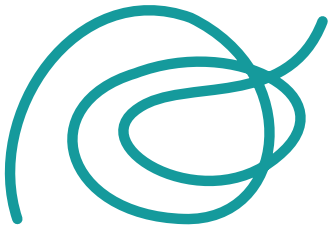
Two broad protein categories

Compare shape, behaviour in water and typical role together. Globular and fibrous describe broad patterns, not different kinds of amino acid or different levels of protein structure.

GLOBULAR



Compact, roughly rounded

FIBROUS



Elongated, strand-like

Shape schematics, not atomic models or a shared scale.

COMPARE	GLOBULAR	FIBROUS
In water	Generally soluble	Generally insoluble
Typical role	Physiological	Structural
Example	Haemoglobin	Collagen

Physiological roles include transport, catalysis and signalling. Structural roles include support, protection and resistance to pulling forces.

Keep the word "generally": these are useful trends, not rules without exceptions.

Supporting reading: OpenStax Biology 2e, 3.4 Proteins.

Scope: Cambridge Biology 9700 syllabus, section 2.3, outcome 4, p. 18.

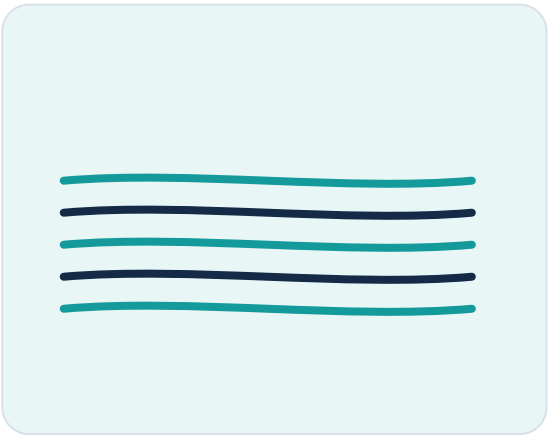
Relate water behaviour to role

Solubility means that protein molecules can disperse in water under suitable conditions. It does not mean the protein has been cut into amino acids or lost its folded structure.

SCHEMATIC COMPARISON IN WATER



Dispersed folded molecules



A persistent fibrous assembly

1. GLOBULAR: INTERACT WITH AN AQUEOUS ENVIRONMENT

Many soluble globular proteins expose polar or charged side chains to water and bury many non-polar side chains. This helps them remain dispersed while keeping a specific folded shape.

2. FIBROUS: RETAIN A DURABLE STRUCTURE

Stable associations within fibrous assemblies help them remain intact instead of dispersing readily. Insolubility suits structures that must stay in place and support tissues in watery surroundings.

Do not explain insolubility by saying "there are no polar groups". Fibrous proteins still contain peptide bonds and may contain polar side chains; overall structure and interactions matter.

Supporting reading: Alberts et al., Molecular Biology of the Cell, protein structure.

Scope: Cambridge Biology 9700 syllabus, section 2.3, outcome 4, p. 18.

Connect each example to its job

Use the category to support a structure-function explanation. Name the protein, identify its role and explain how the relevant properties suit that role.

1. HAEMOGLOBIN: A GLOBULAR TRANSPORT PROTEIN

Haemoglobin is a soluble globular protein inside red blood cells. Its oxygen-binding ability supports oxygen transport. Do not describe it as normally floating freely in blood plasma.

2. COLLAGEN: A FIBROUS STRUCTURAL PROTEIN

Collagen forms tough fibres in connective tissues, including tendons. Its insoluble assemblies and high tensile strength help transmit pulling forces and resist stretching.

3. OTHER ROLES FIT THE SAME BROAD PATTERN

Many enzymes are globular proteins with specific active sites for catalysis. Keratin is a fibrous protein in hair and nails, providing durable structural protection.

FINAL DISTINCTIONS

Globular does not mean "an enzyme": haemoglobin is a transport protein. Fibrous does not mean "unfolded": these proteins have organised structures. Both categories are built from amino acids joined by peptide bonds.

Next: the detailed structure of haemoglobin, then its oxygen-transport function.

Supporting reading: OpenStax Biology 2e, 3.4 Proteins.

Scope: Cambridge Biology 9700 syllabus, section 2.3, outcome 4, p. 18.