

# report

*by* Report Report

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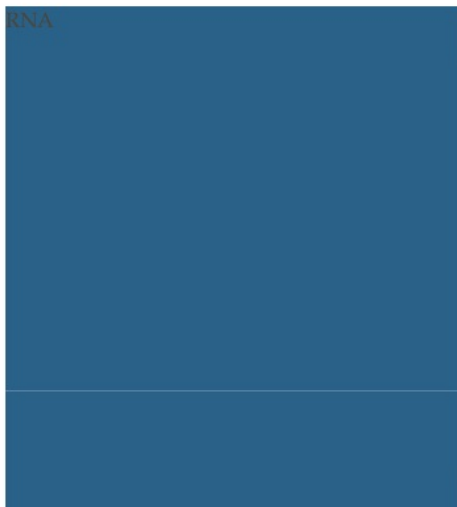
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## RIBONUCLEIC ACID (RNA)

Ribonucleic Acid is a polymeric molecule in biological cells. RNA is involved in protein synthesis, carrying messenger information from DNA and genetic codes in some viruses. RNA is single-stranded, unlike DNA, which is double-stranded. An RNA molecule is made of adenine (A), cytosine (C), guanine (G), and uracil (U).



While RNA is single-stranded, it has self-complementary sequences that cause intrachain base pairing and chains folding into a structure made of bumps and lumps. This structure is important to its function and stability, enabling nitrogenous bases and ribose sugar to be altered by cellular enzymes attaching chemical groups to chain (Han et al., 2017).

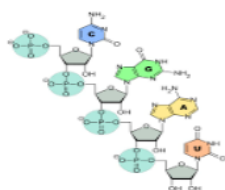
## Types of RNA and their Functions

There are many types of RNA; however, the most common include:

- Messenger RNA (mRNA)
- Ribosomal RNA (rRNA)
- Transfer RNA (tRNA)

These types of RNA are present in all organisms and carry out biochemical reactions. RNAs are involved in protein synthesis and regulatory processes in the cells. During the process of protein synthesis, genetic codes are transferred from the nucleus to ribosomes by messenger RNA. In the ribosomes, protein is translated (Han et al., 2017). The ribosomes are made up of proteins and rRNA. The ribosome proteins are encoded and synthesized in the nucleolus. The protein is transferred to the cytoplasm, where it is translated. Nitrogenous bases present in the mRNA identify the makeup of particular amino acid in the sequence of the nitrogenous bases.

## RNA

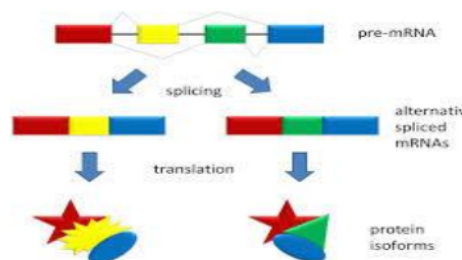


tRNA then transfers the amino acids to the ribosomes. In the ribosomes, the amino acids are attached to create proteins. RNAs are also categorized into coding and non-coding RNA.

## RNA and Disease

Cellular functions often depend on the protein-coding and non-coding RNAs and the binding proteins connected with them that form ribonucleoprotein complexes (RNPs). Changes or variations that alter RNA, RNPs, or components required for their assembly can be harmful. Alternative coding or processing gives cells the capacity to change their proteome and transcriptome in response to instruction.

Splicing relies on various RNA binding proteins, a complex code, and a network of interactions, therefore, increasing exposure to alterations and misregulation that cause disease.



Finding disease-causing mutations or alterations in RNA is providing crucial information on new areas that can be targeted by treatment and providing an understanding of the RNA biology, therefore, allowing for developing new RNA based tools for therapeutics and treatment (Wild & Tabrizi, 2017). RNA molecules are fundamental in most of the cellular processes occurring within the cell. They are essential as they ensure proper cell functioning and survival.

However, the intricate network of interaction in the cells cause mutations that are major causes of human disease. While mutation or disruption of RNAs and RNPs functions are the cause of many human diseases, it also provides opportunities for therapies and tools for human disease treatment. FNA and RNPs often provide a therapeutic target than the defective proteins that they encode.

Understanding RNA and its functions are important for healthcare professionals to know how the disease develops and various therapeutic targets.

## References

- Han, D., Qi, X., Myhrvold, C., Wang, B., Dai, M., Jiang, S., ... & Yin, P. (2017). Single-stranded DNA and RNA origami. *Science*, 358(6369).
- Wild, E. J., & Tabrizi, S. J. (2017). Therapies targeting DNA and RNA in Huntington's

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