

## Activity 41: Structure–Function Relationships in Proteins

### *Learning Objective*

*Appreciate the structure–function relationship in several sample proteins*

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**Estimated Completion Time**      30 Minutes

### **Instructor Information**

Activity could be supplemented with extra information about the structure and function of the protein examples.

### **ANSWERS TO QUESTIONS**

1.

Protein	Structure	Function
<b>Hemoglobin</b>	Globular protein with polar amino acids on the exterior	Transport oxygen through the bloodstream to the tissues
<b>Collagen</b>	Fibrous protein consisting of a rope-like triple helix	Found in connective tissue where strength is needed
<b>Na<sup>+</sup> / K<sup>+</sup> ATPase</b>	Membrane protein with nonpolar amino acids on the exterior portion facing the phospholipid tails and polar amino acids facing the interior channel	Pump Na <sup>+</sup> and K <sup>+</sup> ions through the cell membrane maintaining cellular concentrations of both ions

2. Glu is polar charged and Val is nonpolar. The change introduces a nonpolar residue that changes the protein shape.
3. The amino acid sequence and structure of a protein dictate the protein's function.

### **Activity 41: Skill Development**

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1. The amino acid side chains facing the cell membrane interior must have nonpolar residues present.
2. Keratin is fibrous and forms a strong rope-like structure that can cover and keep the skin warm.