DNA

DNA is a macromolecule that forms a double helix structure in the cells (mostly in the nuclei and mitochondria) of living organism. The DNA molecule is considered the genetic material of all living cells. It is present in bacteria, protists, fungi, plants and animals. DNA is responsible for determining the specific characteristics of an organism.

DNA: The Genetic Material

Scientists now know that the genetic material is DNA (Deoxyribonucleic acid). Modern research techniques helped scientists to answer many questions about DNA and heredity. The work of earlier scientists gave Watson and Crick a lot of information about DNA. By the end of the 1940's, scientists had found that DNA consists of long strands of nucleotides. Each nucleotide contains a pentose sugar called deoxyribose, a phosphate group, and one of the four compounds called nitrogenous bases.

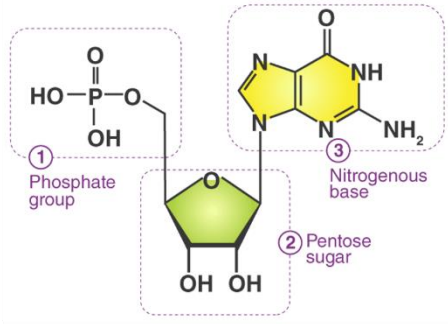

Figure 6. Structure of a nucleotide

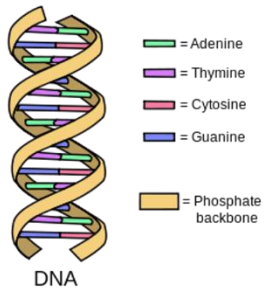

Figure 7. Double helix structure of DNA

Key Concepts

DNA is composed of chains of nucleotides built on a sugar and phosphate backbone and wrapped around each other in the form of a double helix. The backbone supports four bases: guanine, cytosine, adenine, and thymine. Guanine and cytosine are complementary, always appearing opposite each other on the helix, as are adenine and thymine. This is critical in the reproduction of the genetic material, as it allows a strand to divide and copy itself, since it only needs half of the material in the helix to duplicate successfully.