Biochemistry and Molecular Biology Journal
ISSN: 2471-8084

Open access Commentary

Ribonucleic Acid (RNA) is a Polymeric Molecule Essential in Various Biological Roles

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INTRODUCTION

Ribonucleic acid (RNA) is a polymeric molecule that plays a variety of important biological roles, including regulating the expression, decoding, and coding of genes. Nucleic acids are RNA and deoxyribonucleic acid (DNA). Alongside lipids, proteins, and starches, nucleic acids comprise one of the four significant macromolecules fundamental for all known types of life. Although RNA can be found in nature as a single strand folded over itself rather than as a paired double strand, unlike DNA, it is assembled as a chain of nucleotides. In order to transmit genetic information that directs the synthesis of particular proteins, cellular organisms make use of messenger RNA (mRNA). Some RNA particles assume a functioning part inside cells by catalyzing natural responses, controlling quality articulation, or detecting and conveying reactions to cell signals. Protein synthesis, a universal function in which RNA molecules direct the synthesis of proteins on ribosomes, is one of these active processes. Transfer RNA (tRNA) molecules are used in this process to transport amino acids to the ribosome, where ribosomal RNA (rRNA) joins the amino acids to form coded proteins. The chemical structure of RNA and DNA are very similar, but they differ in three main ways: In contrast to double-stranded DNA, RNA typically performs many of its biological functions as a single-stranded molecule (ssRNA) with significantly shorter nucleotide chains. However, double-stranded RNA (dsRNA) and, moreover, single RNA molecules can form intrastrand double helixes similar to tRNA by pairing complementary bases. Deoxyribose is present in DNA's sugar-phosphate "backbone," whereas ribose is present in RNA. Deoxyribose, on the other hand, does not have a hydroxyl group attached to the pentose ring in the 2' position. The hydroxyl bunches in the ribose spine make RNA more synthetically labile than DNA by bringing down the enactment energy of hydrolysis. Thymine is the complementary base for adenine in DNA, whereas uracil, an unmethylated form of thymine, is the complementary base for adenine in RNA. Self-complementary sequences in the majority of biologically active RNAs, including mRNA, tRNA, rRNA, snRNA, and other non-coding RNAs, allow parts of the RNA to fold and pair with themselves to form double helices, just like DNA does. These RNAs are highly structured, according to analysis. In contrast to DNA, their structures are composed of clusters of short helices packed together to form proteins-like structures. RNAs, like enzymes, are able to perform chemical catalysis in this manner. For instance, the structure of the ribosome, an RNA-protein complex that is responsible for the formation of peptide bonds, revealed that the active site of the ribosome is entirely made of RNA. RNA has a ribose sugar on each nucleotide, with carbons from 1' to 5'. The 1' position is typically occupied by an adenine, cytosine, guanine, or uracil base.

CONCLUSION

Pyrimidines include uracil and cytosine, while purines include adenine and guanine. One ribose's 3' position and the next's 5' position both have phosphate groups attached to them. Since each of the phosphate groups carries a negative charge, RNA is a charged molecule. Between cytosine and guanine, adenine and uracil, and guanine and uracil, hydrogen bonds are formed by the bases. However, other interactions are possible, such as a GNRA tetraloop with a guanine-adenine base pair or a group of adenine bases binding together in a bulge.

ACKNOWLEDGEMENT

The author is grateful to the journal editor and the anonymous reviewers for their helpful comments and suggestions.

CONFLICT OF INTEREST

The author declared no potential conflicts of interest for the research, authorship, and/or publication of this article.

Received:	30-November-2022	**Manuscript No:**	IPBMBJ-23-15403
Editor assigned:	02-December-2022	**PreQC No:**	IPBMBJ-23-15403 (PQ)
Reviewed:	16-December-2022	**QC No:**	IPBMBJ-23-15403
Revised:	21-December-2022	**Manuscript No:**	IPBMBJ-23-15403 (R)
Published:	28-December-2022	**DOI:**	10.36648/2471-8084-8.12.107

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Citation Lu P (2022) Ribonucleic Acid (RNA) is a Polymeric Molecule Essential in Various Biological Roles. Biochem Mol Biol J. 8:107.