

DNA and RNA Structures

Nucleic Acid The nucleic acids are the building blocks of living organisms. They are molecules that allow organisms to transfer genetic information from one generation to the next. They are the polynucleotides having high molecular weight. The monomeric unit of which is nucleotide. All the types of NA's work together to help cells replicate and build proteins.

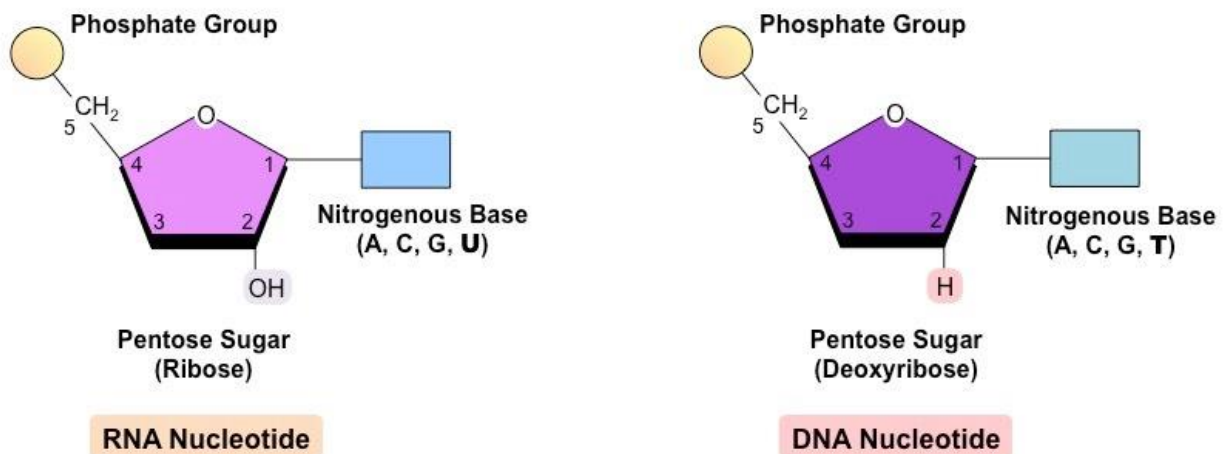
Types of Nucleic Acids:

- 1) Deoxyribonucleic acid (DNA).
- 2) Ribonucleic Acid (RNA).

The structure of nucleotides

DNA is a polymer made of repeating subunits called nucleotides. Nucleotides have three parts: a simple sugar, a phosphate group, and a nitrogenous base. The simple sugar in DNA, called deoxyribose, gives DNA its name deoxyribonucleic acid.

A nitrogenous base is a carbon ring structure that contains one or more atoms of nitrogen. In DNA, there are four possible nitrogenous bases: adenine (A), guanine (G), cytosine (C), and thymine (T). Thus, in DNA there are four possible nucleotides, each containing one of these four bases.

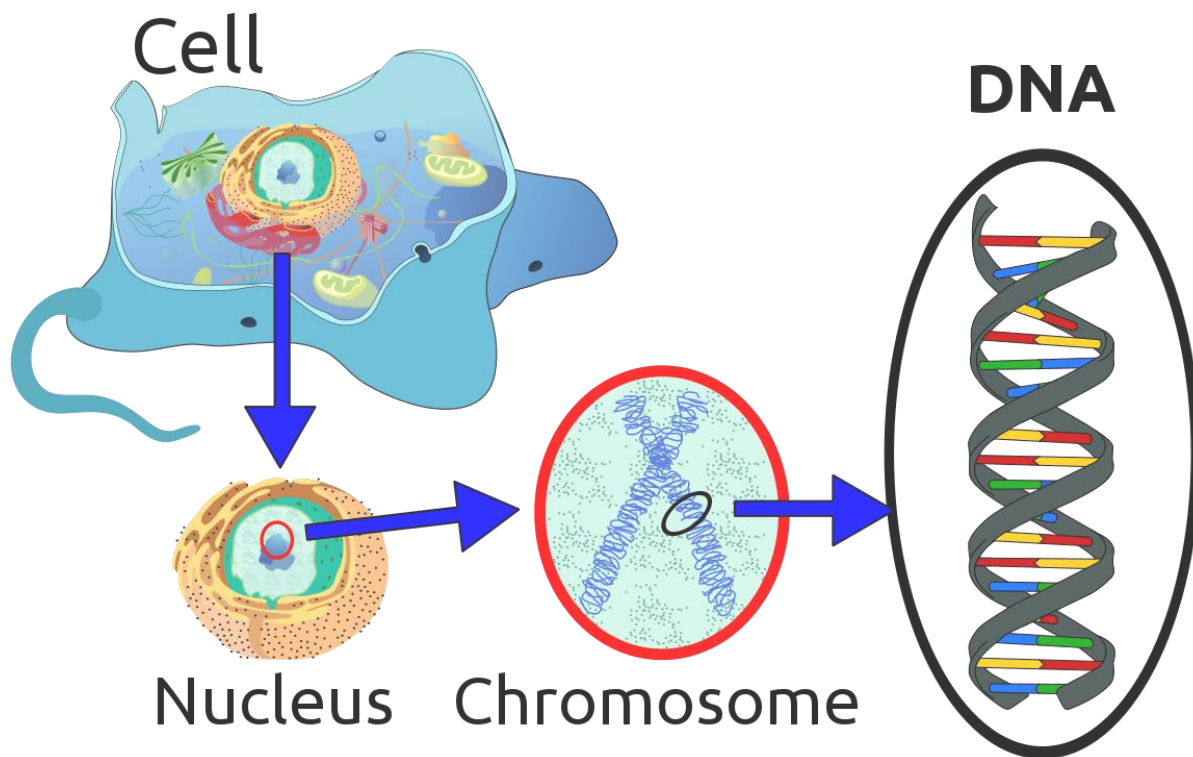


DNA Definition

DNA (deoxyribonucleic acid) is a type of macromolecule known as a nucleic acid. It is shaped like a twisted double helix and is composed of long strands of alternating sugars and phosphate groups, along with nitrogenous bases (adenine, thymine, guanine and cytosine).

DNA Location

DNA is organized into structures called chromosomes and housed within the nucleus of our cells.

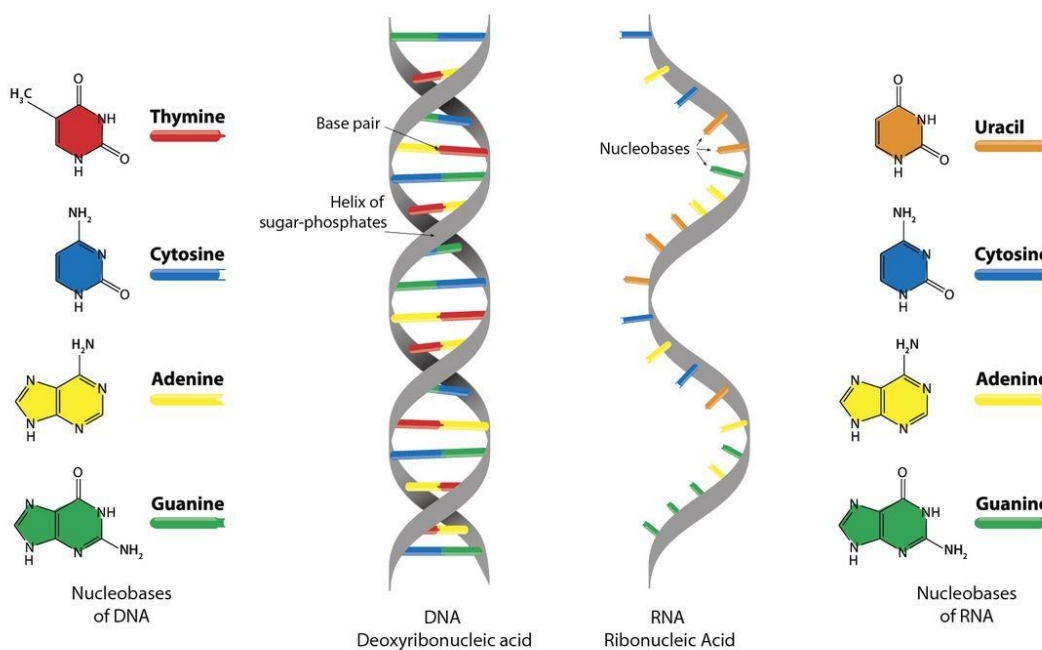


Function of deoxyribonucleic acid (DNA)

- 1- Give genetic instruction.
- 2- DNA stores information to tell cells how to function, passing it on to the next generation of life through cells. It also helps in development.

DNA Structure

Watson and Crick proposed that DNA is made of two chains of nucleotides held together by nitrogenous bases. Hydrogen bonds can form only between certain bases, so the bases on one strand determine the bases on the other strand. Specifically, adenine on one strand pairs only with thymine on the other strand, and guanine on one strand pairs only with cytosine on the other strand. Crick also proposed that DNA is shaped like a long zipper that is twisted into a coil like a spring. When something is twisted like a spring, the shape is called a helix. Because DNA is composed of two strands twisted together, its shape is called a double helix.



RNA

RNA, like DNA, is a nucleic acid. RNA structure differs from DNA structure in three ways.

- First, RNA is single stranded (it looks like one-half of a zipper) whereas DNA is double stranded.
- Second, the sugar in RNA is ribose; DNA's sugar is deoxyribose.

Differences between DNA and RNA

RNA	DNA
Single stranded	Double stranded
Ribose is the main sugar	The sugar is deoxyribose
adenine (A), guanine (G), cytosine (C), Uracil (U)	adenine (A), guanine (G), cytosine (C), and thymine (T)