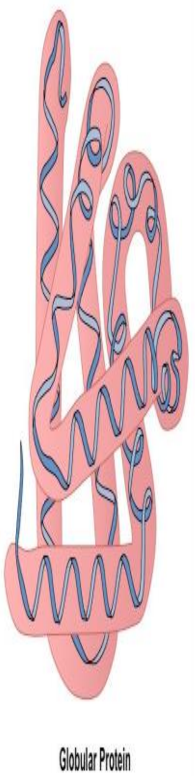


Haemoglobin: It's a **transport** protein. It's an example of a **globular** protein with a **prosthetic** group. It carries **oxygen** from the **lungs** to the tissues. Each haemoglobin molecule can bind with up to **4** oxygen molecules. Consists of **4 subunits (2 called alpha chains and 2 beta chains**) and an **inorganic** haem group **(Fe^{2+})** and a **prosthetic** group. Consists of many **different** amino acids.

Insulin: A **hormone** involved in the **regulation** of blood glucose concentration. Released into the **bloodstream** and transported by the blood. Fit into specific **receptor** on the cell surface **membrane** to have their effect, therefore require a **specific** shape.

Conjugated proteins: This contains a non-**protein** group called **prosthetic** group. This groups can contain **lipids, carbohydrates**, **metal ions** and **molecules** derived from **vitamins**. When combined with lipids or a carbohydrate they from **lipoproteins** or **glycoproteins**. When **metal ions** and **molecules** derived from vitamins are needed for the proteins to carry out their functions they are called **cofactors**.

Catalase: A **quaternary protein** containing **4 haem** groups. Speeds up the breakdown of **hydrogen peroxide** due to the presence of **iron II in the prosthetic group.** Hydrogen peroxide is a common by-product of metabolism, which can accumulate will damage cells and cell component s

Ca^{2+}: Need for **nerve** impulse transmission and **muscle** contraction.

Na^{+}: Needed for **nerve** impulse transmission and **kidney** function.

NH_4^{+}: Needed for production of **nitrate** ions

K^{+}: Needed for *nerve* impulse transmission

H^{+}: Needed for **catalysis** of reactions and **Ph** determination

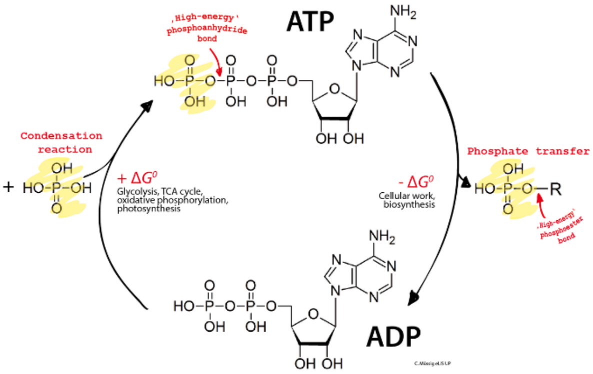
NO_3^{-} : Needed for **nitrogen** supply to **plants** for amino acid and protein fromation

HCO_3^{-} : Needed for maintainance of **blood Ph**

OH^{-}: Needed for **catalysis** of reactions , **acids** and **protein** formation

Cl^{-} : Needed to **balance** charge of sodium and potassium formation

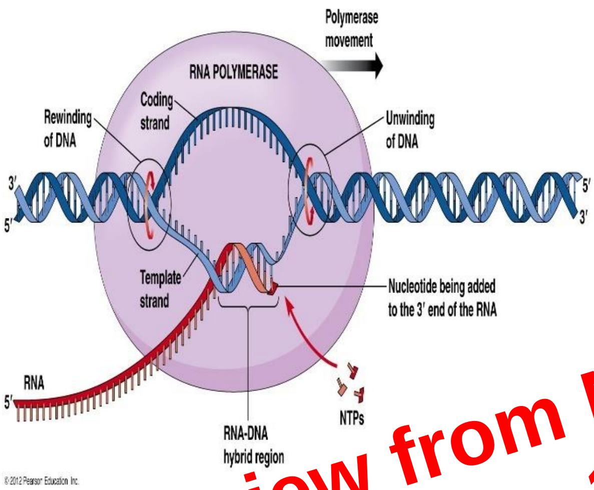
PO_4^{3-} : Needed for cell memebrane formation , **nucleic** acid and ATP formation and bone formation.



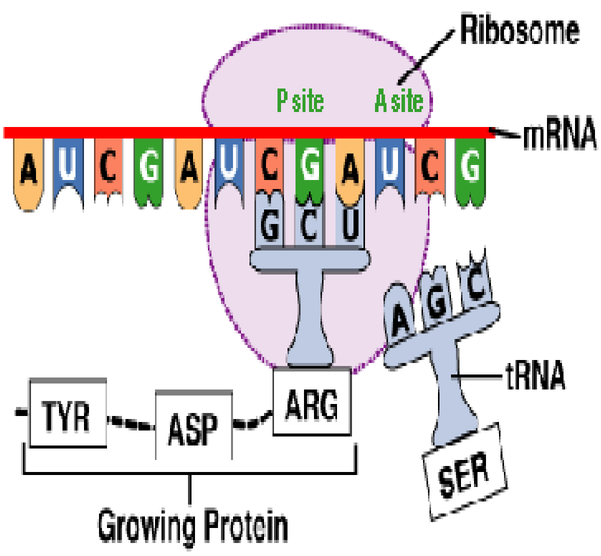
Adenosine triphosphate can supple a **usable** form of energy. Energy is required in cells for synthesis of large molecules, transport, movement.

The structure is a **ribose sugar**, **adenine, 3 phosphates – ATP 2 phosphate – ADP**

Energy is releases approx**. 30.6kjmol^{-1} .**Water is involved in the removal of the phosphate group – hydrolysis reaction .ATP is **unstable** so is not good in long term energy store .Energy released from breakdown of fats and carbohydrates are used to create ATP .ADP is **rapidly** converted to ATP which means large stores are not needed as it is an immediate store of energy .Its small , soluble in water , contains bonds with intermediate energy between **phosphates** , releases small quantities of energy and **is easily regenerated** .



There are **2** processes during protein synthesis the first one is **transcription**. The gene **unwinds** and **unzips** .The enzyme DNA **helicase** catalyses this .The **hydrogen bonds** between the complimentary bases are broken .RNA polymerase catalyses the formation of temporary hydrogen bonds between free nucleotides of RNA found in the **nucleolus** and the unpaired DNA bases .C-G G-C U-A A-T.As the RNA **nucleotides** join together they form **bonds** via condensation reactions and complimentary length of MRNA is formed .The length of RNA is complimentary to the template strand of DNA which means it's a *copy of the coding strand of DNA* .When the end of the gene is reaches the MRNA then passes out of the **nucleus** , through the **nuclear envelope** and attaches to a **ribosome** .



During **translation** a molecule of RNA **binds** to the **ribosome** .Two codons are attached to the **subunit** and exposed to the larger subunit .The first exposed subunit is always **AUG** .Using **ATP** and an **enzyme** , Trna with **anticodon UAC** and the amino acid methionine forms hydrogen bonds with the codon .A second Trna with a **different** amino acid binds to the second codon with its **complementary anticodon** .A peptide bond forms between the two adjacent amino acids .An enzyme present in the small **ribosomal** subunit catalyses the reaction.