

# DNA: Structure, Constitutes and Importance

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## INTRODUCTION

DNA is the genetic material present in each and every individual every cell carries the genetic information; DNA is very unique and specific to each and every person. Most the DNA is present in the nucleus of the cell. DNA is usually double stranded; in case of any denaturation single stranded DNA is formed. Denaturation is caused by high temperature, the temperature at which 50% of the DNA gets converted into single stranded single is called as Melting temperature of the DNA. The stability of the DNA depends on the chain length, the longer the chain the more is the stability and the percentage of Guanine and cytosine.

DNA has two polynucleotide chains coiled over other which results in the double helical structure of it, the chains consist of ribose sugar attached by phosphate group and nucleotide attached in it. The nucleotides are of 2 types' purines and pyrimidines. Adenine and Guanine come under purines, Thymine and cytosine are pyrimidines and purines form bonds with pyrimidines. The Adenosine binds with Thymine by two hydrogen bonds; Guanine binds with Cytosine by three hydrogen bonds. So the percentage of relative purines and pyrimidines in always equal.

A DNA replicates by itself, initially the double stranded DNA gets separated and the single helix of the coil is used for the replication, with the help of m-RNA, the complementary base pairs base pairs are arranged and the other strand of the DNA gets ready. The DNA strands are separated by the enzyme.

DNA helicase and further the coding of the gene takes place and later with the help of DNA polymerase the DNA chain gets elongated and then when the replicated is completed then the process is terminated using the stop codon. The DNA exists in three forms they are A-DNA, B-RNA, Z-RNA. The enzymes

are helpful in the replication of the DNA are nucleases, ligases, topoisomerases, helicases and polymerases.

DNA has a wide range of applications in the modern world, as it has many applications on several fields. The DNA of an organism can be isolated and purified later it is processed with a m-RNA to produce new genes, this procedure is followed and many genes are synthesized artificially by providing the required external environmental conditions, some of the examples of such products are plasmids, vector DNA, cosmids. These have a wide application in the biotechnology and medicine; it is mainly used in insulin production genes. The DNA is negatively charged because it consists of phosphate group and this helps it to get draped around the positively charged histones.

DNA also plays a vital role in Forensic purposes. The DNA of every individual is different and unique expect in the case of identical twins. The DNA is present in present in each and every part of the body like skin, blood, hair etc., this is used to in identification purposes in case of crimes or any other accidents. New techniques are developed to test the DNA of the foetus when the still in the womb of mother.

Ergonomics is very essential as a person needs to perform work or occupation in order to get his bread, so one should not get sick doing it and ergonomics ensures it.

## CONFLICT OF INTEREST

We have no conflict of interests to disclose and the manuscript has been read and approved by all named authors.

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