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Ribonucleic Acid

Abbreviation of Ribo nucleic acid

2. RNA(Ribonucleic Acid)

Number of strands present in RNA

The RNA is usually single stranded

List of organisms having RNA other than single strand

except viruses such as TMV, yellow mosaic virus, wound tumor virus, reovirus etc

Arrangement of RNA across it's structure

The single strand of the RNA is folded either at certain regions or entirely to form

Shape of single strand of RNA folded at regions

hairpin shaped structure

Relation of purine and pyrimidine bases in RNA

The RNA dose not possess equal purine-pyrimidine ratio, as is found in the DNA

Location of RNA across the region of cell

It is present in cytoplasm, nucleolus, ribosomes, mitochondria, chloroplast etc.

Like DNA, the

Chemical components building the structure of RNA

RNA is also the polymer of four nucleotides each one contains ribose sugar, phosphoric acid and a nitrogenous base.

Number of purine bases present at RNA

Number of pyrimidine bases present at RNA

List of purine bases present at RNA

List of pyrimidine bases present at RNA

The bases are two purines (A, G) and two pyrimidines (C, U).

Nitrogenous base absent in RNA

Thiamine is not found in RNA.

Expression of pairing of nitrogenous bases in RNA

Pairing between bases occurs as A U and G-C.

Number of nucleotides present in RNA

RNA contains about 70-12000 ribonucleotides

Genetic RNA

If the RNA is involved in genetic mechanism, it is called genetic RNA as found RNA viruses

The DNA acts as genetic material and RNA follows the order of DNA, In such cells the RNA does not have genetic role

Non Genetic RNA

Term for non genetic RNA

Therefore, it is called non-genetic RNA or cellular RNA

The non- genetic RNA is of three types

Number of types of non genetic RNA

List of number of types of non genetic RNA

Messenger RNA

Abbreviation for messenger RNA

1. m-RNA(messenger RNA):

Percentage of space constituted by messenger RNA in the cell

it constitutes about 5% - 10% of the total cellular RNA present in the cell,

Function of messenger RNA

m-RNA carries the genetic information from DNA for Protein synthesis.

Need for messenger RNA to carry genetic information

Contents of messenger RNA

It consists of codons in the form of triplet base sequence.

Arrangement of codons in messenger RNA

Persons coining the term messenger RNA

Jacob and Monod gave the name mRNA.

Number of ends present at messenger RNA

Names of ends present at messenger RNA

Each mRNA two ends called five prime(5') and three prime (3').

Function of cap of messenger RNA

It has a cap for attachment of ribosome in 5 prime and a chain of adenine bearing nucleotides

Function of poly-A tail of messenger RNA

Poly-A tail for more stability and preventing from enzymatic degradation.

Ribosomal RNA

Abbreviation of ribosomal RNA

r- RNA (Ribosomal RNA):

Amount of percentage constituted by ribosomal RNA in the cell

It makes about 80% of the total RNA in the cell.

Major component of ribosomal RNA

It is the major component of ribosome and it helps in attachment of

Function of ribosomal RNA

ribosome with mRNA during protein synthesis.

Event for the attachment of ribosome with messenger RNA in ribosomal RNA

Transfer RNA

Abbreviation for transfer RNA

t RNA (Transfer RNA):

Term for transfer RNA

It is also known as soluble RNA.

Amount of percentage of RNA constituted by transfer RNA in the cell

It forms about 10% - 15% of the total RNA.

Function of transfer RNA

It is used to transfer amino acid molecule to the site of protein synthesis.

Each amino acids has specific tRNA.

Structure of tRNA

Person proposing the clover leaf shape model of RNA

Robert Holley

Year of proposing of clover leaf shape model of RNA by Robert Holley

1965 proposed the

Clover leaf shaped model of tRNA.

Structure of formation of clover leaf shape model of transfer RNA

Formed by the base pairing of 7-9 nucleotides of 5' terminal and 3' terminal.

Nitrogenous base that the 5 prime terminal starts form in clover leaf shape model of transfer RNA

The 5' terminal starts from G and

Sequence of starting of 3 prime terminal in clover leaf shape model of transfer RNA

the 3' ends with a specific sequence of CCA or CCA tail.

The amino acid attaches to the 3' hydroxyl group of the acceptor arm

DHU Loop

Contents of DHU loop in clover leaf shape model of transfer RNA

Structure of arrangement of D arm of DHU loop in clover leaf shape model of transfer RNA

D arm has a stem of 3-4 base pairs

Contents of Loop at the DHU loop in clover leaf shape model of transfer RNA

and it ends in a loop called D loop as it

generally contains dihydrouridine,

a modified nucleotide.

Function of DHU loop in clover leaf shape model of transfer RNA

Helps in maintaining shape and recognition with specific enzymes.

Anticodon Loop

Contents of anticodon loop at clover leaf shape model of transfer RNA

Contents of Stem of anticodon loop at clover leaf shape model of transfer RNA

It has a 5 base pair long stem.

It has an anticodon loop,

Contents of Loop at the anticodon loop at clover leaf shape model of transfer RNA

which contains the complementary codon (3 nucleotides sequence) present on mRNA for the amino acid it carries.

Function of anticodon loop at clover leaf shape model of transfer RNA

It helps on attachment of tRNA with mRNA.

T Psi C Loop

Contents in T Psi C Loop of clover leaf shape model of transfer RNA

Structure of formation of T arm in clover leaf shape model of transfer RNA

The T arm consists of a stem of 4-5 base pairs

Contents of Loop at T Psi Loop of clover shape model of transfer of RNA

and a loop containing pseudouridine, modified uridine.

(binding site for ribosome).

EXTRA ARM: Besides these arms there is an extra arm,

the actual function of extra arm is still unknown