



DETERMINATION OF SERUM ALBUMIN

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Advanced Clinical Biochemistry I

Fall Semester

Week Four

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Objectives

- At the end of this lab session, **students should understand:**
- What albumin protein is
- The clinical significance of albumin tests
- The principles behind the albumin test
- The step-by-step procedures of the test



Clinical Significance & Function

- Albumin is synthesized in the liver and constitutes a major part of the total proteins in the body.
- The other part is globulin, which forms the major portion of the dissolved substances in the plasma.

- Functions of albumin include the distribution of extracellular fluid.
- Regulation of osmotic pressure, and acting as a transport agent for various substances such as hormones, lipids, vitamins, etc.
- Increased levels are seen in dehydration.
- Decreased levels are seen in liver disease (Hepatitis, Cirrhosis), malnutrition, kidney disorders, and increased fluid loss during extensive burns and malabsorption.

Material and Reagents

- **Serum /Plasma Sample**
- **Albumin reagent: (safe to handle)**
 - Succinate buffer (pH 4.2) 75 mmol/L
 - Bromocresol green 0.14 g/L
- **Albumin standard: (safe to handle)**
 - Standard concentration (3 g/dL)

Principle

The reaction between albumin from serum or plasma and the day bromocresol-green procedure is a color change that is proportional to the albumin concentration, which will be absorbed at 630 nm.

Procedure

	Blank (μL)	Standard (μL)	Sample (μL)
Reagent	1000	1000	1000
Standard		10	
Sample			10

Mix and incubate for 1 minute. Measure the absorbance of the standard and sample against the reagent blank at 630 nm

Calculation of result

$$\text{albumin (mg/dl)} = \frac{A_{\text{sample}}}{A_{\text{standard}}} \times 3 \text{ (std conc.)}$$

Reference Value:

- **Serum:** **3.8 – 5.4 g/dL (0 – 20 years)**
 3.5 – 5.2 g/dL (21 – 60 years)
 3.2 – 4.6 g/dL (61 – 90 years)
 2.9 – 4.5 g/dL (>90 years)

Practical Report

- Refer to practical note 1 and write a step-by-step practical report for today's experiment.
- The report should comprise all the components outlined in the standard report format and should not be more than five (5) or less than three (3) pages.
- The submission date is Tuesday 3rd December 2024 during practical session

