

# Edexcel (A) Biology A-level

## 2.9 + 2.10 - Proteins

### Flashcards

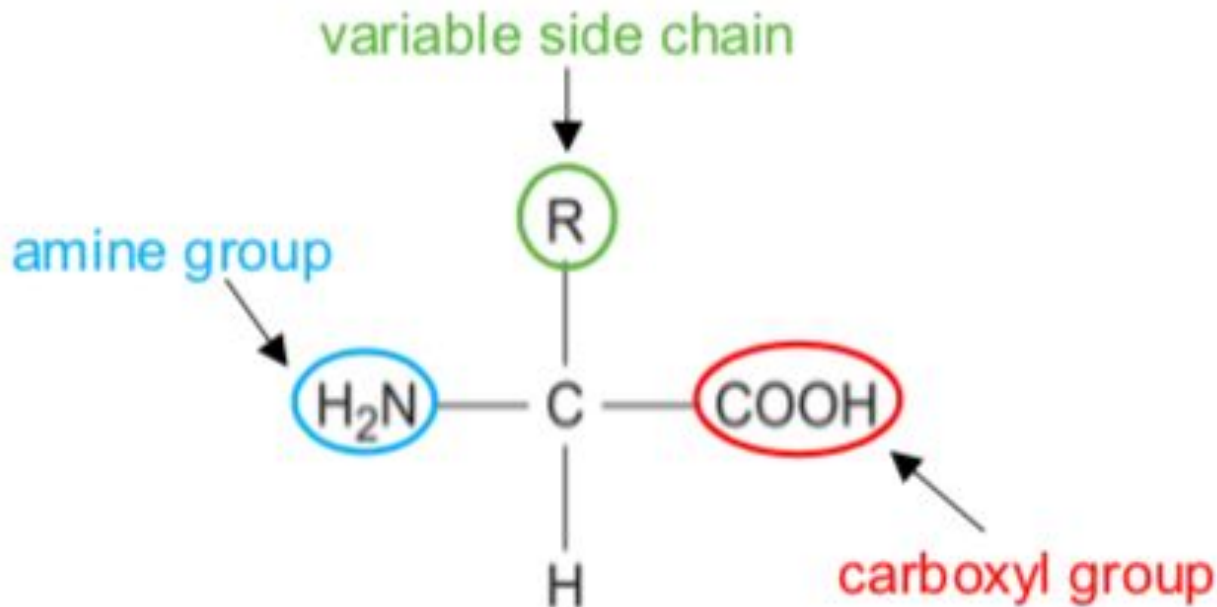
This work by [PMT Education](https://www.pmt.education) is licensed under [CC BY-NC-ND 4.0](https://creativecommons.org/licenses/by-nc-nd/4.0/)



Draw the basic structure of an amino acid.



Draw the basic structure of an amino acid.



# How are polypeptides formed?



# How are polypeptides formed?

Amino acids join together in condensation reactions, forming a peptide bond and eliminating a water molecule.



What is meant by primary, secondary, and tertiary structures of proteins?



# What is meant by primary, secondary, and tertiary structures of proteins?

- Primary = basic amino acid sequence.
- Secondary = whether the polypeptide chain is arranged into a helix or pleated sheet.
- Tertiary = folding of the secondary structure into a complex shape.



How does the primary structure affect the tertiary (3D) structure?





How does the primary structure affect the tertiary (3D) structure?

R group variations produce different bonds. Sulfur atoms form disulfide bridges, oppositely charged groups form ionic bonds. Hydrogen bonds are always present as they occur between hydrogen and nitrogen/oxygen.



Describe how the structure of fibrous proteins relates to their function.



Describe how the structure of fibrous proteins relates to their function.

Long polypeptide chains, folded in parallel. Very little tertiary/quaternary structure aside from cross-linkages for strength. This makes them insoluble, and useful for providing structure.



Give an example of a fibrous protein and explain how its properties relate to its use.



Give an example of a fibrous protein and explain how its properties relate to its use.

Collagen. Hydrogen and covalent bonds make it very strong. Polypeptide chains form a triple helix which creates fibres. This makes it useful in bones, cartilage and other connective tissue.



Describe how the structure of globular proteins relates to their function.



Describe how the structure of globular proteins relates to their function.

Compact, highly folded with complex tertiary/quaternary structures. Soluble, forms colloids in water. They are useful for hormones, antibodies, etc.



Give an example of a globular protein and explain how its properties relate to its use.





Give an example of a globular protein and explain how its properties relate to its use.

Haemoglobin. Water-soluble, with a complex quaternary structure. Contains four haem groups that oxygen can bind to. It is therefore used to carry oxygen in the blood to respiring tissues.



# What are enzymes?



# What are enzymes?

Proteins that act as biological catalysts i.e. increase the rate of a reaction by lowering the activation energy.



# How do enzymes work?



## How do enzymes work?

One area of the enzyme is called the active site, which is specific to a certain substrate. When the enzyme and substrate bind they form a complex, which lasts until the reaction is complete.



What is meant by a 'specific' active site?



What is meant by a 'specific' active site?

The 3D structure of each enzyme is unique due to the side chains and branches that are present. This also makes the active site unique, and therefore only the substrates that match each active site can bind there.



Differentiate between intracellular and extracellular enzymes.





Differentiate between intracellular and extracellular enzymes.

- Intracellular = catalyse reactions inside cells.
- Extracellular = catalyse reactions outside of cells.

