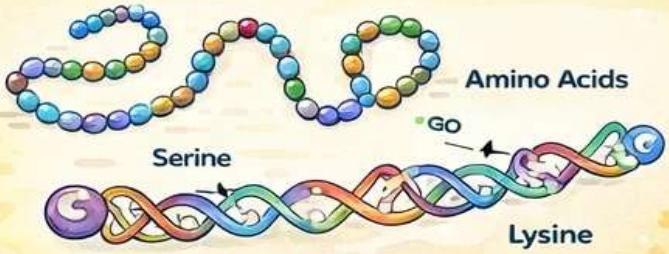
Proteins Revision

PRIMARY STRUCTURE

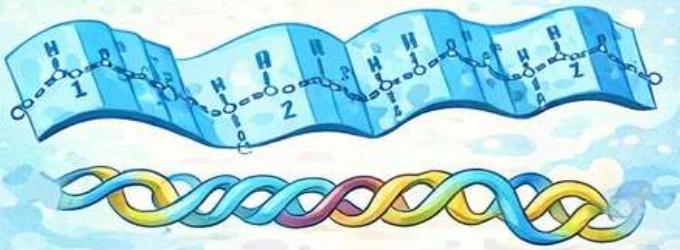
- The **sequerce of AMINO ACIDS** in the **POLYPEPTIDE CHAIN.**
- 20 different amino acids can form infinite kinds of sequences.
- Different properties of the R-Groups determine the overall properties of the protein.



Primary Structure

SECONDARY STRUCTURE

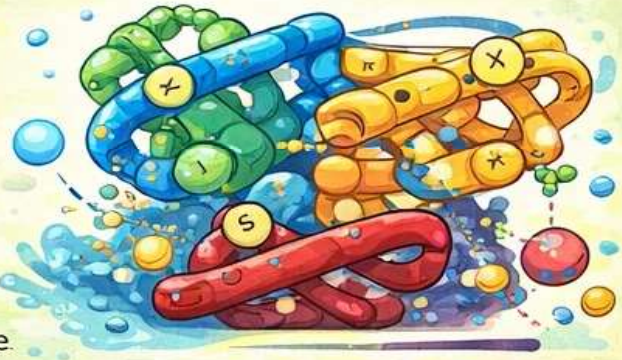
- **ALPHA HELIX** is held together by hydrogen bonds every fourth amino acid forming a spiral.
- **BETA PLEATED SHEET** is held together by hydrogen bonds between adjacent strands forming a zigzag pattern.



Alpha Helix | Beta Pleated Sheet

TERTIARY STRUCTURE

- The specific **FOLDING OF THE POLYPEPTIDE CHAIN.**
- There are **4 POSSIBLE INTERACTIONS** between the **SIDE CHAINS:**
- **HYDROGEN BONDS** - between **H&O**
- **HYDROPHOBIC interactions** – tucked inside, protected from the water
- **DISULFIDE BRIDGES** - where two sulfurs form a bridge.
- **IONIC BONDS** - oppositely charged R-Groups bonding



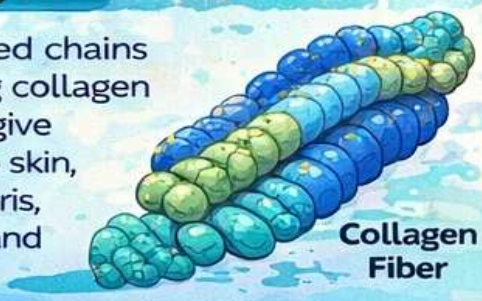
Tertiary Structure

QUATERNARY STRUCTURE

- When **2 or more POLYPEPTIDE CHAINS form ONE LARGE PROTEIN.**
- Many enzymes, hormones and transport proteins (like **Haemoglobin**) are made of multiple polypeptide chains!

Collagen

3 intertwined chains form-strong collagen fibers that give structure to skin, bene, tendoris, ligaments and cartilage.



Hemoglobin

Haemoglobin is a **globular protein made of four polypeptide subunits**, each containing a **haem group with an iron ion that can bind oxygen.**