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Subject: Practical Biochemistry

Stage: 2nd class

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Lab 5: Total Protein

مختبر: البروتين الكلي



Ministry of Higher Education and

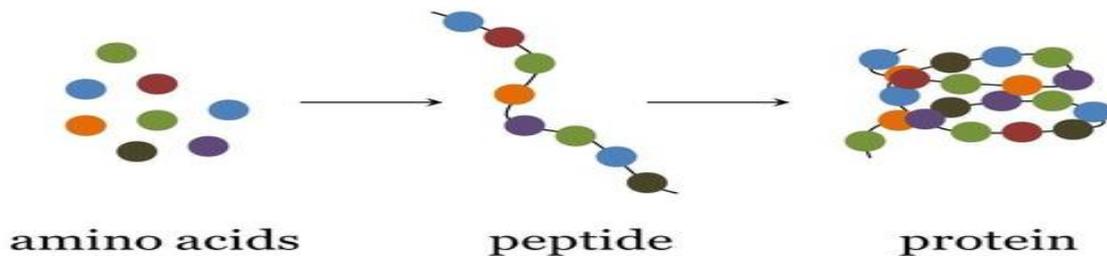
Scientific Research

University of Anbar

College of Dentistry

SERUM PROTEINS

Proteins are the most abundant compounds in your serum. Amino acids are the building blocks of all proteins. In turn proteins are the building blocks of all cells and body tissues. They are the basic components of enzymes, many hormones, antibodies and clotting agents. Proteins act as transport substances for hormones, vitamins, minerals, lipids and other materials. In addition, proteins help balance the osmotic pressure of the blood and tissue. Finally, serum proteins serve as a reserve source of energy for your tissues and muscle.



The major measured serum proteins are divided into two groups, albumin and globulins. There are four major types of globulins, each with specific properties and actions. A typical blood panel will provide four different measurements - the total protein, albumin, globulins, and the albumin globulin ratio.

Total Protein

Because the total protein represents the sum of albumin and globulins, it is more important to know which protein fraction is high or low than what is the total protein. Ideally, the total protein will be approximately 7.5 g/dl.

Optimal Range: 6.4 to 8.3 g/dl

Total protein may be elevated due to:

- Chronic infection (including tuberculosis)
- Liver dysfunction
- Hypersensitivity States
- Hemolysis
- Alcoholism
- Leukemia

Total protein may be decreased due to:

- Malnutrition and malabsorption (insufficient intake and/or digestion of proteins)
- Liver disease (insufficient production of proteins)
- Diarrhea
- Severe burns (loss of protein through the skin)
- Hormone Imbalances that favor breakdown of tissue

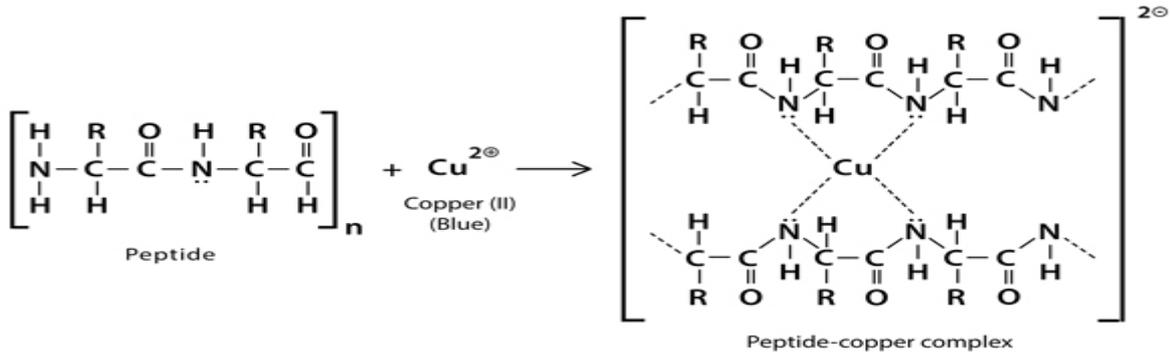
Determination of Total serum protein

BIURET METHOD

Principle:

In the biuret reaction, a chelate is formed between the Cu^{+2} ion and the peptide bonds of the proteins in alkaline solutions to form a violet colored complex whose absorbance is measured photometrically. The intensity of the color produced is proportional to the concentration of protein in the sample.

Biuret Test



PROCEDURE:

1. Pipette into labelled tubes:

TUBES	Blank	Sample	Standard
R1.Biuret	1.0 mL	1.0 mL	1.0 mL
Sample	-	20 μL	-
CAL. Standard	-	-	20 μL

2. Mix and incubate the tubes 10 minutes at 37°C

3. Read the absorbance (A) of the samples and the standard at 540 nm against the reagent blank.

Calculation

$$\frac{A_{\text{Sample}}}{A_{\text{Standard}}} \times C_{\text{Standard}} = \text{g/dL total protein}$$