

# Proteins

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# INTRODUCTION

- ▶ Protein name is derived from a Greek word PROTOS which means “the first or the supreme.”
- ▶ Proteins are extremely complicated and nitrogenous molecules made up of a variable number of amino acid residues joined to each other by a specific covalent bond called peptide bond.
- ▶ 20 amino acids which have been found to occur in all proteins, known as standard amino acids.

# Why are proteins important to us:

- ▶ Proteins make up about 15% of the mass of the average person
- ▶ Enzyme act as a biological catalyst
- ▶ Storage and transported - Hemoglobin
- ▶ Defenses -Antibodies
- ▶ Hormones - Insulin

# Structure of Proteins

► Biochemists have distinguished several levels of structural organization of proteins. They are:

**1-Primary structure**

**2- Secondary structure**

**3-Tertiary structure**

**4- Quaternary structure**

# PRIMARY STRUCTURE

- ▶ The primary structure of protein refers to the sequence of amino acids (Building blocks of proteins) present in the polypeptide chain.
- ▶ Amino acids are covalently linked by peptide bonds.
- ▶ Peptide bonds are responsible for maintaining the primary structure.

# IMPORTANCE OF PRIMARY STRUCTURE

- ▶ Many genetic diseases result from abnormal amino acid sequences.
- ▶ To understand the molecular mechanism of action of proteins.

# Secondary Structure

- ▶ The secondary structure of a protein is defined as a local spatial structure of a certain peptide segment.

# Tertiary Structure

- ▶ The tertiary structure is defined as the three-dimensional arrangement of all atoms of a protein.



# Quaternary Structure

- ▶ The quaternary structure is defined as the spatial arrangement of multiple subunits of a protein.

# Types of Proteins

- ▶ **Transport Proteins**

These are those proteins which help in transportation of life sustaining chemicals vital gases and nutrients.

- ▶ **Storage Proteins**

These are those stored inside the cells or tissue as reserved food and can be mobilized at the time of nutrient requirement to provide energy.

# Cont.....

- ▶ **Motile/ Contractile Proteins**

Move muscles, the ability to contract to change the shape or to move about.

- ▶ **Structural Proteins**

This type of protein form major component of cartilages and bones.

# Cont.....

- ▶ **Regulatory Protein**

Some proteins help to regulate cellular or physiological activity.