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Phone: +442081445350

www.chemistryonlinetuition.com

Email: asherrana@chemistryonlinetuition.com

BIOLOGY

FOUNDATIONS IN BIOLOGY

Level & Board	OCR (A-LEVEL)
TOPIC:	BIOLOGICAL MOLECULES - PROTEINS
PAPER TYPE:	SOLUTION - 1
TOTAL QUESTIONS	07
TOTAL MARKS	/22

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Biological Molecules – Proteins - 1

1.

(a) B

2.

(a) C

3.

(a) B

4.

(a) protein / polypeptide

5.

(a)

U = amino / amine group

And

V = carboxyl / carboxylic acid group

(b) peptide / amide bond and condensation reaction

6.

(a)

Contains non-protein groups

Has prosthetic group

Prosthetic group is iron / Fe ion

Prosthetic group is attached by covalent bonds / ionic interactions / hydrogen bonds

(b)

Proteins / contain polypeptide chains

Contain cysteine / sulphur atoms

Have prosthetic groups / are conjugated proteins

Contain iron ions

(c) Hemoglobin is a larger molecule / has greater molecular mass / has more amino acids

Hemoglobin has quaternary structure / more than one polypeptide chain

Hemoglobin has more than one / four prosthetic groups / iron ions

Hemoglobin contains haem groups

7.

(a)

Difference in primary structure as one amino acid is changed

Amino acid change could cause change to secondary structure

Initial coiling or folding of polypeptide chain alpha helix and beta pleated sheet

Amino acid change could cause change to tertiary structure

Further coiling of secondary structure and ionic bonding and disulphide bonds

Amino acid change has not changed quaternary structure as alpha and beta subunits still able to form haemoglobin in both camel and llama

OR

Llama haemoglobin and camel haemoglobin have differences in their structure due to variations in their amino acid sequences. The primary structure of haemoglobin is determined by the sequence of amino acids in the protein chain. Llamas and camels have evolved different adaptations to their environments, which may have led to differences in their haemoglobin structure.

One possible difference is the presence of specific amino acid substitutions in llama haemoglobin compared to camel haemoglobin. These substitutions can alter the shape and properties of the protein. For example, a single amino acid substitution can affect the oxygen-binding affinity of haemoglobin, influencing its ability to transport oxygen efficiently.

Additionally, the tertiary and quaternary structures of haemoglobin may also differ between llamas and camels. The tertiary structure refers to the folding of the protein chain, while the quaternary structure refers to the arrangement of multiple subunits. Differences in these structures can affect the stability and function of haemoglobin.



I am Sorry !!!!!



DR. ASHAR RANA



Phone: +442081445350
www.chemistryonlinetuition.com
Email: asherrana@chemistryonlinetuition.com

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CONTACT INFORMATION FOR CHEMISTRY ONLINE TUITION

- UK Contact: 02081445350
- International Phone/WhatsApp: 00442081445350
- Website: www.chemistryonlinetuition.com
- Email: asherrana@chemistryonlinetuition.com
- Address: 210-Old Brompton Road, London SW5 OBS, UK