Amino acids & structure

Five written practice questions. Work through this page before opening the separate answer key on page 2.

Question 1

Give the one-letter and three-letter codes for glycine and alanine. What is the side chain of each?

Question 2

Describe which backbone atoms a peptide bond connects. How does a peptide bond differ from a side-chain interaction?

Question 3

Classify amino-acid sequence, an alpha helix, one folded polypeptide and an assembly of several subunits by structural level.

Question 4

Explain one role of a molecular chaperone. Why is assisted folding different from changing the amino-acid sequence?

Question 5

A peptide has a carefully drawn three-dimensional structure. Does this alone establish that it benefits patients? Explain the missing evidence.

Explained answer key

Use this as feedback, not a memorization score. Return to the original references for diagrams and fuller explanations.

Answer 1

Glycine: G / Gly, with hydrogen as its side chain. Alanine: A / Ala, with a methyl side chain.[1]

Answer 2

A backbone peptide bond joins a carboxyl-derived carbon of one residue to the amino nitrogen of the next; it is an amide linkage, not merely a noncovalent attraction between side chains.[2]

Answer 3

Sequence: primary. Alpha helix: secondary. The three-dimensional fold of one polypeptide: tertiary. A multi-subunit assembly: quaternary.[1]

Answer 4

Chaperones can assist folding and prevent inappropriate intermolecular interactions or aggregation; the sequence still specifies the polypeptide rather than being rewritten by the chaperone.[2]

Answer 5

No. A structural model or molecular-identity description is not a patient outcome; appropriate human evidence is needed to evaluate a clinical benefit claim. Eloralintide's structural discovery work and clinical trial answer different questions.[3]

PAGE SOURCES

1. OpenStax Biology 2e: Proteins: https://openstax.org/books/biology-2e/pages/3-4-proteins
2. Alberts et al.: protein structure: https://www.ncbi.nlm.nih.gov/books/NBK26830/
3. Eloralintide randomized trial: https://pubmed.ncbi.nlm.nih.gov/41207310/