Topic:DNA (or deoxyribonucleic acid)

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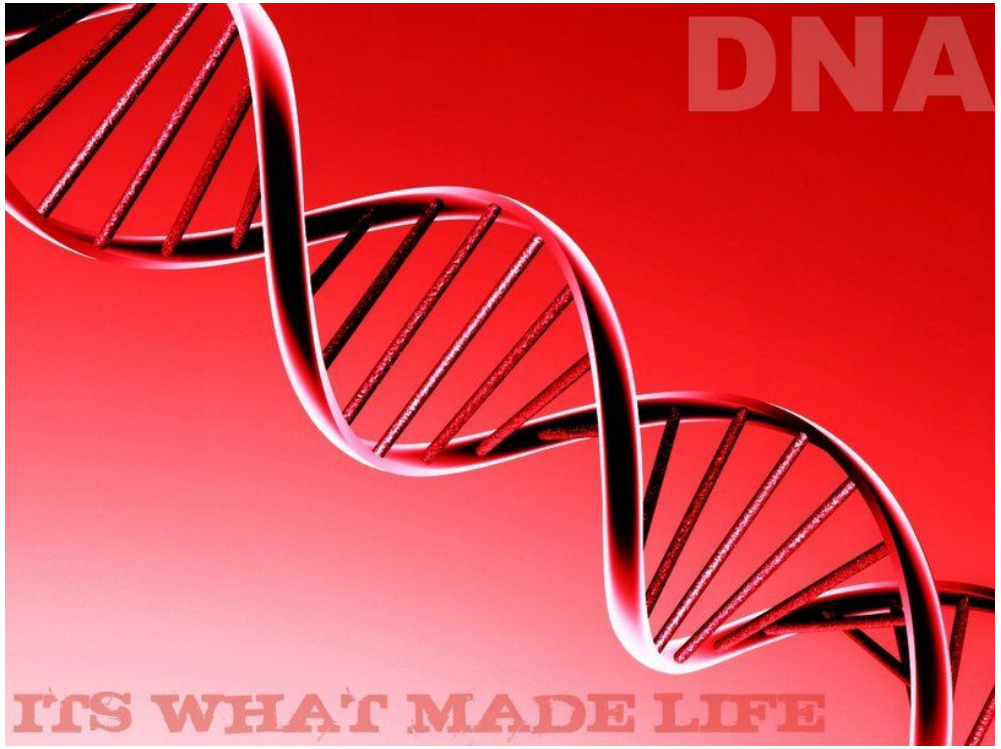


DNA (or deoxyribonucleic acid) is the molecule that carries the genetic information in all cellular forms of life and some viruses. It belongs to a class of molecules called the nucleic acids, which are polynucleotides - that is, long chains of nucleotides.

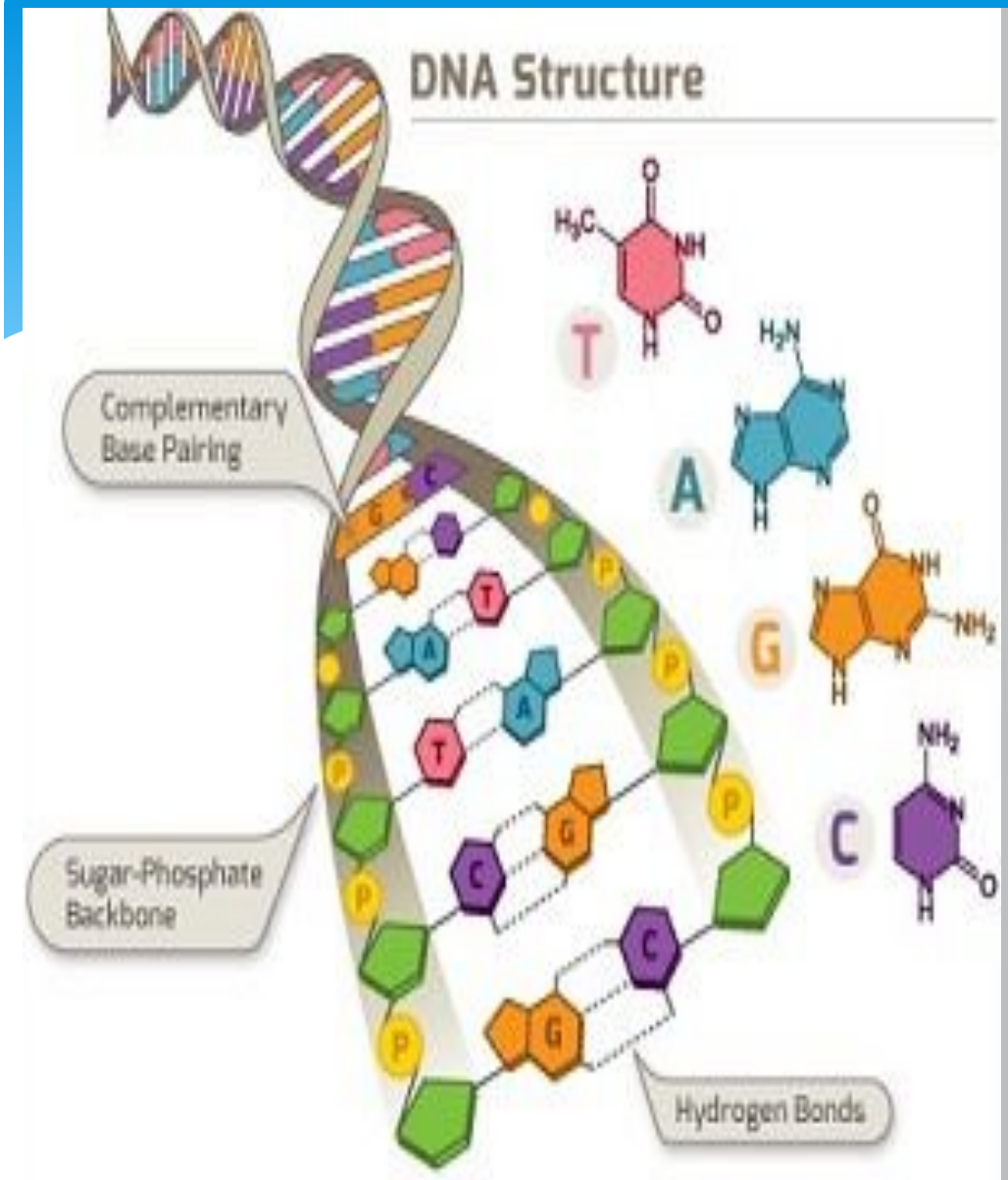
Each nucleotide consists of three components:

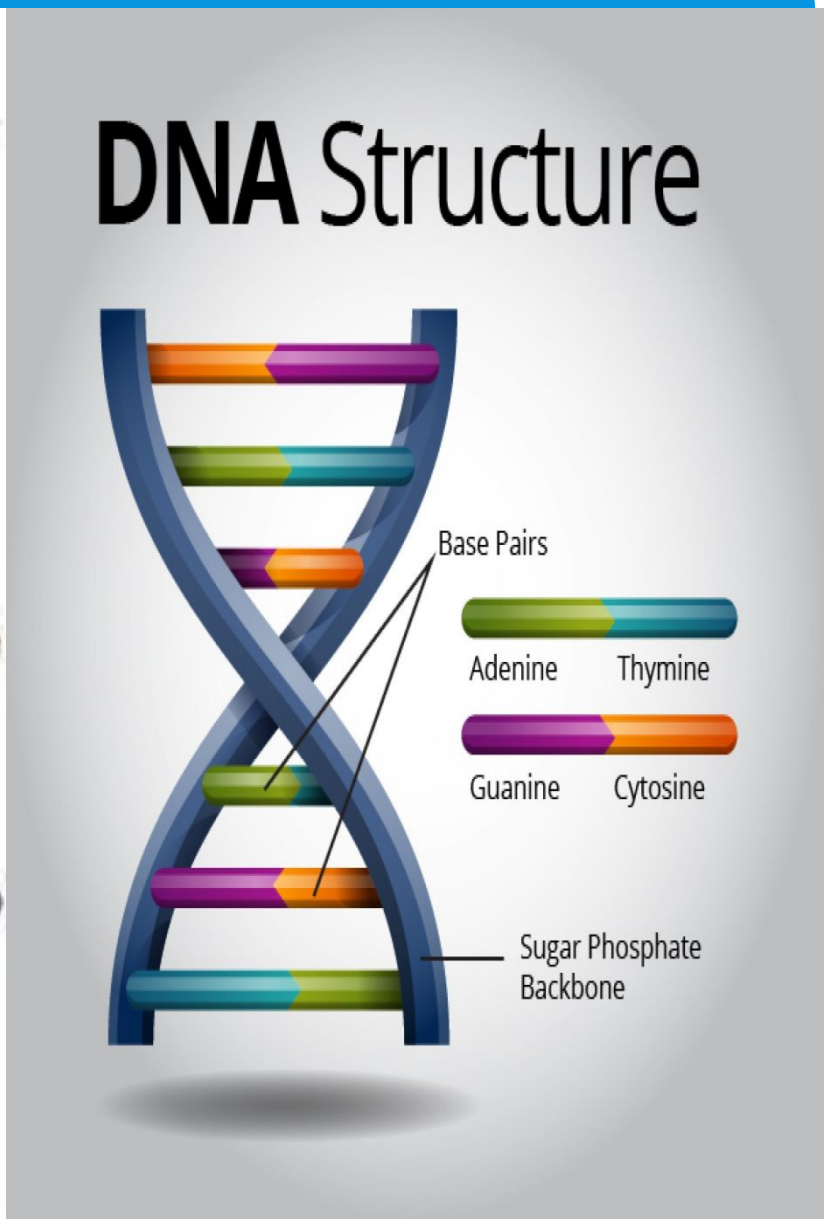
•a nitrogenous base: cytosine (C), guanine (G), adenine (A) or thymine (T)

•a five-carbon sugar molecule (deoxyribose in the case of DNA)

•a phosphate molecule

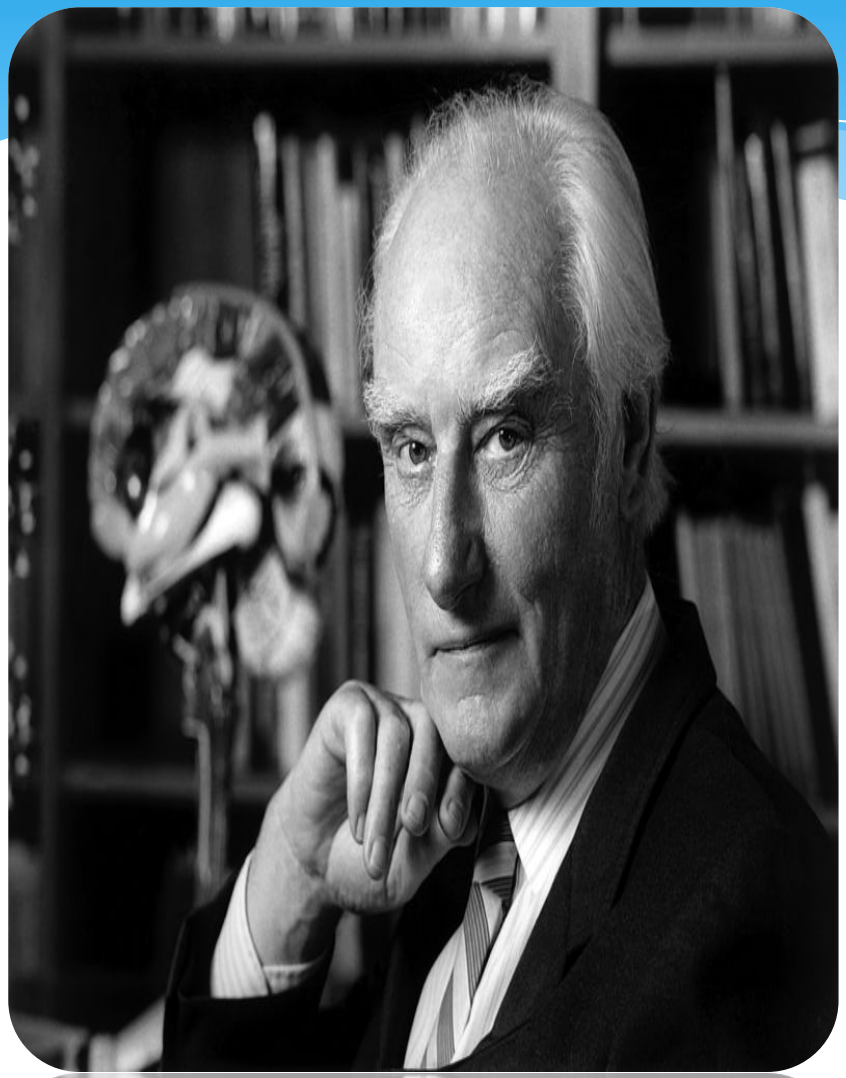
Within cells, DNA is organized into long structures called chromosomes. During cell division these chromosomes are duplicated in the process of DNA replication, providing each cell its own complete set of chromosomes. Eukaryotic organisms (animals, plants, Gribova protists) store most of their DNA inside the cell nucleus and some of their DNA in organelles, such as mitochondria or chloroplasts.In contrast, prokaryotes (bacteria and archaea) store their DNA only in the cytoplasm. In chromosomes, chromatin proteins such as histones compact and organize DNA. These compact structures guide the interactions between DNA and other proteins, helping control which parts of DNA are transcribed.


DNA Structure
Complementary Base Pairing
Sugar-Phosphate Backbone
Hydrogen Bonds
T
A
G
C


DNA Structure
Base Pairs
Adenine
Thymine
Guanine
Cytosine
Sugar Phosphate Backbone

The structure of the DNA double helix was proposed by Francis Crick and James Watson in 1953, on the basis of x-ray diffraction data obtained by Maurice Wilkins and Rosalind Franklin, and "rules of Chargaff", according to which each DNA molecule adhered to a strict ratio linking the number of nitrogenous bases of different types. Later proposed by Watson and Crick model of DNA structure was proven, and their work awarded with the Nobel prize in physiology or medicine 1962 was Among the winners was not died by that time from cancer Rosalind Franklin, as the prize is not awarded posthumously.

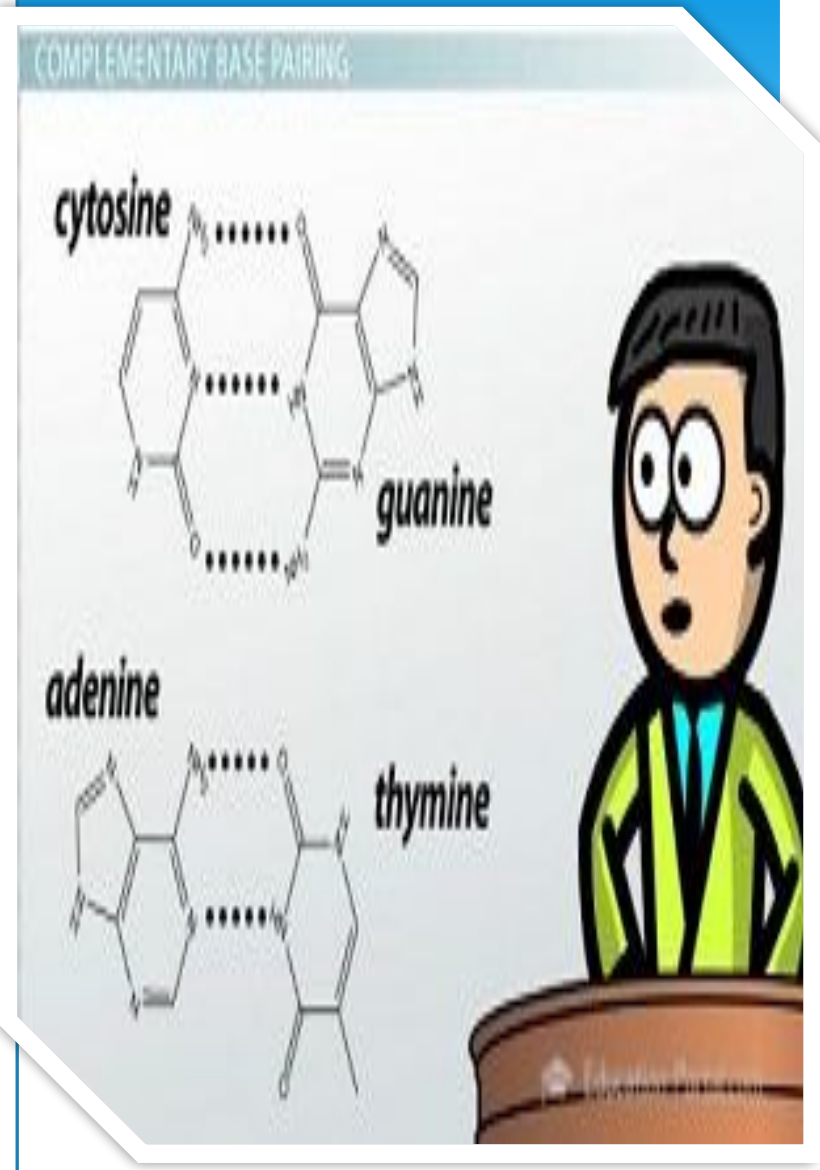
Френсис Крик



Джеймс Уотсон

Strand of polynucleotides

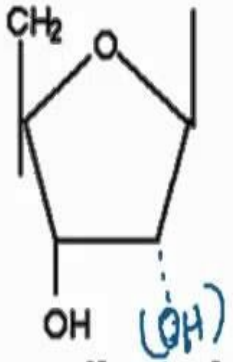
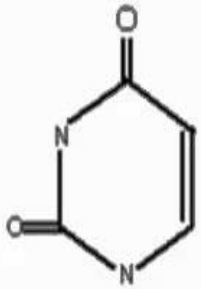
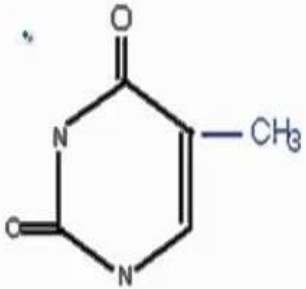
DNA's ability to store - and transmit - information lies in the fact that it consists of two polynucleotide strands that twist around each other to form a double-stranded helix. The bases link across the two strands in a specific manner using hydrogen bonds: cytosine (C) pairs with guanine (G), and adenine (A) pairs with thymine (T).



Differences between RNA and DNA

S.No.	RNA	DNA
1)	Single stranded mainly except when self complementary sequences are there it forms a double stranded structure (Hair pin structure)	Double stranded (Except for certain viral DNA s which are single stranded)
2)	Ribose is the main sugar	The sugar moiety is deoxy ribose
3)	Pyrimidine components differ. Thymine is never found(Except tRNA)	Thymine is always there but uracil is never found
4)	Being single stranded structure- It does not follow Chargaff's rule	It does follow Chargaff's rule. The total purine content in a double stranded DNA is always equal to pyrimidine content.

What makes DNA and RNA different?

	RNA	DNA
1) ribose sugar		
	(ribonucleic acid)	(deoxy ribonucleic acid)
2)T and U		
	uracyl	thymine
3) strand	single	double

braingenie

RNA

DNA

In molecular biology, DNA replication is the biological process of producing two identical replicas of DNA from one original DNA molecule. This process occurs in all living organisms and is the basis for biological inheritance. DNA is made up of a double helix of two strands, and each strand of the original DNA molecule serves as a template for the production of the complementary strand, a process referred to as semiconservative replication. Cellular proofreading and error-checking mechanisms ensure near perfect fidelity for DNA replication.In a cell, DNA replication begins at specific locations, or origins of replication, in the genome.Unwinding of DNA at the origin and synthesis of new strands results in replication forks growing bidirectional from the origin. A number of proteins are associated with the replication fork which helps in terms of the initiation and continuation of DNA synthesis. Most prominently, DNA polymerase synthesizes the new DNA by adding complementary nucleotides to the template strand.DNA replication can also be performed in vitro (artificially, outside a cell). DNA polymerases isolated from cells and artificial DNA primers can be used to initiate DNA synthesis at known sequences in a template DNA molecule. The polymerase chain reaction (PCR), a common laboratory technique, cyclically applies such artificial synthesis to amplify a specific target DNA fragment from a pool of DNA.