CSIR NET Life Science Unit 3

Post transcriptional modifications

A set of biological processes common to eukaryotic cells results in an RNA primary transcript which is chemically altered following transcription from a gene to produce a functionally mature RNA molecule is called the post transcriptional changes.

Capping, tailing, splicing are the various steps that occur as part of the post transcriptional modifications.

Capping:

During post-transcriptional modifications, a 7-methyl guanosine cap is added on the 5' end of mRNA.

Functions of the methylated guanosine cap:

- This cap protects the mRNA from degradation by RNases present in the cell, thereby increasing the half-life of mRNA until mRNA is translated outside the nucleus.
- It helps the mRNA for its binding with a smaller subunit of the ribosome during initiation of translation (mRNA-ribosome complexes).
- Cap is also the binding site of many proteins involved in translation. For example, this cap is identified by 18S rRNA and without it translation would not happen.

Tailing:

200-300 Adenylated residues are added on the 3'end of mRNA called the polyA tail.

- Tail also protects the mRNA from degradation by RNases present in the cytoplasm of the cell.
- It also helps in movement of mRN into the cytoplasm.

Splicing:

Splicing is the process of removing introns from the hnRNA and joining of the exons to form a mature mRNA. The introns are removed by SnRNPs (small ribonucleoproteins).