# Cihan University - Sulaimaniya

# Clinical Biochemistry

## Lab. 8

## Measurement of Albumin

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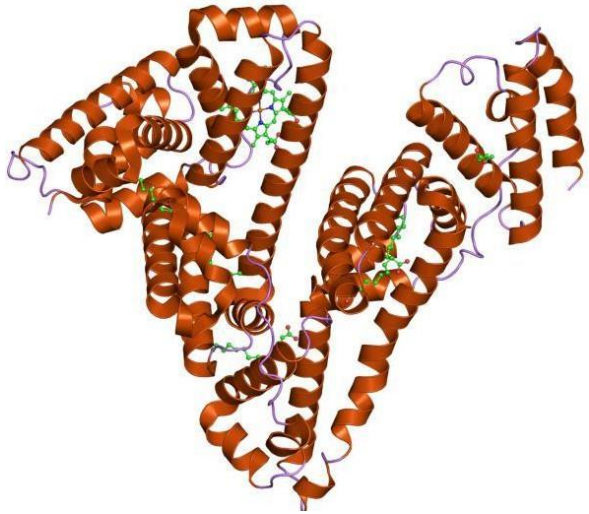
# Introduction

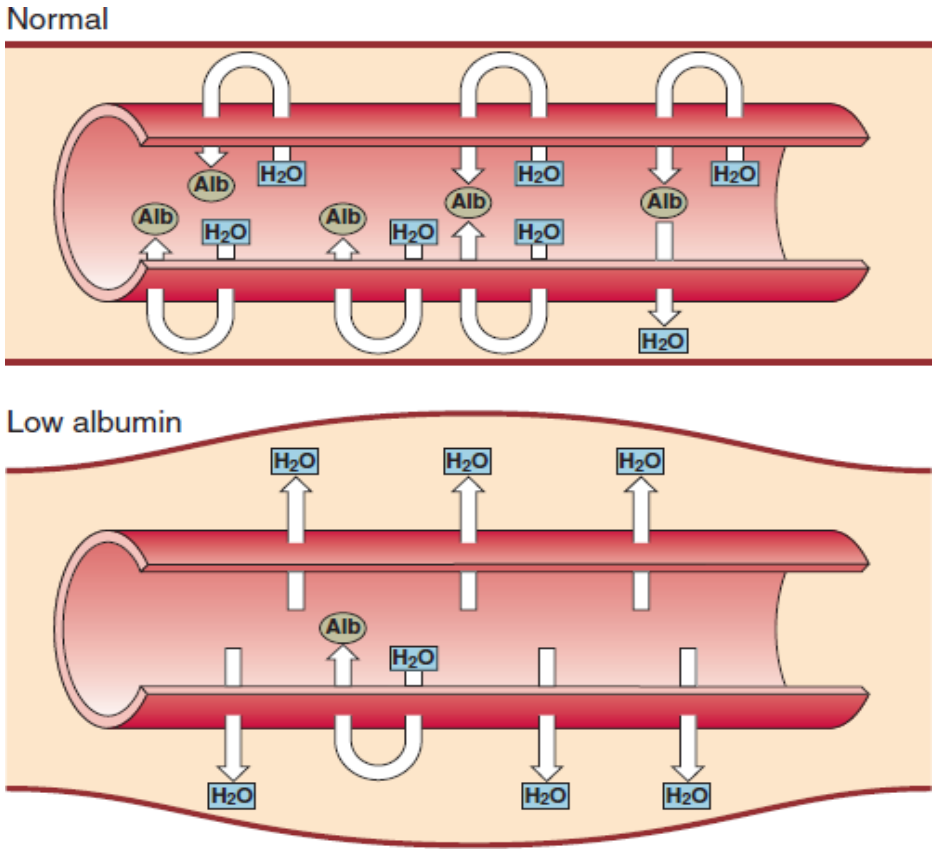
- Most abundant plasma protein (3.5-5.0 g/dl) in normal adult
- Forms - 55%-60% of total plasma proteins
- **Normal value -** 3.5-5.0 g/dl
- Half-life in plasma: 20 days
- Decreases rapidly in **injury, infection and surgery**
- Structure **- a single peptide chain of 585 amino** acids



# function of Albumin

- **Plasma Colloid Osmotic Pressure**

- **Carrier**



# Hypoalbuminemia

Hypoalbuminemia means low blood albumin levels

- **Causes of Hypoalbuminemia**
  - ❑ **Decreased albumin synthesis**
    - liver cirrhosis
    - malnutrition
  - ❑ **Increased losses of albumin**
    - Increased **catabolism in infections**
    - Excessive excretion by the kidneys (nephrotic syndrome)
    - Excessive loss in bowel
    - Severe burns (plasma loss in the absence of skin barrier)

# Hyperalbuminemia

Hyperalbuminemia is an increased concentration of albumin in the blood.

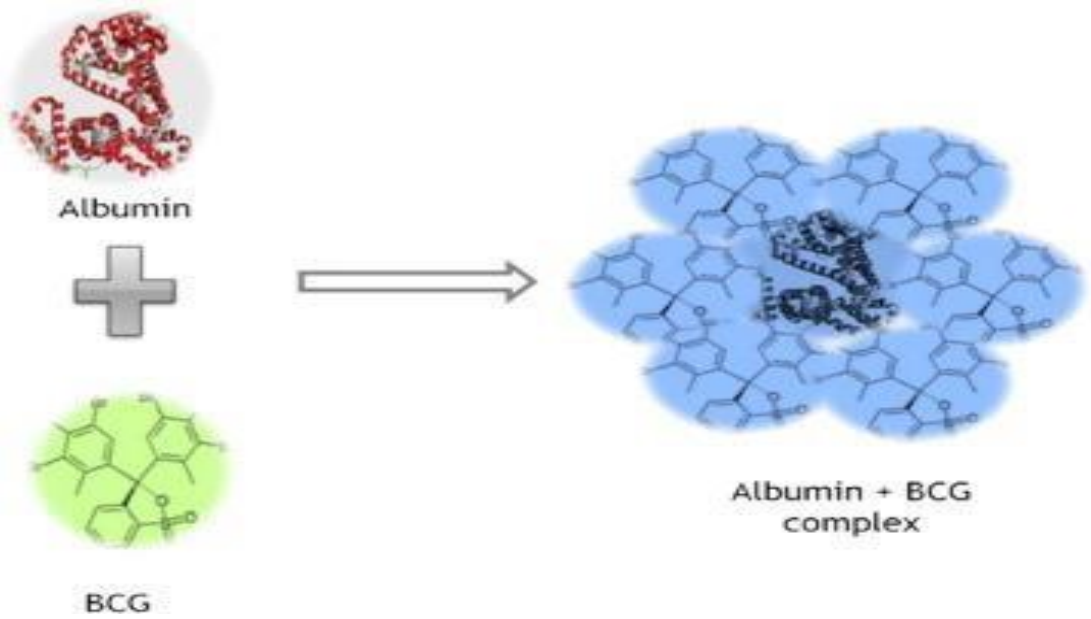
**Cause of Hyperalbuminemia**

- Typically, this condition is due to dehydration.
- Hyperalbuminemia has also been associated with high protein diets.

# Principle of albumin Test

## PRINCIPLE (1) (2)

In buffered solution at pH 4.2, bromocresol green binds albumin to form a colored compound which absorbance, measured at 630 nm (620-640) is proportional to the albumin concentration in the specimen.



# Reagents

## REAGENT COMPOSITION

**R1 ALBUMIN** Reagent

| | | |
|---|---|---|
| Succinic acid | 83 | mmol/L |
| Bromocresol green (BCG) | 167 | µmol/L |
| Sodium hydroxide | 50 | mmol/L |
| Polyoxyethylene monolauryl ether | 1.00 | g/L |
| Preservative | | |

**ATTENTION**, Met. Corr.1: H290 – May be corrosive for metals

P234: Keep only in original container, P390: Absorb spillage to prevent material damage. Classification due to: Sodium Hydroxide < 1% For more details, refer to Safety data sheet (SDS)

**R2 ALBUMIN** Standard

Bovine albumin 5.0 g/dL (725 µmol/L)

According to 1272/2008 regulation, this reagent is not classified as dangerous

# Procedure and Calculation

| Pipette into well identified test tubes: | Blank | Standard | Assay |
|---|---|---|---|
| Reagent | 1 mL | 1 mL | 1 mL |
| Demineralised water | 10 µL | | |
| Specimen | | | 10 µL |
| Standard | | 10 µL | |
| Mix well. Record absorbance at 630 nm (620-640) within 10 minutes against reagent blank or better after exactly 5 minute (note 2). | | | |