STRUCTURE OF RNA AND ITS FUNCTION

Like DNA,RNA is also made of a long chain of nucleotides.

Some RNA molecules play an active role in cells by catalyzing biological reactions, controlling gene expression, or sensing and communicating responses to cellular signals.

In RNA molecules instead of the base T, base U is found.

Generally three types of RNA molecules are found in the cell – mRNA, rRNA, and tRNA.

MESSENGER RNA: mRNA

It Comprises of only 5% of total cellular RNA.

Messenger RNA (mRNA) carries information about a protein sequence to the ribosomes, the protein synthesis factories in the cell.

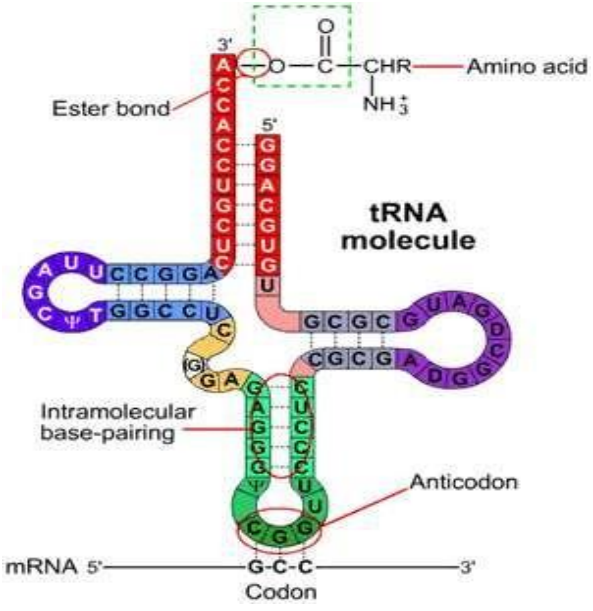
It is coded so that every three nucleotides (a codon) correspond to one amino acid.

The synthesis of mRNA takes place inside the nucleus and after its synthesis, it is exported out where it attaches to ribosomes for protein synthesis. After certain amount of time the message in mRNA is degraded into its component nucleotides.

TRANSFER RNA:tRNA

tRNA represents 15% of total RNA in the cell. Transfer RNA (tRNA) is a small RNA chain of about 80 nucleotides that transfers a specific amino acid to a growing polypeptide chain at the ribosomal site of protein synthesis during translation.

It has sites for amino acid attachment and an anticodon region for codon recognition that binds to a specific sequence on the messenger RNA chain through hydrogen bonding.



STRUCTURE OF tRNA

Anticodon arm:

Made up of three nitrogen bases for recognising and attaching to the codon of mRNA

A-A Binding Site:

It lies at the3' end and has CCA-OH group

TΨC Loop:

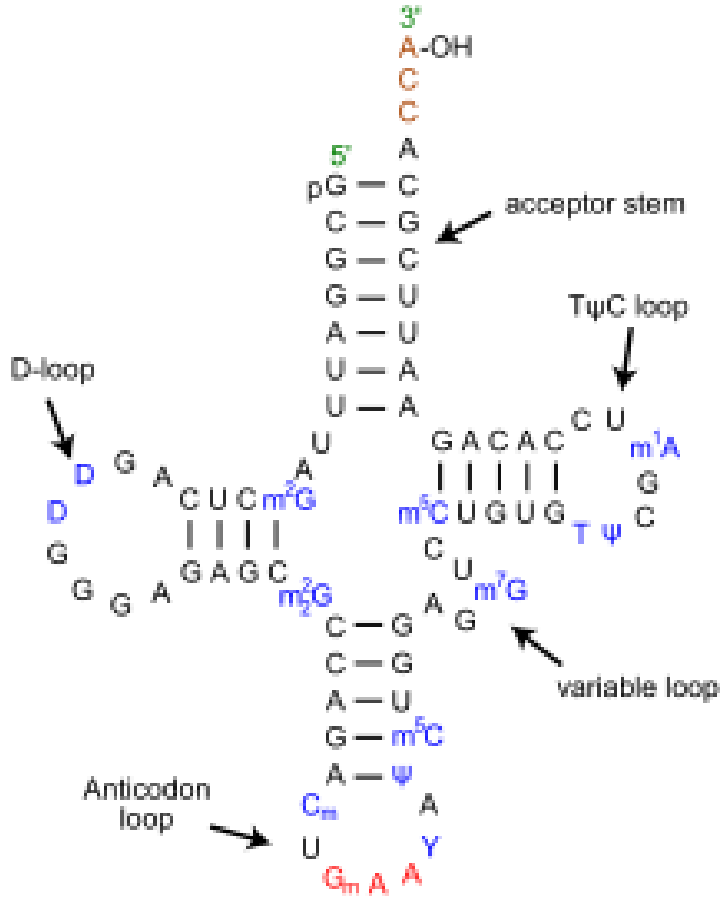
Contains pseudo uridine, site for attaching the ribosomes

DHU Loop:

Contains dihydrouridine, binding site for aminoacyl synthetase enzyme.

Variable loop:

Lies between the anticodon and TΨC loop.



RIBOSOMAL RNA (rRNA):

80% of total RNA in the cells are rRNA. Ribosomal RNA is a constituent of Ribosomes. rRNA are found in combination with several proteins (about 82 proteins) as component of the ribosome which is the site of protein synthesis.

Character	RNA	DNA
Nitrogenous bases	RNA contains adenine, uracil, cytosine, and guanine.	DNA contain adenine, thymine, cytosine, guanine;
Strandedness	RNA is single-stranded.	DNA is double-stranded
Location	RNA can be found in both the nucleus and cytoplasm.	DNA is only found in the nucleus
Functions	RNA carries out protein synthesis. RNA transfers the information to other places in the cell	DNA contains the information for protein synthesis. DNA stores genetic information
Pentose sugar	Hydroxyl group present at 2 carbon of the pentose sugar	Absence of hydroxyl group at 2 C of the pentose sugar