Gene and genetic code: The **genetic code** is the set of rules by which information encoded within genetic material ([DNA](https://en.wikipedia.org/wiki/DNA) or [mRNA](https://en.wikipedia.org/wiki/Messenger_RNA) sequences) is [translated](https://en.wikipedia.org/wiki/Translation_%28biology%29) into [proteins](https://en.wikipedia.org/wiki/Protein) by living [cells](https://en.wikipedia.org/wiki/Cell_%28biology%29). The code defines how sequences of nucleotide triplets, called *codons*, specify which amino acid will be added next during [protein synthesis](https://en.wikipedia.org/wiki/Protein_synthesis).

A **gene** is a [locus](https://en.wikipedia.org/wiki/Locus_%28genetics%29) (or region) of [DNA](https://en.wikipedia.org/wiki/DNA) which is made up of [nucleotides](https://en.wikipedia.org/wiki/Nucleotide) and is the [molecular](https://en.wikipedia.org/wiki/Molecular_biology) unit of [heredity](https://en.wikipedia.org/wiki/Heredity)

structure of ATP: ATP consists of a base, in this case adenine (red), a ribose (magenta) and a phosphate chain (blue).



**Nicotinamide adenine dinucleotide** (**NAD**) is a [coenzyme](https://en.wikipedia.org/wiki/Coenzyme) found in all living [cells](https://en.wikipedia.org/wiki/Cell_%28biology%29). The compound is a dinucleotide, because it consists of two [nucleotides](https://en.wikipedia.org/wiki/Nucleotide) joined through their [phosphate](https://en.wikipedia.org/wiki/Phosphate) groups. One nucleotide contains an [adenine](https://en.wikipedia.org/wiki/Adenine) [base](https://en.wikipedia.org/wiki/Base_%28chemistry%29) and the other [nicotinamide](https://en.wikipedia.org/wiki/Nicotinamide%22%20%5Co%20%22Nicotinamide). Nicotinamide adenine dinucleotide exists in two forms, an [oxidized](https://en.wikipedia.org/wiki/Redox) and [reduced](https://en.wikipedia.org/wiki/Redox) form abbreviated as **NAD+** and **NADH** respectively.

Although NAD+ is written with a superscript plus sign because of the [formal charge](https://en.wikipedia.org/wiki/Formal_charge) on a particular nitrogen. atom, at [physiological pH](https://en.wikipedia.org/wiki/Physiological_pH) for the most part it is actually a singly charged [anion](https://en.wikipedia.org/wiki/Anion) (charge of minus 1), while NADH is a doubly charged anion



q. what is globin of Haemoglobin?

the oxygen-carrying component of red blood cells.

a colorless protein obtained by removal of heme from a conjugated protein and especially hemoglobin

Q.Mevalonic acid is the true precursor of terpenes. Draw the strucfure of mevalonic acid.



Q. What are ribozyme?

A **ribozyme** is a ribonucleic acid (RNA) enzyme that catalyzes a chemical reaction. The **ribozyme** catalyses specific reactions in a similar way to that of protein enzymes. Also called catalytic RNA, **ribozymes** are found in the ribosome where they join amino acids together to form protein chains.

Q name one coenzyme each derived from niacin and riboflavin

Ans: NAD (Nicotinamide-adenine dinucleotide) and

FAD(Flavin adenine dinucleotide).

**DETERMINATION OF STRUCTURE OF PROTEINS/POLYPEPTIDES:**

The various steps involved in the determination of structure and analysis of a protein are

1. IR spectrum,2. UV Spectrum ,

3. Amino acid analysis: Proteins are hudrolysed to polypeptide and then simple amino acids.the aminoacids are then separated by chromatography and identified using ir,uv and nmr spectroscopy.

4.Terminal residue analysis:The aminoacid residues at the two ends of a peptide chain are different from all other amino acid residues. N-terminal residue contains a free α-amino group and the C-terminal contain the fre –COOH group.

 

The two N-terminal and C-terminal residues are the identified as follows:

**N-terminal residue analysis:**

a) Sangers method: In this method DNFB is allowed to react with peptide followed by hydrolysis. The DNP derivative is the separated and identified as N terminal amino acid



**C- terminal Residue analysis**:

Hydrazinolysis: It involves the heating of a protein or polypeptide with anhydrous hydrazine. This converts all amino acids except C-terminal into amino sacid hydrazides.



Q. How can you identify the N-terminal amino acid of a peptide?