

Polymorphic DNA

DNA is the genetic material. The genetic material should have the following characteristics.

1. It should have a stable state.
2. It is capable of replication.
3. It should have the capacity for carrying information

DNA exists in several forms and they occur in several environmental conditions. The alternate forms of DNA are B-DNA, A-DNA and Z-DNA. The process called polymorphism of DNA.

B-DNA

Watson and Crick proposed the double helix structure of DNA. B-DNA is the normal DNA. According to Watson and Crick DNA is composed of two polynucleotide chains. It is made up of nitrogenous bases, sugar and phosphate. Nitrogenous bases include purines and pyrimidines. The polynucleotide chains are arranged as a double helix in the $3'5'$ direction.

The number of base pairs in one turn is 10 in B-DNA. The helical diameter is 20\AA and the rotation per angle is 34\AA .

A-DNA

It is very similar to B-DNA. It is a right-handed helix. It is wider than B-DNA. Number of base pairs is 12 per turn. The helical diameter is 21\AA and the rotation angle is 34.3\AA .

Z-DNA

It is a left-handed DNA, there are 10 base pairs per turn. The helical diameter is 18\AA and rotation angle is 30\AA .

The polynucleotide chains are arranged in Zig-Zag manner. Z-DNA is inverse of A-DNA in respect of grooves. The minor groove is wide and the major groove is flattened or absent

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