RNA

RNA, or ribonucleic acid, is a family of biomolecules used to bridge the gap between the genetic code in DNA and functional proteins. One type is mRNA, messenger RNA, which is the template for translation created from DNA. It has a 3' Poly A tail, which is a long sequence of adenine nucleotides at the 3' end, and a 5' cap, a modified guanine nucleotide, to protect the RNA from being damaged unintentionally and by RNases that are looking for uncapped RNA molecules.Ribosomal RNA, or rRNA, is a large component of ribosomes, which are used to catalyze amino acid bond formation. The ribosomes read the mRNA template and join the appropriate amino acids together as the genetic code instructs. The other major type of RNA, tRNA known as transfer RNA, brings those new single amino acids to the ribosome as its 3' tail is bound to an amino acid. It also has an anticodon region so that it can match up to the appropriate codon in the mRNA template.

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Characteristics

mRNA
Mail-(RNA)-rhino

mRNA is messenger RNA, created by RNA polymerase from DNA. It undergoes several post-transcriptional modifications to be fully functional. It functions to convey genetic information from the DNA to the ribosome, working to specify which proteins should be produced by expressed genes.

3' Poly A Tail
(3) Tree Polly with A tail

The 3' end of mRNA has a poly A tail, a long sequence of adenines, to protect it from unintentional damage. This is also called polyadenylation.

5' Cap
(5) Hand Baseball-cap

The 5' end has a modified guanine nucleotide to prevent RNases from breaking down the functional mRNA.

Template For Translation
Temple-plate with Train-lotion

mRNA is used as the template for translation from DNA. Based off of what the DNA strand reads, mRNA transcribes its information, leading to translation of this information into functional proteins.

rRNA
rabbi-Rhino

rRNA is ribosomal RNA, used in the protein synthesis machinery.

Catalyzes Amino Acid Bonds
Putting together Amigo Acidic-lemons with James-Bond

rRNA helps join amino acids together to create a polypeptide chain.

Component of Ribosome Enzyme
rabbi-Rhino growing from Enzyme

rRNA is the largest component of ribosomes by weight. Ribosomes are the enzymes that read mRNA and synthesize polypeptides.

tRNA
transformer-Rhino

tRNA is transfer RNA and is used to match the code in mRNA to appropriate amino acids. tRNA serves as a physical link between the mRNA and the amino acid sequence of proteins.

Anticodon Region

Ant-tie-condom

tRNA has an anticodon region, made up of three nucleotides, that matches with the base codons on mRNA to ensure that the correct amino acid is delivered to the ribosome.

3' Tail Bind To Amino Acid

(3) Tree binding to Amigo Acidic-lemon

The 3' tail of tRNA is bound to the amino acid, which allows for matching of an anticodon region and amino acid.