

Ter-elements.

- They serve as binding sites for Tus protein (Tbp)
- It stops helicase activity and shut down replication process.

Types of RNA.

→ RNA is of two types. They are.

1. Genetic RNA.

ex:- TMV, HIV, polio, Influenza.

2. Non-genetic RNA:-

→ It is again of three types.

i. m-RNA

ii. t-RNA.

iii. r-RNA.

i. m-RNA:-

→ m-RNA was named by Jacob & Monod in 1961

→ It is 5% to 10% of the total quantity of RNA.

→ molecular weight of m-RNA is 5×10^6 daltons.

→ m-RNA is formed as a complementary strand from one of the two strands

→ In prokaryotes m-RNA life span is from few seconds to 2 minutes.

→ In prokaryotes m-RNA is polycistronic.

→ In Eukaryotes m-RNA is monocistronic.

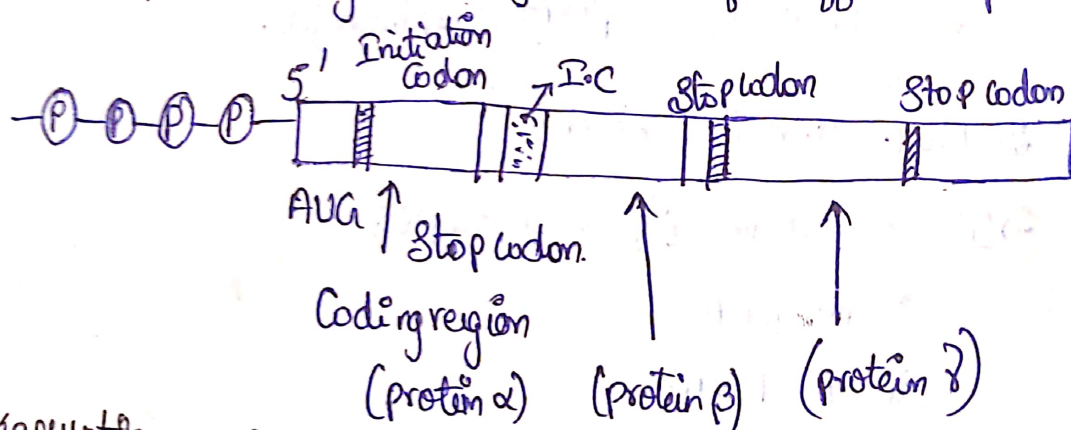
Prokaryotic m-RNA :-

→ Group of coding regions appeared are called operon

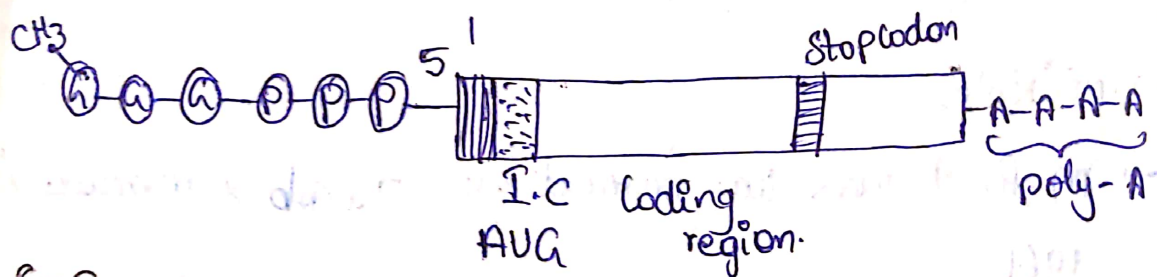
→ The m-RNA's has codes for several proteins.

→ It has no 5' cap region.

→ Ribosomes can bind at many sites in the unlabelled m-RNA, resulting in synthesis of different proteins.



Eukaryotic m-RNA :-



Cap

Cap - 5' Cap is made with methylated Guanine.

It gives protection from exonucleases.

Initiation Codon :-

AUG - Codes for methionine

Coding Region:-

Coding sequences are involved in the coding of (A.As) amino acids.

Stop Codons:-

There are Stop codons which do not code for any (a.a.) amino acids. They are

UAA - Ochre

UAG - Amber

UGA - Opal.

→ m-RNA Contains tail made with Poly-A tail which gives protection from nucleases.

t-RNA:-

→ It is called adapter RNA / Soluble RNA

→ It contains about 10-15% of the total weight.

→ It is composed of 75-95 nucleotides.

→ molecular weight is about 25,000 daltons.

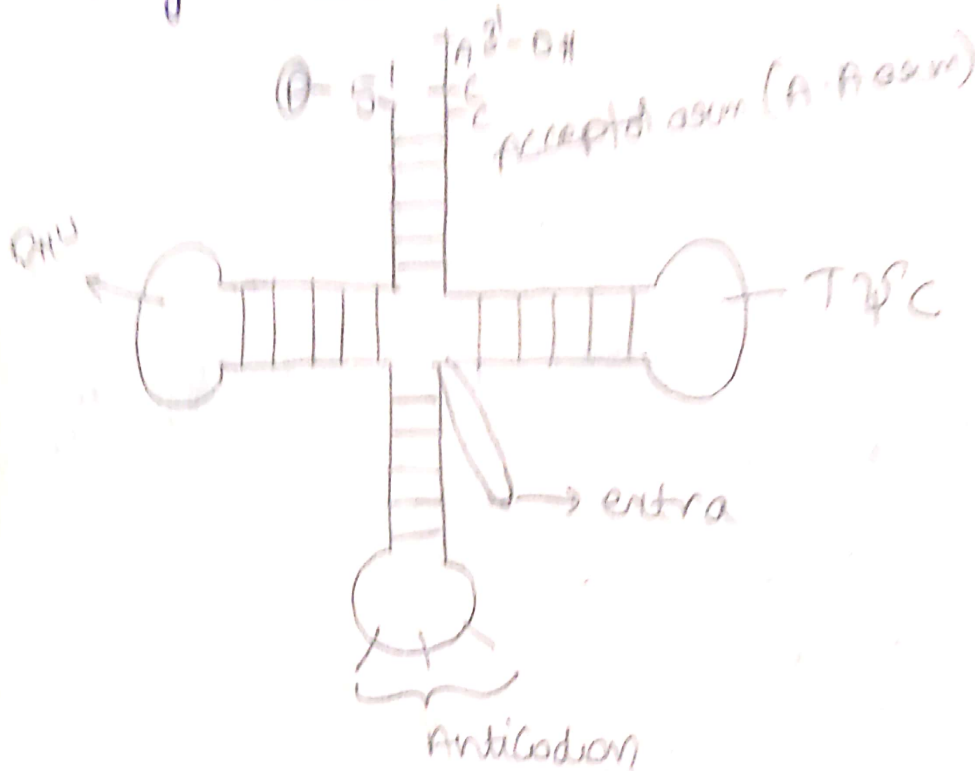
→ It has unusual bases like DHU, ψ , Inosine, Thymine.

→ Holley got nobel Prize as he first determined Alanine-t-RNA of Yeast.

→ He explained 2^o Structure of t-RNA (Clover leaf model)

→ The existence of t-RNA was demonstrated by

"Hoagland and Co-workers".



3b. Structure of t-RNA

- All t-RNA molecules contain the same terminal sequence at 5' & 3' CCA bases. It is amino acid attachment site.
- TΨC (or) thymine arm is present at 3' end side and has 7 unpaired bases. It is involved in binding of t-RNA to ribosomes.
- DHU is having 8-12 unpaired bases. It contains "aminoacyl synthetase".
- Anticodon arm contains triplet which recognises Codons on m-RNA.

→ Some t-RNA contains short, long arms.

Significance :-

→ It participate in protein synthesis.

→ There are 32 different kinds of t-RNA codes for 20 amino acids.

r-RNA (r) Ribosomal RNA / i-RNA :-

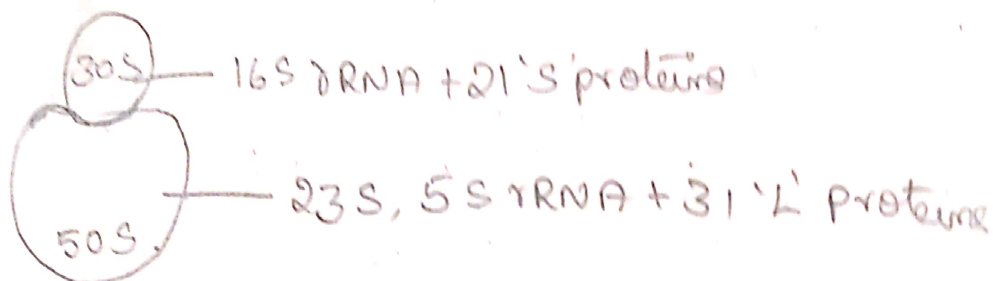
→ It is also called as insoluble RNA.

→ It is primarily found in ribosomes.

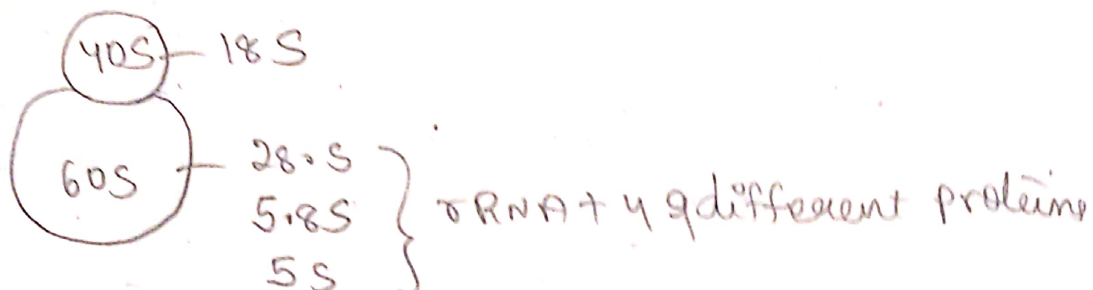
→ The r-RNA contains G-C Content more ^{than} 50%.

→ r-RNA molecule remain stable at upto 2 generations.

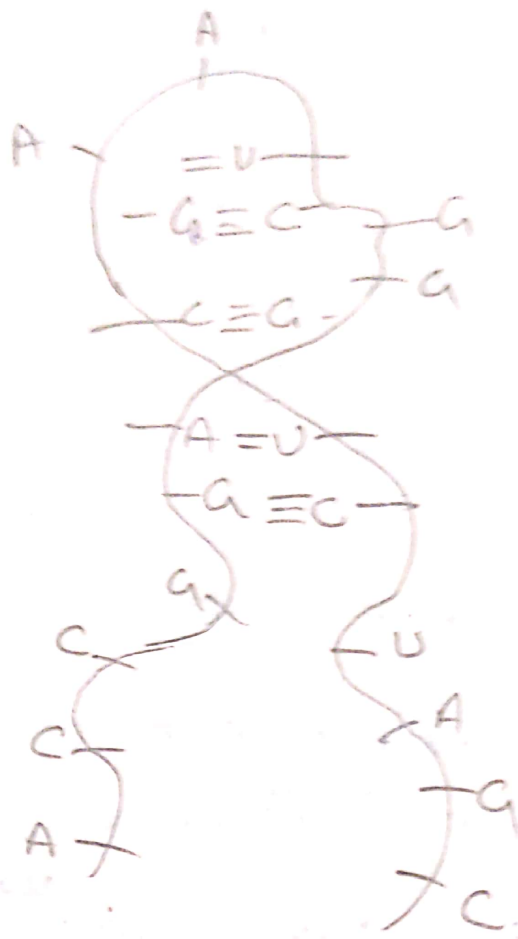
→ Ribosomes composed of 60% rRNA + 40% proteins.



r-RNA in Prokaryotes.



r-RNA in Eukaryotes.



Y-RNA

Prokaryotic & Eukaryotic
Griffith Experiments