rDNA is called nucleolar organiser. In eukaryotes 210-2100 tightly clustered rDNA and bacteria about 10-20 cistron. It involves following steps.

i) Synthesis of rRNA precursor:

rRNA precursor is synthesised on rDNA cistron as short fibril with the help of RNA poly I enzyme. Under e- microscope fibrils appear as chain of christmas tree. The shorter fibrilles located close to initiation point of transcription and the longer fibrils are closest to completion of transcription. The completed RNA fibril called rRNA precursor or pre. transcript

ii) Processing of rRNA precursor: Of the four rRNA molecules three (28S, 18S and 5.8S) are synthesised as first, called pre-rRNA. 5S rRNA is synthesised from a separate RNA precursor outside nucleolus. The pri. transcript for rRNA is a 45S molecule of about 13 Kilobases. 45S rRNA occures in nucleolus and when it is tightly associated with proteins forming ribonucleoprotein particles (RNP).

(S are svedberg unit represents rate of sedimentation or subunits when all ultrafused)

3. Synthesis and processing of 5S rRNA:

5S rRNA is about 120 nucleotide long. It has extranucleolar origin. The rDNA for 5S rRNA located outside the nucleolar organiser. It exhibits tandem arrangement of nucleotide or gene. Process of transcription of 5S rRNA need poly III enzyme and three factor namely TFIIIA, TF IIIB, and TFIIIC.

Function: The fun^n of rRNA is not known but recent evidences suggest that one of the sub units of rRNA serves to release mRNA from DNA.

tRNA: The RNA which possess the capacity to combine specifically with only one amino a. in a reaction mediated by a set amino a specific enzymes called aminoacyl t RNA synthetase Tranfer of amino a from the amino a pool to the site of protein synthesis and recognise the codons of mRNA is known as soluble RNA (SRNA) or transfer RNA (tRNA)

Characteristics of tRNA:

→ tRNA molecules are smallest containing 73 to 93 nucleotides.
→ Each tRNA molecule has 3'-OH terminus and 5'- mono phosphate terminus.

→ Their sedimentation coefficient is 4 S and mol. wt 24,000 to 31,000 daltons.
→ Its polynucleotide chain undergoes sec. and tetel. folding because of internal complementary base pairing. Hence, tRNA molecules occur L shaped 3-d configuration usually twisted as clover leaf. Holley, Khorana and Nirenberg giving Nobel prize b/of clover leaf model of t-RNA.

→ Some of the bases of two arms are coiled over one another.
→ The 3' end of polynucleotide chain ends in Cytosine C base 81, It represent activation of amino a.

→ The base of chain contains 4 N_2 bases constitute as anticodon.

Types: Synthesis of t-RNA:

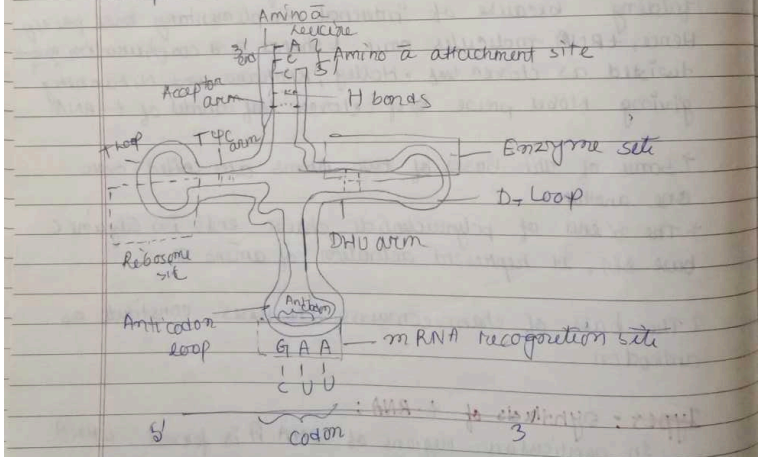
In particular regions of DNA it is found t RNA exhibit complementary in base composition to

particular cistron in DNA at the begining. After the complete tRNA molecule become transcribed from DNA and it is altered through enzyme action. In Drosophila cistron involved 55 and in bacteria about 40-80 gene involved.

Clover-leaf Model of tRNA:

A/c to Clover leaf Model four different regions can be recognised molecule of tRNA. These are:

1. **Amino acid Arm or Acceptor Arm (AA-arm):** It is double helical and stem like. It possess both 5' and 3' end of the molecule in 3' terminal has base triplet CCA with OH at the top. The -COOH group of a specific amino a joins with the -OH grp adenosine base of CCA presence of ATP, forming amino acyl-tRNA. 3' end of acceptor arm is called acceptor end and it is common



2. Anticodon Arm: It is loop like and lies opposite to the AA arm It has ribonucleotides. The N_2 bases of these ribonucleotide are complementary to one of the triplet codon of mRNA. Since, the base triplet on mRNA chain is called codon, Its complementary base triplet on tRNA molecule is termed as anticodon. Anticodon reads appropriate codon on mRNA and binds it so called recognition end.

3. DHU loop (dihydrouridine loop): It is loop like arm. It activate enzyme to binds specific amino a activating enzyme which catalyses specific amino a.

4. TΨC loop: It is loop like arm with a site of attach ment. It is common to all the molecules of tRNA

5. Unusual base Pairs in tRNA: In addition of Cytosine, G, A, U each tRNA molecule has unusual bases, some of them are pseudouridine, inosine a, methylguanine etc. present of tRNA loop help the recognition of aminoacyl tRNA synthetase enzyme By addition of nucleotide Seq. activated RNA molecule from inactivate form, this process is governed by cytidine triphosphate (CTP) and ATP

Function:
→ It plays imp. role in protein synthesis
→ It pick up specific amino a (activated) from cytoplasm and attach itself to ribosome specified by mRNA.
→ It transmit amino a to polypeptide chain.

Other types of RNA:

1. Small Nuclear RNA (or RNAs):
- Found in nucleus of eukaryotic
- It is important for DNA replication, newly trans
called nuclear RNA molecule
- very short, average length 150 nucleotides
- Small RNA
- Molecules are complex with proteins to form ribonucleoproteins and distributed in nucleus, cytoplasm or both

3. Genetic RNA:
- In some viruses, RNA is genetic material - It carry hereditary blue print. In some viruses hereditary RNA is single stranded but others it is double stranded

4. Enzymic RNA: Thomas Cech and Sedney Altman independently discovered certain RNA catalyst as biological catyst called ribozymes. It is associate with maturation of heterogenous RNA.

2019

1. a) The theory of inheritance was proposed by ... and Tatum in 1941

b) left handed helical coiling of DNA molecules characteristics of Z-DNA

Pleotrophic mutation:
It is defined as one gene influence multiple unrelated phenotypic traits. It is given