الكلية	الصيدلة
القسم	فرع العلوم المختبرية والسريرية
المادة باللغة الانجليزية	Biochemistry
المادة باللغة العربية	الكيمياء الحياتية
المرحلة الدراسية	الثالثة
اسم التدريسي	م م اسامة حامد عبدالله
عنوان المحاضرة باللغة الانجليزية	Proteins
عنوان المحاضرة باللغة العربية	البروتينات
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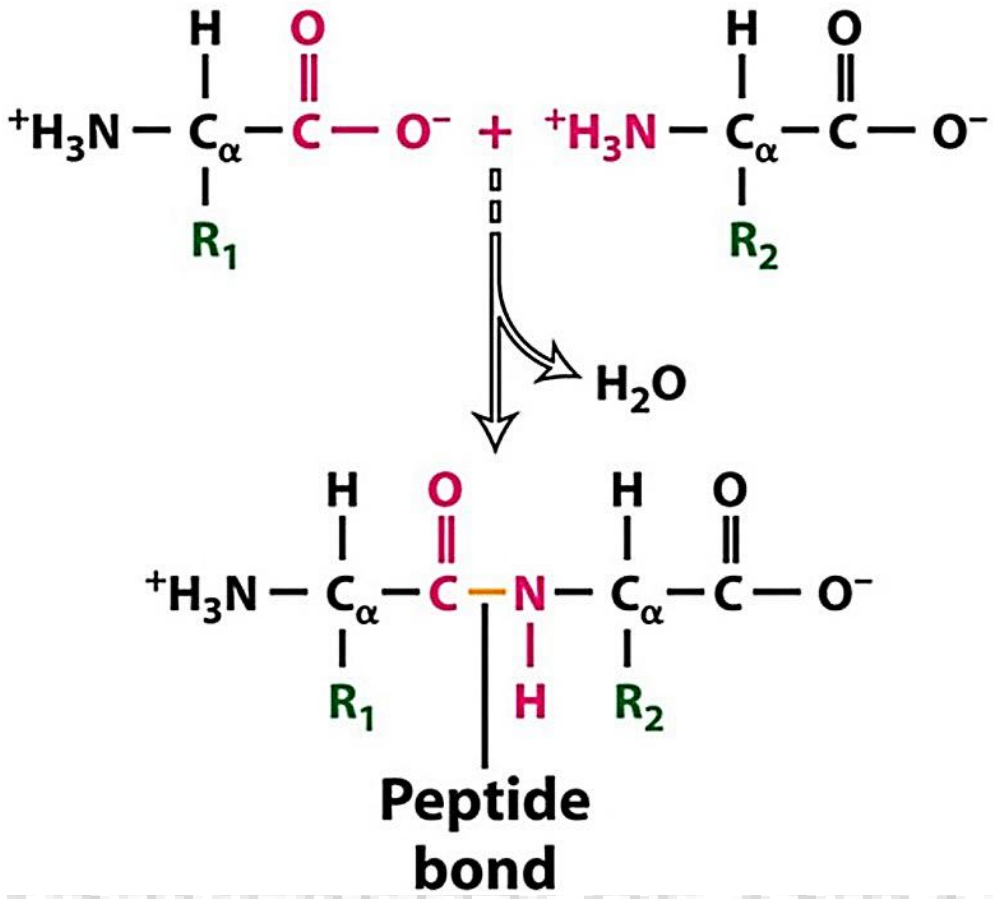
المصادر والمراجع	1. Abousalah, K. and Alnaser, A., 1996, Principles of Practical Biochemistry. 2. Farid Shokry Ataya, 2007, Practical Biochemistry. AlRoshd Publisher, Riyadh, Saudi Arabia. 3. Milio, F. R. and Loffredo, W. M., 1995, Qualitative Testing for Amino Acids and Proteins, Modular Laboratory Program in

➢Proteins

- Proteins are organic compounds with huge molecular weights consisting chains of amino acids connected together by peptide bonds, as the carboxyl group of an amino acid linked to the amine group of another amino acid.



➢ Proteins

- Proteins play an important role in the body of a living thing, as they enter into the composition of many specialized biological materials such as antibodies, enzymes, and some hormones. They also help in transmitting nerve impulses and controlling gene expression, which they are the basic component of tissues.
- Proteins similar in their physical and chemical properties those of the amino acids that make them up. Therefore, proteins have an amphoteric feature with their interaction with acids, so it carries a positive charge, while with bases we find that it acquires a negative charge. Proteins movement in the electric field depends on the PH value of the medium.
- The peptide chain that makes proteins begins with the free amino group and ends with the carboxyl group.

➢ Proteins

- Proteins differ from each other in their chemical structure depending on several factors:

1. Number and type of amino acids that make its peptide chains.
2. Arrangement and sequence of amino acids.
3. Protein binding to other non-protein molecules.

➢ Structural shapes for proteins

➢ The peptide chains that make the protein take on locative shapes resulting from the twisting of those chains, giving four structural types:

1. Primary structure.
2. Secondary structure.
3. Tertiary structure.
4. Quaternary structure.

➢ Classification of Proteins

➢ Proteins are classified into three groups according to how they bond with non-protein substances (composition):

1. Simple Proteins.
2. Conjugated Proteins.
3. Derived Proteins.

➢ Simple proteins

➢ Its molecules contain only amino acids, and when decomposed, it gives only amino acids, such as albumins and globulins.

➢ Conjugated Proteins

➢ They are proteins that bind to non-protein molecules such as nucleoproteins, lipoproteins, glycoproteins, and hemoglobin.

➢ Derived Proteins

➢ They are proteins that result from the effect of some natural, chemical, and biological factors on proteins, such as high temperatures, strong acids and bases, radiation, and PH change that changes the structure of proteins, but they retain most of the general properties of proteins.

➢ Classification of Proteins

➢ Proteins can be classified depending on their shape into:

1. Globular proteins.
2. Fibrous proteins.

➢ Globular proteins

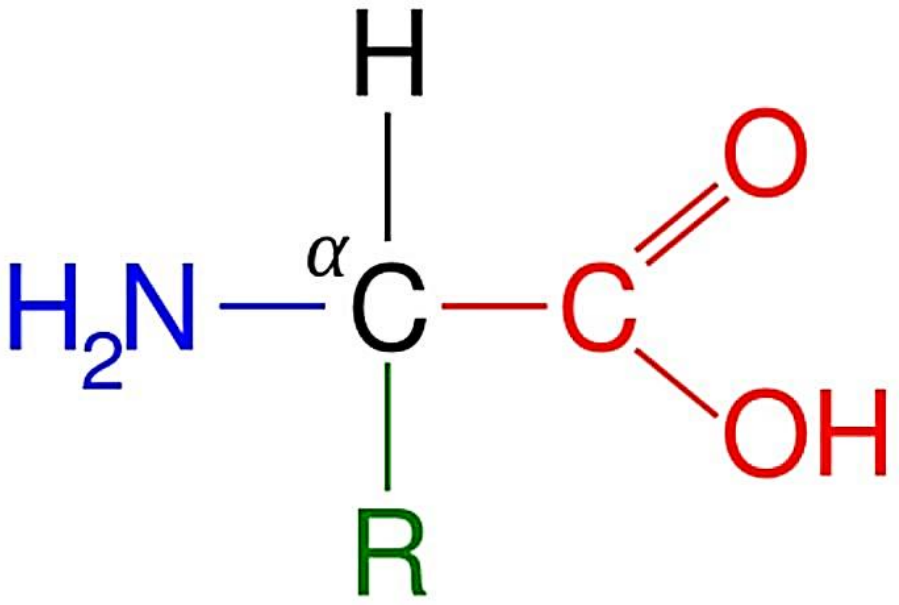
➢ These proteins have spherical shapes, dissolve easily in water, and can be identified by an excess of wrapping that produces spherical shapes like albumin, globulin, and protamine.

➢Fibrous proteins

- These are long, needle-shaped proteins that resist the activity of enzymes that breakdown protein also they are insoluble in water like keratin, collagen, and elastin.

➢ Amino Acids

- They are the basic units to make proteins. There are twenty amino acids that have been discovered in nature. Each amino acid contains an amine group, a carboxyl group, a hydrogen atom, and a terminal R group that differs from one acid to another.



➢ Classification of Amino Acids

1. Essential Amino Acids: Cannot be made by the body, so we need to take them from outside, i.e. food sources (histidine, isoleucine, leucine, lysine, methionine, phenylalanine, threonine, tryptophan, and valine).
2. Nonessential Amino Acids: Means that our bodies can produce them, even if we do not get it from the food we eat (alanine, arginine, asparagine, aspartic acid, cysteine, glutamic acid, glutamine, glycine, proline, serine, and tyrosine).
3. Conditional Amino Acids: Usually not essential, except in times of illness and stress (arginine, cysteine, glutamine, tyrosine, glycine, ornithine, proline, and serine).