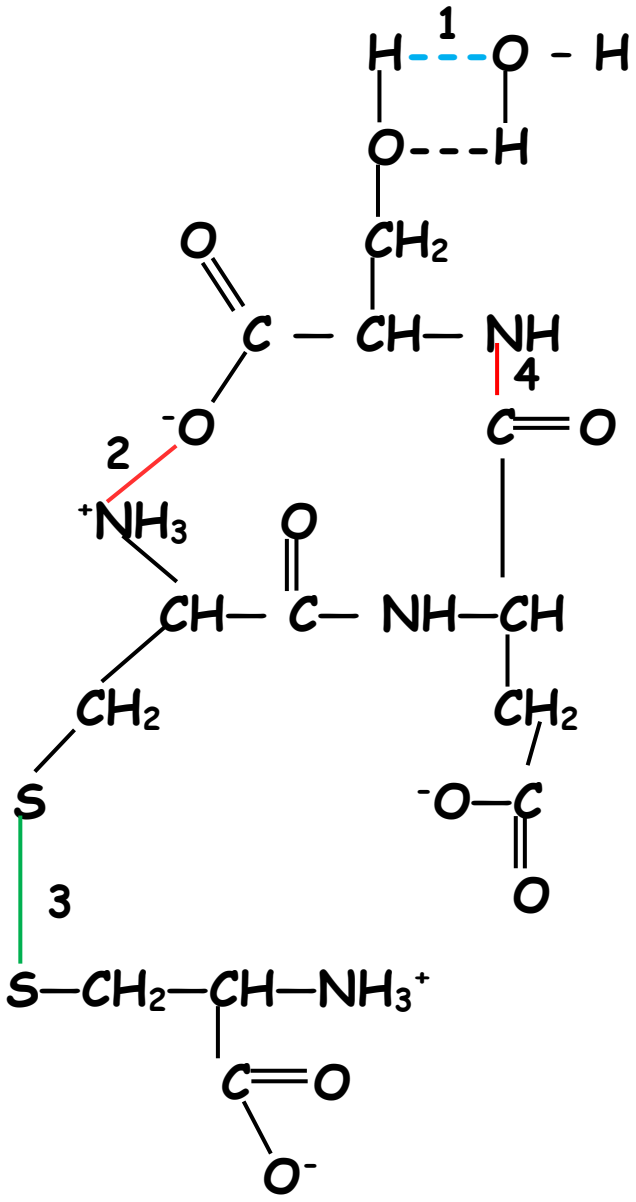
Q_1: In the figure below, four bonds are indicated by number. Match the bonds with their correct description below.



A)(1)Electrostatic interaction , (2)Hydrogen bond ,(3)Disulfide bond , (4)Peptide bond

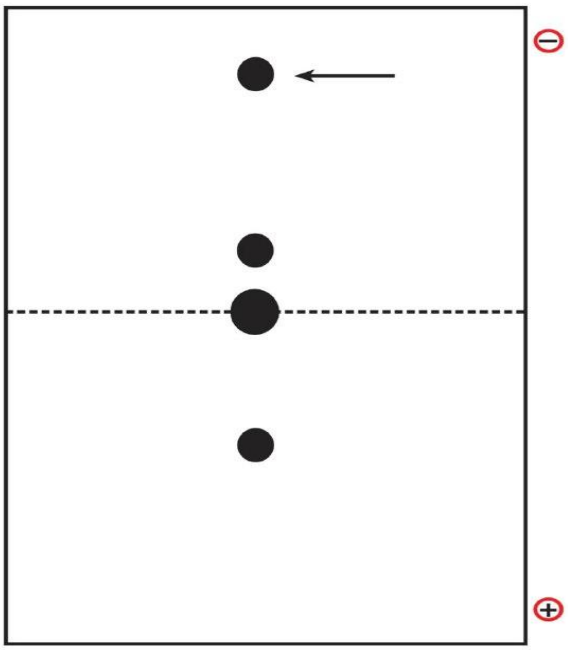
B) (1) Hydrogen bond, (2) Peptide bond ,(3)Disulfide bond , (4) Electrostatic interaction

C) (1) Hydrogen bond, (2) Disulfide bond,(3) Electrostatic interaction , (4) Peptide bond

D) (1) Hydrogen bond, (2) Electrostatic interaction, (3) Disulfide bond, (4) Peptide bond

E) (1) Hydrogen bond, (2) Electrostatic interaction, (3) Peptide bond, (4) Disulfide bond

Q_2: The peptide Ala-Arg-His-Gly-Glu is treated with peptidases to release all of the amino acids. The solution is adjusted to pH 7, and electrophoresis is performed. In the electrophoretogram depicted below, the amino acid indicated by the arrow is most likely to be

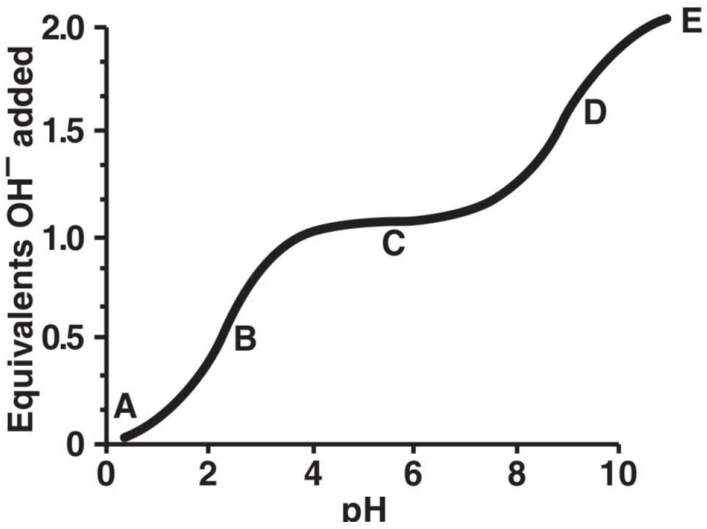


A. Glycine B. Arginine C. Glutamate
D. Histidine E. Alanine

Q_3: Several complexes in the mitochondrial electron transport chain contain non-heme iron. The iron in these complexes is bound tightly to the thiol group of which amino acid?

A. Glutamine B. Methionine C. Cysteine
D. Tyrosine E. Serine

Q4: The letters A through E designate certain regions on the titration curve for glycine (shown below). Which one of the following statements concerning this curve is correct?



A. Point A represents the region where glycine is deprotonated.

B. Point B represents a region of minimal buffering.

C. Point C represents the region where the net charge on glycine is zero.

D. Point D represents the pK of glycine's carboxyl group.

E. Point E represents the pI for glycine.

Q5: Which one of the following statements concerning the peptide shown below is correct?

Gly-Cys-Glu-Ser-Asp-Arg-Cys

A. The peptide contains glutamine.

B. The peptide contains a side chain with a secondary amino group.

C. The peptide contains a majority of amino acids with side chains that would be positively charged at pH 7.

D. The peptide is able to form an internal disulfide bond.

Q_6: A peptide bond:

A. Has a partial double-bond character.

B. Is ionized at physiologic pH.

C. Is cleaved by agents that denature proteins, such as organic solvents and high concentrations of urea.

D. Is stable to heating in strong acids.

E. Occurs most commonly in the cis configuration

Q_7: Which one of the following statements is correct?

A. The α-helix can be composed of more than one polypeptide chain.

B. β-Sheets exist only in the antiparallel form.

C. β-Bends often contain proline.

D. Domains are a type of secondary structure.

E. The α-helix is stabilized primarily by ionic interactions between the side chains of amino acids.

Q_8: Which one of the following statements about protein structure is correct?

A. Proteins consisting of one polypeptide can have quaternary structure.

B. The formation of a disulfide bond in a protein requires that the two participating cysteine residues be adjacent to each other in the primary sequence of the protein.

C. The stability of quaternary structure in proteins is mainly a result of covalent bonds among the subunits.

D. The denaturation of proteins always leads to irreversible loss of secondary and tertiary structure.

E. The information required for the correct folding of a protein is contained in the specific sequence of amino acids along the polypeptide chain.

Q_9: Glycine and proline are the most abundant amino acids in the structure of:

A)Hemoglobin B) Myoglobin

C) Insulin D) Collagen

Q_{10}: the side chain of the His contains:

A)Indole ring B) Phenol group

C)Imidazole ring D)Guanidino ring

E)Both A,D

Q_{11}: which of the following proteins does not possess a quaternary structure?

A) myoglobin B) keratin C) hemoglobin

D) immunoglobin E) collagen

Q_{12}: if cysteine residues in immunoglobin were replaced with methionine then:

A) tertiary and quaternary structures are disrupted

B) immunoglobin's become polyclonal and monoclonal antibodies cannot form

C) Immunoglobin's cannot form pentamers

D) class switching occurs

E) reducing SDS-PAGE will reveal 4 bands

Q_{13}: The oxygen dissociation curve for hemoglobin is sigmoidal in shape , indicating that the subunits cooperate in binding oxygen. Cooperative binding of oxygen by the four subunits of hemoglobin means that the binding of an oxygen molecule at one heme group ……. the ……. affinity of the remaining heme groups in the same hemoglobin molecule.

A)Increases, oxygen **B)Decreases, CO_2**

C)Doesn't affect, O_2 **D)Doesn't affect, CO_2.**

Q_{14}: Effect of carbon monoxide on the oxygen affinity of hemoglobin. CO-Hb represented by the graph:

1-Carbon monoxide (CO) binds tightly (and irreversibly) to the hemoglobin iron.

2-When CO binds to one or more of the four heme sites, hemoglobin shifts to the relaxed conformation, causing the remaining heme sites to bind oxygen with low affinity

3-This shifts the oxygen dissociation curve to the left, and changes the normal hyperbola shape toward a sigmoidal.

4- the affected hemoglobin is unable to release oxygen to the tissues.

The correct statements :

A)1,4 B)1,2 C)4,1,2 D)4 only C)1 only.

Q15:A 30-year-old woman presented with progressive shortness of breath. She denied the use of cigarettes. A family history revealed that her sister had suffered from unexplained lung disease. Which one of the following etiologies most likely explains this patient's pulmonary symptoms?

A. Deficiency of proline hydroxylase

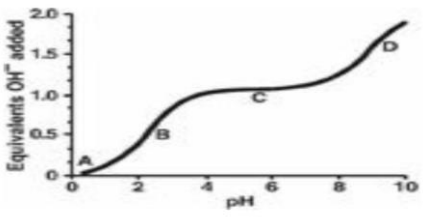
B. Deficiency of α1-antitrypsin

C. Deficiency in dietary vitamin C

D. Decreasedelastaseactivity

E. Increased collagenase activity

Q16:Which one of the following statements concerning the titration curve for a nonpolar amino acid is correct? The letters A through D designate certain regions on the curve below.



A. Point A represents the region where the amino acid is deprotonated.

B. Point B represents a region of minimal buffering.

C. Point C represents the region where the net charge on the amino acid is zero.

D. Point D represents the pK of the amino acid's carboxyl group.

E. The amino acid could be lysine.

Q_{17}:Which one of the following statements concerning protein structure is correct?

A. Proteins consisting of one polypeptide have quaternary structure that is stabilized by covalent bonds.

B. The peptide bonds that link amino acids in a protein most commonly occur in the cis configuration.

C. The formation of a disulfide bond in a protein requires the participating cysteine residues to be adjacent in the primary structure.

D. The denaturation of proteins leads to irreversible loss of secondary structural elements such as the α-helix.

E. The primary driving force for protein folding is the hydrophobic effect.

Q_{18}:In comparing the α-helix to the β-sheet, which statement is correct only for the β- sheet?

A. Extensive hydrogen bonds between the carbonyl oxygen (C=O) and the amide hydrogen (N-H) of the peptide bond are formed.

B. It may be found in typical globular proteins.

C. It is stabilized by interchain hydrogen bonds.

D. it is an example of secondary structure.

E. It may be found in supersecondary structures

Q_{19}: A particular point mutation results in disruption of the α-helical structure in a segment of the mutant protein. The most likely change in the primary structure of the mutant protein is:

A. glutamate to aspartate.

B. lysine to arginine.

C. methionine to proline.

D. valine to alanine.

Q_{20}: Which one of the following statements concerning the hemoglobins is correct?

A. HbA is the most abundant hemoglobin in normal adults.
B. Fetal blood has a lower affinity for oxygen than does adult blood because HbF has an increased affinity for 2,3-bisphosphoglycerate.

C. The globin chain composition of HbF is α2δ2.

D. HbA_{1c} differs from HbA by a single, genetically determined amino acid substitution.

E. HbA_2 appears early in fetal life.

Q_{21}:Which one of the following statements concerning the ability of acidosis to precipitate a crisis in sickle cell anemia is correct?

A. Acidosis decreases the solubility of HbS.

B. Acidosis increases the affinity of hemoglobin for O2.
C. Acidosis favors the conversion of hemoglobin from the taut to the relaxed conformation.

D. Acidosis shifts the oxygen-dissociation curve to the left.

E.Acidosis decreases the ability of2,3-bisphosphoglycerate to bind to hemoglobin

Q_{22}:Which one of the following statements concerning the binding of oxygen by hemoglobin is correct?

A. The Bohr effect results in a lower affinity for oxygen at higher pH values.

B. Carbon dioxide increases the oxygen affinity of hemoglobin by binding to the C- terminal groups of the polypeptide chains.

C. The oxygen affinity of hemoglobin increases as the percentage saturation increases.

D. The hemoglobin tetramer binds four molecules of 2,3-bisphosphoglycerate.

E. Oxyhemoglobin and deoxyhemoglobin have the same affinity for protons.

Q_{23}:Which out of the followings is not a fibrous protein?

a)Carbonic anhydrase b) Collagen

c) Fibrinogen d) Keratin

Q_{24}:Which one of the following amino acids may be considered a hydrophobic amino acid at physiological p H of 7.4?

A)Isoleucine B) Arginine

C) Aspartic acid D) Threonine

Q_{25}:Which of the characteristics below apply to amino acid Glycine?

A) Optically inactive B) Hydrophilic, basic and charged

C) Hydrophobic D) Hydrophilic, acidic and charged

Q_{26}:Which of the following amino acids in myoglobin, a globular protein, is highly likely to be localized within the interior of the molecule?

A)Arginine B) Valine C) Aspartic acid D) Lysine

Q_{27}:The highest concentration of cystine can be found in:

A) Melanin B) Keratin C) Collagen D) Myosin

Q_{28}:In scurvy, which amino acid that is normally part of collagen is not synthesized?

A)Hydroxy Tryptophan B)Hydroxy Tyrosine

C) Hydroxy Alanine D) Hydroxy Proline

Q_{29}:The structure lost during denaturation of protein is:

A)Primary only B)Primary and secondary

C)Secondary, tertiary and quaternary

D)Quaternary only.

Q_{30}:Secondary structure of protein is stabilized by :

A)Peptide bonds B)Hydrophobic bonds

C)Hydrogen bonds D)Disulfide bonds

Q_{31}:The imino acid found in protein structure :

A)Arginine B)Proline C)Histidine D)Lysine

Q_{32}:The following is a non-protein amino acid:

A)Ornithine B)Homocysteine
C)Histamine D)All of them

Q_{33}:The bonds in protein structure that are not broken on denaturation :

A)Hydrogen bonds B)Peptide bonds

C)Ionic bonds D)Disulfide bonds

Q_{34}:Sickle cell disease results in abnormal hemo globin formation because of a point mutation in DNA that leads to the insertion of which amino acid into b-globin?

A) Glutatmate B) Glutamic acid
C) Tyrosine D) Serine E) Valine

Q_{35}:In β-sheets the hydrogen bonds are per pendicular to the polypeptide backbone

A)True B)False

Q_{36}:Which histidine that reduce myoglobin affinity for CO_2:

A)F_8 B)E_8 C)E_7

Q_{37}: An 80-year-old man presented with impairment of higher intellectual function and alterations in mood and behavior. His family reported progressive disorientation and memory loss over the last 6 months. There is no family history of dementia. The patient was tentatively diagnosed with Alzheimer disease. Which one of the following best describes the disease?

A. It is associated with β-amyloid—an abnormal protein with an altered amino acid sequence.

B. It results from accumulation of denatured proteins that have random conformations.

C. It is associated with the accumulation of amyloid precursor protein.

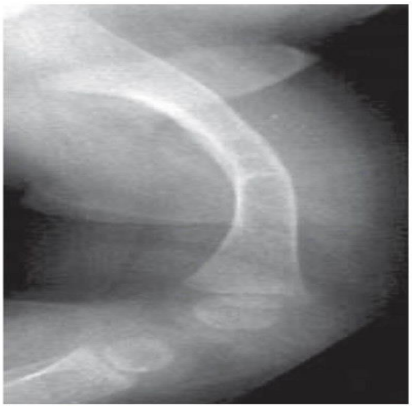
D. It is associated with the deposition of neurotoxic amyloid peptide aggregates.

E. It is an environmentally produced disease not influenced by the genetics of the individual.

F. It is caused by the infectious form of a host-cell protein.

Q_{38}: A seven-month-old child "fell over" while crawling, and now presents with a swollen leg. At age 1 month, the infant had multiple fractures in various states of healing

(right clavicle, right humerus, right radius). At age 7 months, the infant has a fracture of a bowed femur, secondary to minor trauma (see x-ray at right). The bones are thin, have few trabecula, and have thin cortices. A careful family history ruled out nonaccidental trauma (child abuse) as a cause of the bone fractures. The child is most likely to have a defect in:



A. type I collagen.

B. type III collagen.

C. type IV collagen.

D. elastin.

E. fibrillin

Q_{39}: A 7-month-old child "fell over" while crawling and now presents with a swollen leg. Imaging reveals a fracture of a bowed femur, secondary to minor trauma, and thin bones (see x-ray at right). Blue sclerae are also noted. At age 1 month, the infant had multiple fractures in various states of healing (right clavicle, right humerus, and right radius). A careful family history has ruled out nonaccidental trauma (child abuse) as a cause of the bone

fractures. Which pairing of a defective (or deficient) molecule and the resulting pathology best fits this clinical description?

A. Elastin and emphysema

B. Fibrillin and Marfan disease

C. Type I collagen and osteogenesis imperfecta (OI)

D. Type V collagen and Ehlers-Danlos syndrome (EDS)

E. Vitamin C and scurvy

Q_1	D
Q_2	B
Q_3	C
Q_4	C
Q_5	D
Q_6	A
Q_7	C
Q_8	E
Q_9	D
Q_{10}	C
Q_{11}	A
Q_{12}	A
Q_{13}	A
Q_{14}	D
Q_{15}	B
Q_{16}	C
Q_{17}	E
Q_{18}	C
Q_{19}	C
Q_{20}	A
Q_{21}	A
Q_{22}	C
Q_{23}	A
Q_{24}	A
Q_{25}	A
Q_{26}	B
Q_{27}	B
Q_{28}	D

Q_{29}	C
Q_{30}	C
Q_{31}	B
Q_{32}	A
Q_{33}	B
Q_{34}	E
Q_{35}	A
Q_{36}	C
Q_{37}	D
Q_{38}	A
Q_{39}	C

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