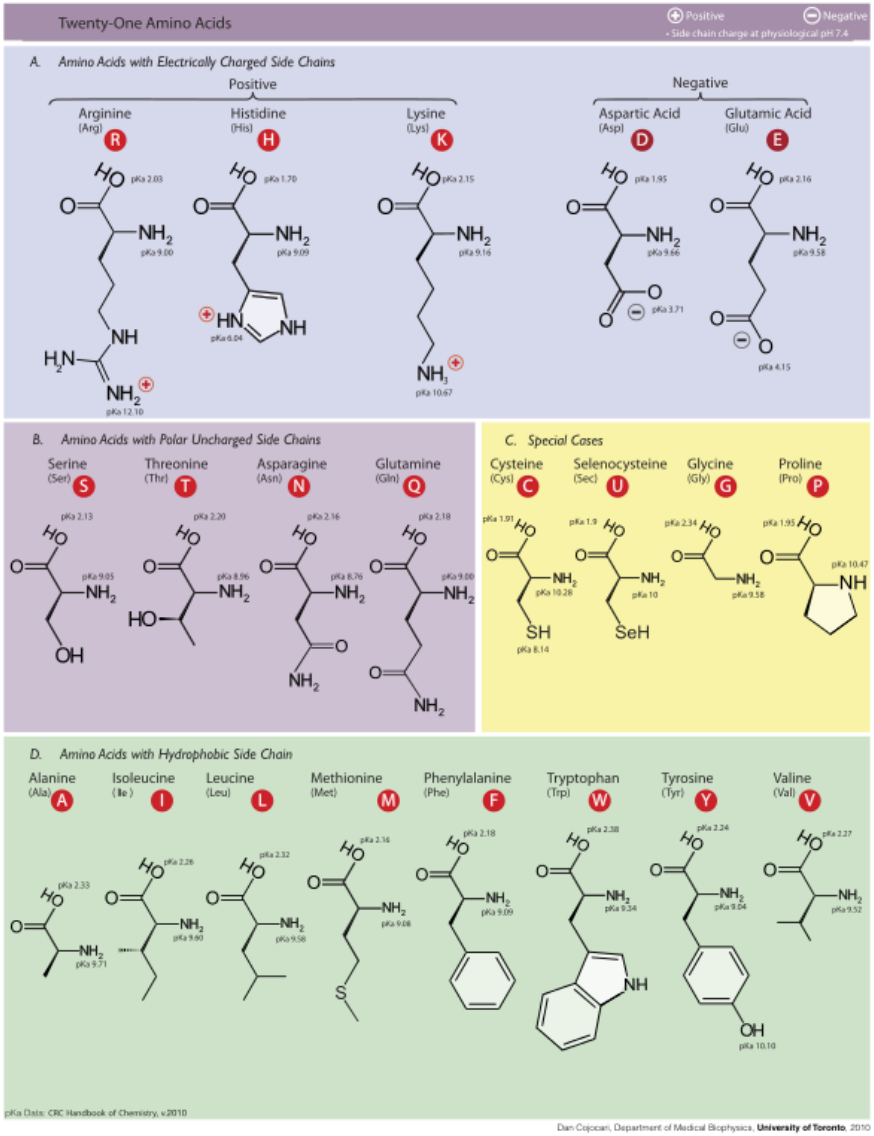
Proteins are composed of amino acids

- Proteins are made up of hundreds or thousands of smaller units called amino acids, which are attached to one another in long chains. There are 20 different types of amino acids that can be combined to make a protein.

Amino acid



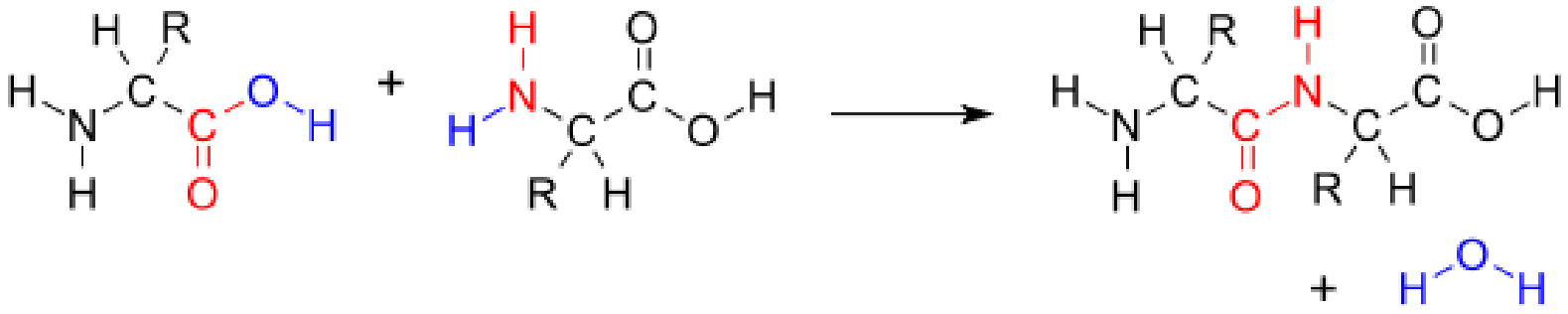
The 20 amino acids (plus selenocysteine)



Peptide bond

- Amino acids could be connected to each other by a special covalent bond called ***peptide bond***.
- In living organisms amino acids are joined by peptide bonds by enzymes which are part of a complex molecular machine called ***ribosome***.
- Peptide bond could be also created in chemical or biochemical experiment

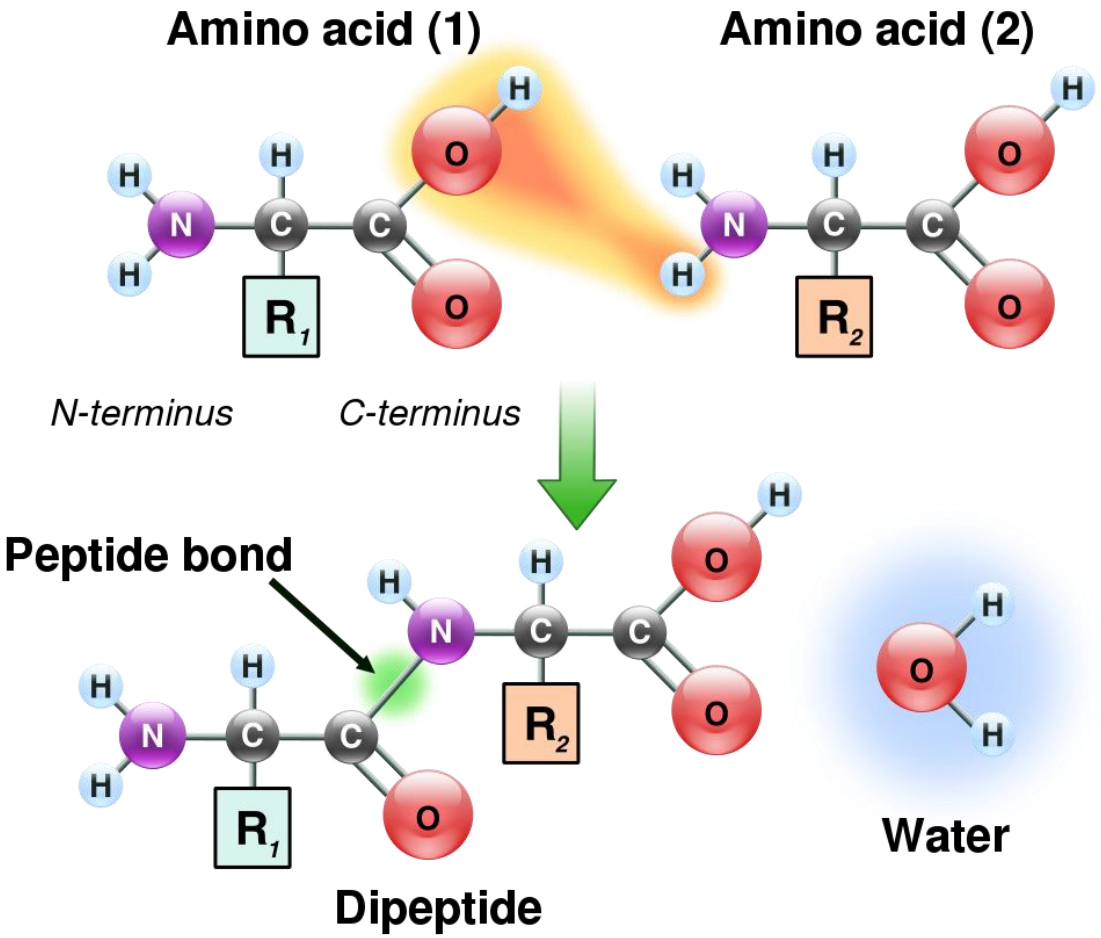
Peptide bond



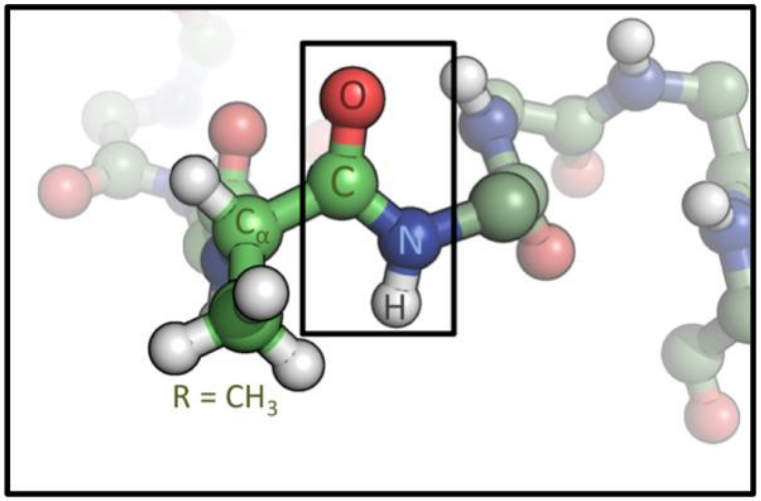
Peptides

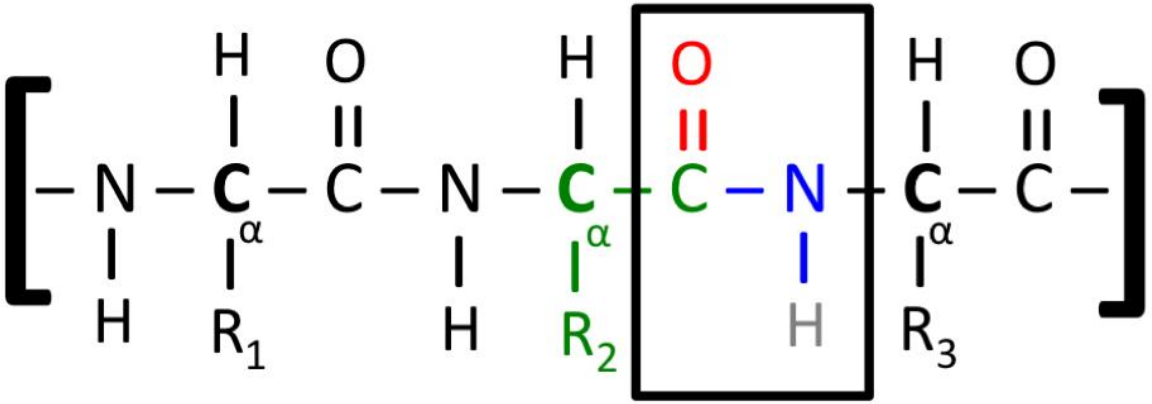
- ***Peptide*** – a molecule consisting of two or more amino acids joined together by peptide bonds.
- Peptides made up of two amino acids are called *di*peptides of three amino acids – *tri*petides, etc. Peptides made up of “many” amino acids are called *poly*ptides
- Peptides have N-terminus and C-terminus

Peptide bond



Proteins are polypeptides





Protein primary structure

- Protein primary structure is the linear sequence of amino acids in a peptide or protein.
- The sequence of amino acids determines each protein's unique 3-dimensional structure and its specific function.

Primary protein structure