

## Quiz

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### **Q1: Difference Between Tertiary and Quaternary Structure of Protein?**

**Answer:**

#### **Tertiary Structure**

The overall three-dimensional structure of a polypeptide is called its tertiary structure. The tertiary structure is primarily due to interactions between the R groups of the amino acids that make up the protein.

R group interactions that contribute to tertiary structure include hydrogen bonding, ionic bonding, dipole-dipole interactions, and London dispersion forces – basically, the whole gamut of non-covalent bonds.

#### **Quaternary Structure**

Many proteins are made up of a single polypeptide chain and have only three levels of structure (the ones we've just discussed). However, some proteins are made up of multiple polypeptide chains, also known as subunits. When these subunits come together, they give the protein its quaternary structure.

hemoglobin carries oxygen in the blood and is made up of four subunits, two each of the  $\alpha$  and  $\beta$  types.

### **Q2: Difference Between Greek Key Motif and Jelly Roll Motif?**

**Answer:**

#### **Greek Key Motif**

Greek Key Motif (Molecular Biology) The Greek key motif describes a particular topology for arranging four  $\beta$ -strands into an antiparallel  $\beta$ -sheet in protein structures. The name comes from the similarity between this  $\beta$ -strand topology and a decorative pattern used in ancient Greece (also called the Greek key).

## **Jelly Roll**

The jelly roll motif describes a particular topology for arranging eight  $\beta$ -strands into an antiparallel  $\beta$ -sheet that is frequently found in protein structures (Fig. 1). The name comes from the similarity between this  $\beta$ -strand topology and a slice of rolled cake, called a jelly roll or Swiss roll.

### **Q3: Difference Between Hemoglobin and Myoglobin?**

**Answer:**

#### **Hemoglobin**

Hemoglobin is the heme protein molecules found in red blood cells, carrying oxygen from the lungs to the body's tissue and returns carbon dioxide from the tissue back to the lungs.

Hemoglobin has less affinity for binding oxygen and its concentration is higher in RBC (red blood cells). So when oxygen binds to the first subunit of hemoglobin, it changes into the quaternary structure of the protein and thus making easier for other molecules to bind.

#### **Myoglobin**

Myoglobin is a kind of heme proteins, serving as an intracellular storage site for oxygen. During the deprivation of oxygen, the bound oxygen called as oxymyoglobin is released from its bound form and further used for other metabolic purposes.

As myoglobin has tertiary structure, which is easily soluble in water, in which its characters which are exposed on the surface of the molecules are hydrophilic while those molecules which are packed into the interior of the molecule are hydrophobic in nature.

### **Q4: Difference Between Hairpin and Loop?**

**Answer:** A beta hairpin contains a turn and two strands - no loop. A loop implies at least a few residues with no specific  $2\gamma$  structure between two  $2\gamma$  structure elements.

### **Q5: Difference Between Polar and Nonpolar Amino Acids Interactions?**

**Answer:** Properties of amino acids are grouped based on the functional side chains (R), and one such property is hydrophobicity. If the R group is repelled by water, then it is hydrophobic (nonpolar), eg, valine; whereas hydrophilic (polar) amino acids are attracted to water, eg, arginine.

### **Q6: Difference Between Up and Down and Greek Key Motif?**

**Answer:**

#### **Greek Key Motif**

Greek Key Motif (Molecular Biology) The Greek key motif describes a particular topology for arranging four  $\beta$ -strands into an antiparallel  $\beta$ -sheet in protein structures. The name comes from the similarity between this  $\beta$ -strand topology and a decorative pattern used in ancient Greece (also called the Greek key).

#### **Up and Down**

The simplest topology for an antiparallel beta sheet involves loops connecting adjacent strands.

### **Q7: Difference Between Hemoglobin and Helix Bundle?**

**Answer:**

#### **Hemoglobin**

Hemoglobin is the heme protein molecules found in red blood cells, carrying oxygen from the lungs to the body's tissue and returns carbon dioxide from the tissue back to the lungs.

Hemoglobin has less affinity for binding oxygen and its concentration is higher in RBC (red blood cells). So when oxygen binds to the first subunit of hemoglobin, it changes into the quaternary structure of the protein and thus making easier for other molecules to bind.

#### **Helix Bundle**

A helix bundle is a small protein fold composed of several alpha helices that are usually nearly parallel or antiparallel to each other.