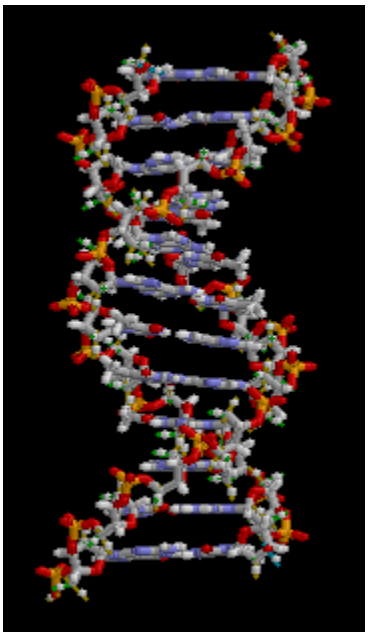
DNA vs RNA

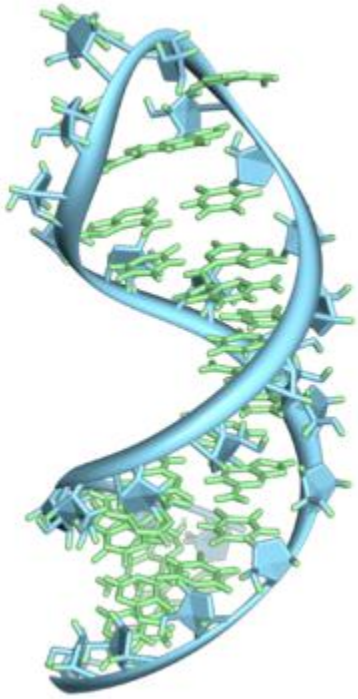
	DNA	RNA	Hide All
Difference:	1.Found in nucleus 2. sugar is deoxyribose 3. Bases are A,T,C,G	1.Found in nucleus and cytoplasm 2.sugar is ribose. 3. Bases are A,U,C,G	hide
Bases & Sugars:	DNA is a long polymer with a deoxyribose and phosphate backbone and four different bases: adenine, guanine, cytosine and thymine	RNA is a polymer with a ribose and phosphate backbone and four different bases: adenine, guanine, cytosine, and uracil	hide
Definition:	A nucleic acid that contains the genetic instructions used in the development and functioning of all known living organisms	RNA, single-stranded chain of alternating phosphate and ribose units with the bases adenine, guanine, cytosine, and uracil bonded to the ribose. RNA molecules are involved in protein synthesis and sometimes in the transmission of genetic information.	hide
Job/Role:	Medium of long-term storage and transmission of genetic information	The main job of RNA is to transfer the genetic code need for the creation of proteins from the nucleus to the ribosome. this process prevents the DNA from having to leave the nucleus, so it stays safe. Without RNA, proteins could never be made.	hide
Stands for:	DeoxyriboNucleicAcid	RiboNucleicAcid	hide
Predominant Structure:	Typically a double- stranded molecule with a long chain of nucleotides	A single-stranded molecule in most of its biological roles and has a shorter chain of nucleotides	hide
Pairing of Bases:	A-T(Adenine-Thymine), G-C(Guanine-Cytosine)	A-U(Adenine-Uracil), G-C(Guanine-Cytosine)	hide
Stability:	Deoxyribose sugar in DNA is less reactive because of C-H bonds. Stable in alkaline conditions. DNA has smaller grooves where the damaging enzyme can attach which makes it harder for the enzyme to attack DNA.	Ribose sugar is more reactive because of C-OH (hydroxyl) bonds. Not stable in alkaline conditions. RNA on the other hand has larger grooves which makes it easier to be attacked by enzymes.	hide
Unique Features:	The helix geometry of DNA is of B-Form. DNA is completely protected by the body i.e. the body destroys enzymes that cleave DNA. DNA can be damaged by exposure to Ultra-violet rays	The helix geometry of RNA is of A-Form. RNA strands are continually made, broken down and reused. RNA is more resistant to damage by Ultra-violet rays.	hide

The **main difference between DNA and RNA** is the sugar present in the molecules. While the sugar present in a RNA molecule is *ribose*, the sugar present in a molecule of DNA is **deoxyribose**. Deoxyribose is the same as ribose, except that the former has one more OH.

DNA does not usually exist as a single molecule, but instead as a tightly-associated pair of molecules. These two long strands entwine like vines, in the shape of a double helix. This arrangement of DNA strands is called antiparallel. The asymmetric ends of DNA strands are referred to as the 5′ (five prime) and 3′ (three prime) ends. One of the major differences between DNA and RNA is the sugar, with 2-deoxyribose being replaced by the alternative pentose sugar ribose in RNA. The four **bases found in DNA** are *adenine* (abbreviated A), *cytosine* (C), *guanine* (G) and *thymine* (T). A fifth pyrimidine base, called *uracil* (U), usually takes the place of thymine in **RNA** and differs from thymine by lacking a methyl group on its ring.



DNA helix structure



Structure of RNA (hairpin loop from pre-mRNA)

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