Topics 1-4: Biological molecules

	α-helix	β-pleated
Shape	Extended spiral spring (3.6 residues per	Extended zigzag, sheet-like conformation
	turn)	
Formation	 Pp backbone forms repeating helical structure stabilised by intra-chain H bonds btw O atom of nth C=O is H bonded to (n + 4th) NH on the linear sequence 	 stabilised by H bonds btw carbonyl and amine groups of the peptide backbone can occur within the same pp chain(intra) or btw neighbouring pp chains(inter)
Special	 H bonds formed are parallel to main 	Antiparallel/parallel
features	axis of helix	 Aa with bulky R groups cause steric
	 R groups of aa residues project 	hindrance -> aa residues in β -pleated
	outside the helix, perpendicular to	usually have smaller R groups
	the main axis	
Examples	α-keratin	Silk fibroin

	Collagen	Haemoglobin
Shape	Globular	Fibrous
Primary	α-chain, containing 141 aa β-chain, containing 146 aa	 Repeating tripeptide sequence of Glycine-X-Y, where X is often proline and Y is often hydroxyproline/hydroxylysine Each pp chain is >1000 at nextures long Every 3rd residue (glycine) passes through the centre of triple helix
Secondary	 Each pp consists of 8 α helices connected by non-helical argments Stabilized by Hoones Also confering a haem prostbetice 	 A contract of the second se
Tertiary	 Each pp chain is folded such that the hydrophilic aa residues are located at the surface of a subunit while hydrophobic ones are buried in the interior of the molecule -> soluble Allows formation of a hydrophobic cleft to allow the haem prosthetic group (an Fe ion held in a porphyrin ring structure) to bind Each haem group will allow for the binding of 1 molecule of oxygen 	
Quaternary	 Tetrameric 2 pp chains in each dimer(αβ) are held together by hydrophobic interactions, though ionic and H bonds also occur 4 subunits form a spherically shaped molecule held by multiple non-covalent interactions 	 Each collagen molecule consists of 3 α-chains, held by extensive H bonding 3 parallel α-chains wind around one another with a gentle right-handed, rope-like twist to form a tropocollagen, aka right-handed triple helix Bulky proline residues are located on the outside of the triple-helix