

Study on structure and function of regulatory RNA elements regulating gene.

Yang Eric*

School of Life Sciences, Tsinghua University, Beijing, China

Abstract

Gene expression or regulation of gene expression which mostly includes a wide range of mechanisms which are used by the cells to increase or decrease the production of gene products like protein or RNA. Regulation of gene is mostly essential for the eukaryotes, prokaryotes and viruses as it increases the adaptability and variability of an organism which allows the cell to express protein when necessary.

Key Words: Gene Expression, RNA, Protein, DNA

Accepted on 17 April, 2021

Description

In many of the multicellular organisms, the regulation of the genes drives the morphogenesis and cellular differentiation in the embryo which leads to the creation of various cell types which possess different gene expression profiles from the same genome sequence. RNA is a polymeric molecule which is necessary in many of the biological roles like decoding, coding, regulation and expression of genes.

Discussion

DNA and RNA are nucleic acids along with carbohydrates, proteins, lipids which constitute one of the four major essential macromolecules which are necessary for all the known forms of life. RNA and DNA are majorly assembled in a chain which consists of nucleotides, but unlike DNA. RNA is mostly found in a nature of single strand folded itself rather than a pair of double strand. Each of the nucleotides which is present in RNA mostly contains ribose sugars, purines, pyrimidine's. For the synthesis of RNA is mostly catalysed by an enzyme which is RNA polymerase which uses the DNA as a template. Transcription is a process which synthesizes the RNA. The earliest regulators of the regulation of genes were proteins which are also known as repressors and activators. There are many several kinds of processes of RNA dependent in eukaryotes which helps in the regulation of the gene expression at various points such as long non-coding RNAs which are the shutting down blocks of chromatin epigenetically, RNAi repressing genes post transcriptionally and enhancer RNAs which induces the increase of gene expression. When the DNA is transcribed and it was formed into mRNA so there must be some sort of regulation on the amount of mRNA which is translated into proteins. The process of translation of mRNA into proteins is known as post transcriptional regulation. Many numbers of mechanisms are used to control the translation process of mRNA mostly at the level of initiation. RNA is a single stranded molecule which is unlike DNA. In many of its biological roles RNA mostly consists of shorter chains of nucleotides.

Conclusion

RNA consists of ribose as a sugar phosphate as a backbone. Mostly the biological RNAs consists of mRNA, tRNA, rRNA, snRNAs, and some other non-coding RNAs which contains the self-complementary sequences which allows the parts of RNA to fold and pair with itself to form double helicals. The phosphate groups are negatively charged and makes the RNA as a charged molecule. RNA will only transcribed with the four bases like adenine, guanine, uracil and cytosine. The single stranded RNA molecules functions in the form of just like proteins and frequently requires a specific tertiary structure.

References

1. Novick R P, Ross H F, Projan S J, et.al. Synthesis of staphylococcal virulence factors is controlled by a regulatory RNA molecule. *The EMBO journal*. 1993;12(10):3967-75.
2. Huang H Y, Chien C H, Jen K H, et.al. RegRNA: an integrated web server for identifying regulatory RNA motifs and elements. *Nucleic acids research*. 2006; 34(2): 429-34.
3. Papenfort K, Vogel J. Regulatory RNA in bacterial pathogens. *Cell host & microbe*. 2010;8(1):116-27.
4. Berghoff B A, Hoekzema M, Aulbach L, et.al. Two regulatory RNA elements affect T is B-dependent depolarization and persister formation. *Molecular microbiology*. 2017;103(6):1020-33.
5. Scott W G, Martick M, Chi Y I. Structure and function of regulatory RNA elements: ribozymes that regulate gene expression. *BBA-Genes Regulatory Mechanisms*. 2009;1789(10):634-41.

*Correspondence to

Dr. Yang Eric

School of Life Sciences

Citation: Eric Y. Study on structure and function of regulatory RNA elements regulating gene. *J Mol Oncol Res* 2021;5(4):24-5.

Tsinghua University

Beijing

China

E-mail: yang.eric@126.com