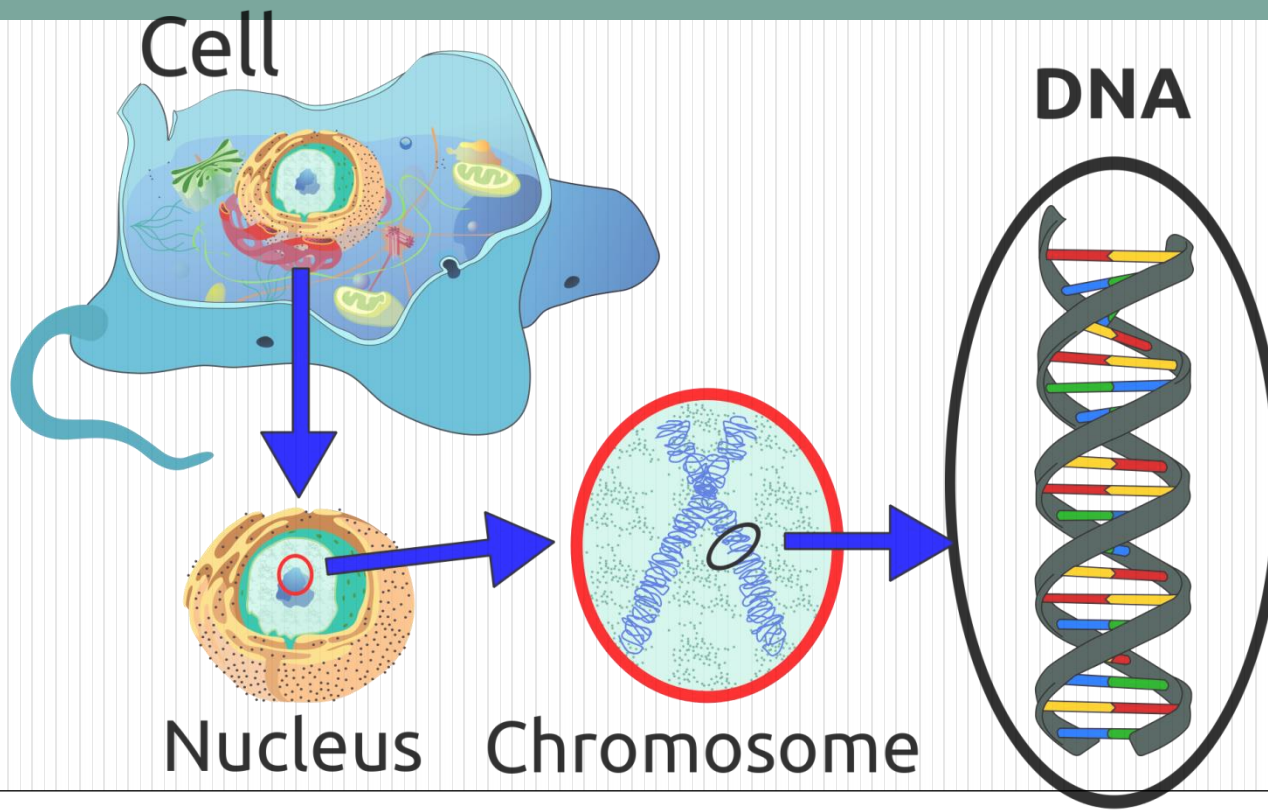


# General Introduction to the Nucleic Acid

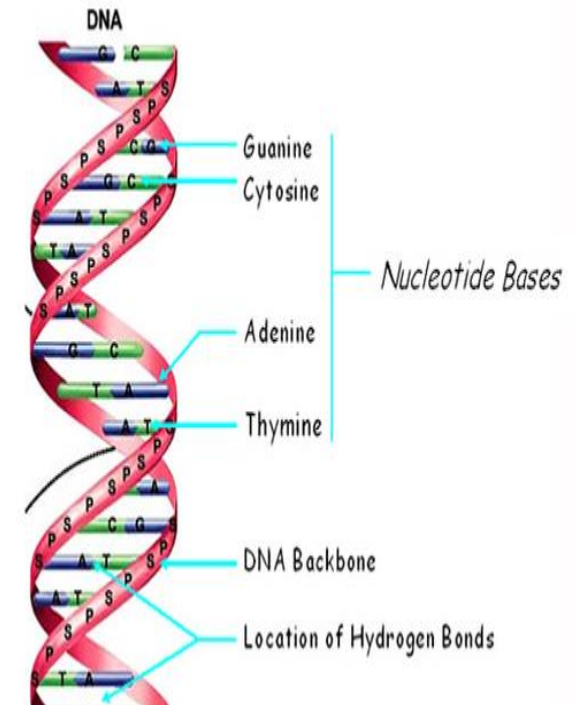
Done by: Sahar ALSubaie

# Biology of the Nucleic Acid



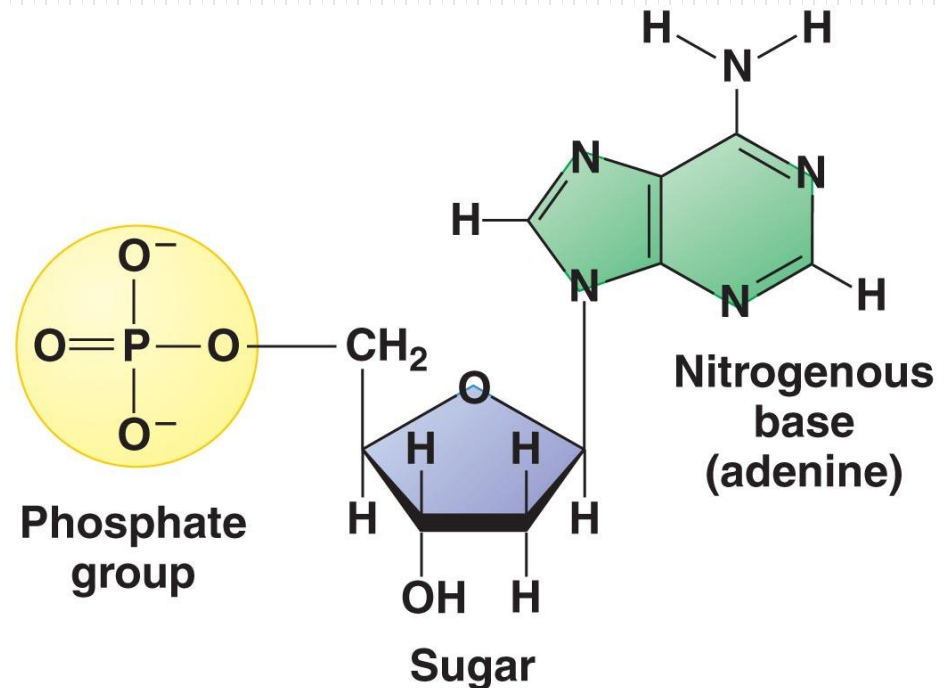
# Nucleic Acid Definition:

Nucleic Acid is a macromolecule composed of chains of monomeric nucleotides

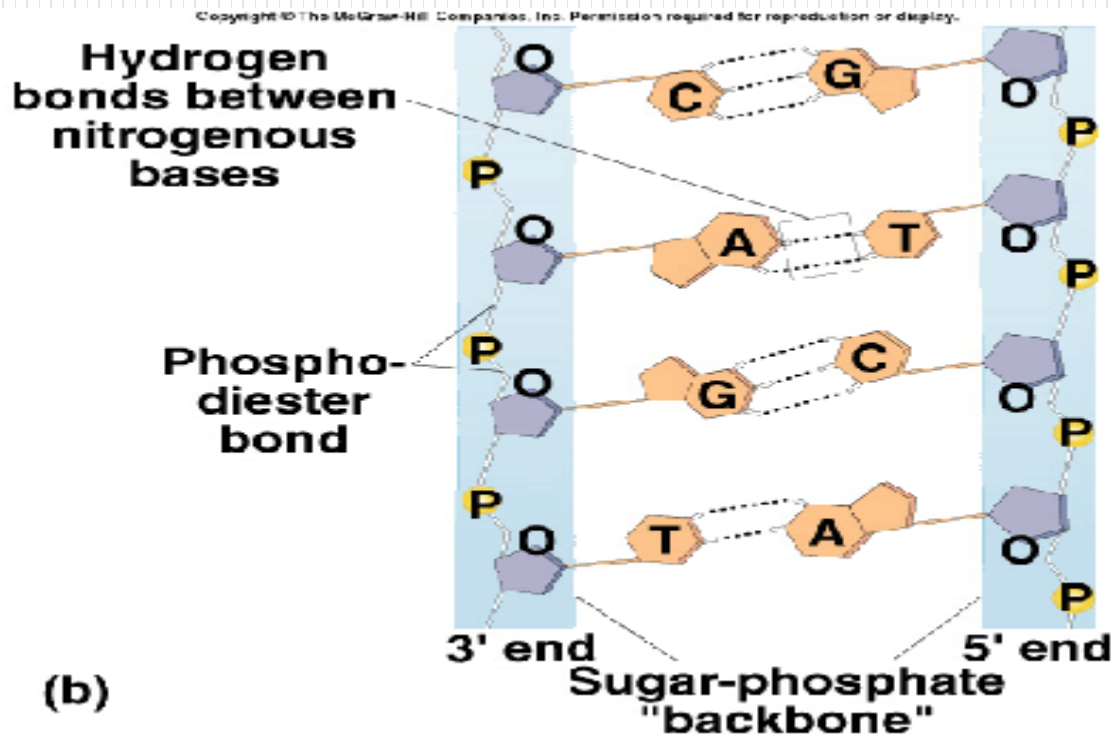


# Chemical Structure of Nucleotides:

- Nitrogenous base.
- Pentose sugar.
- Phosphate group.



# Chemical bonds in the nucleic acid :



# DNA:

Deoxyribonucleic acid is a nucleic acid that contains the genetic instructions used in the development and functioning of all known living organisms

# Role of DNA:

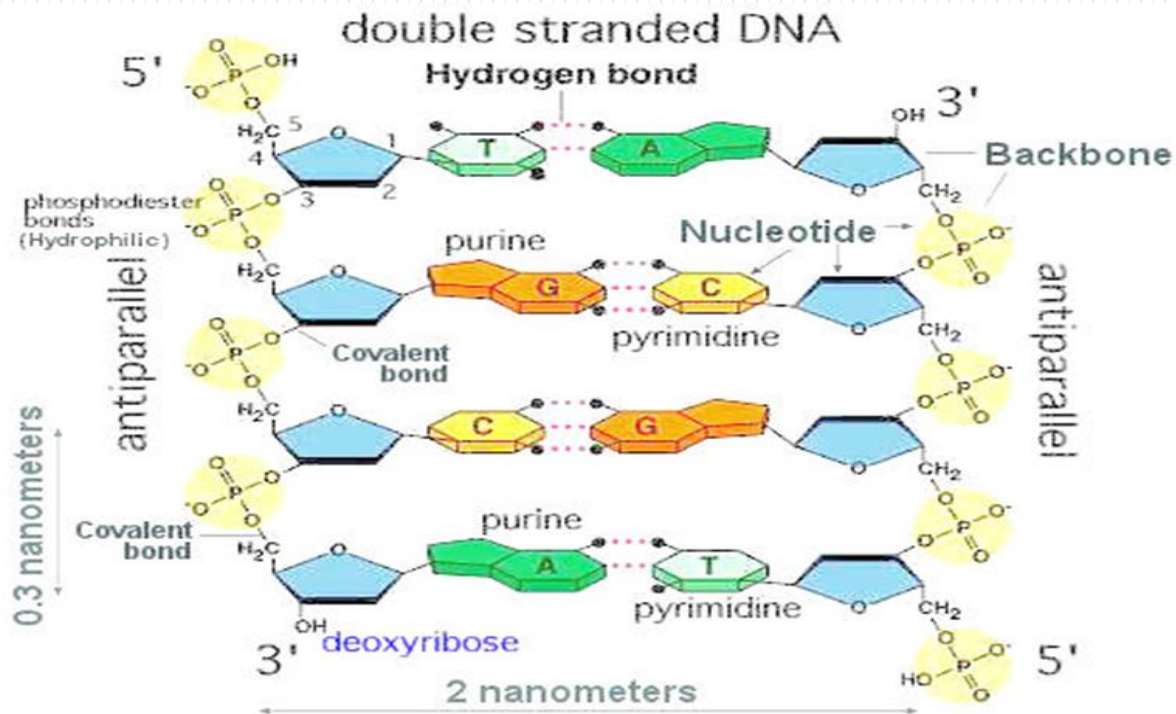
The **genes** carry long-term storage of information & instructions needed to construct other components of cells, such as **proteins** and **RNA** molecules.

# DNA Structure:

- ❑ DNA is a **double helix** of two **anti-parallel**, complementary strands .
- ❑ The strands composed of phosphate-sugar **backbone** with nitrogenous bases arranged inside.



# DNA Structure:



# DNA organization in the cells :

- ❑ linear chromosomes in eukaryotes,
- ❑ circular chromosomes in prokaryotes.

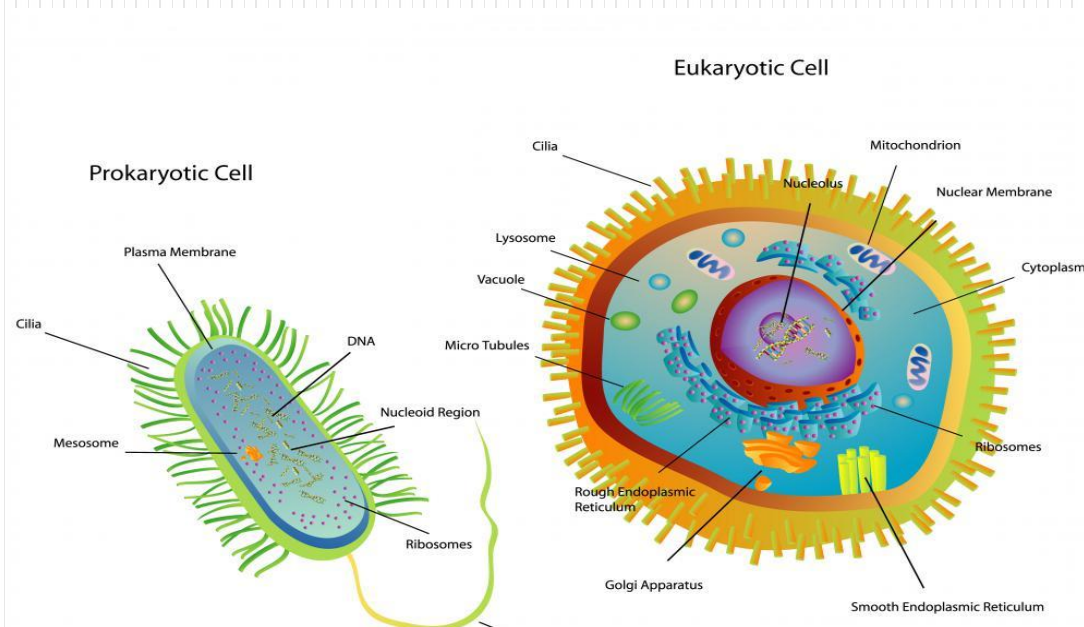
# Eukaryotic cells hold DNA in:

- cell nucleus .
- mitochondria .
- chloroplasts.

prokaryotes :

prokaryotes store their DNA only in the cytoplasm.

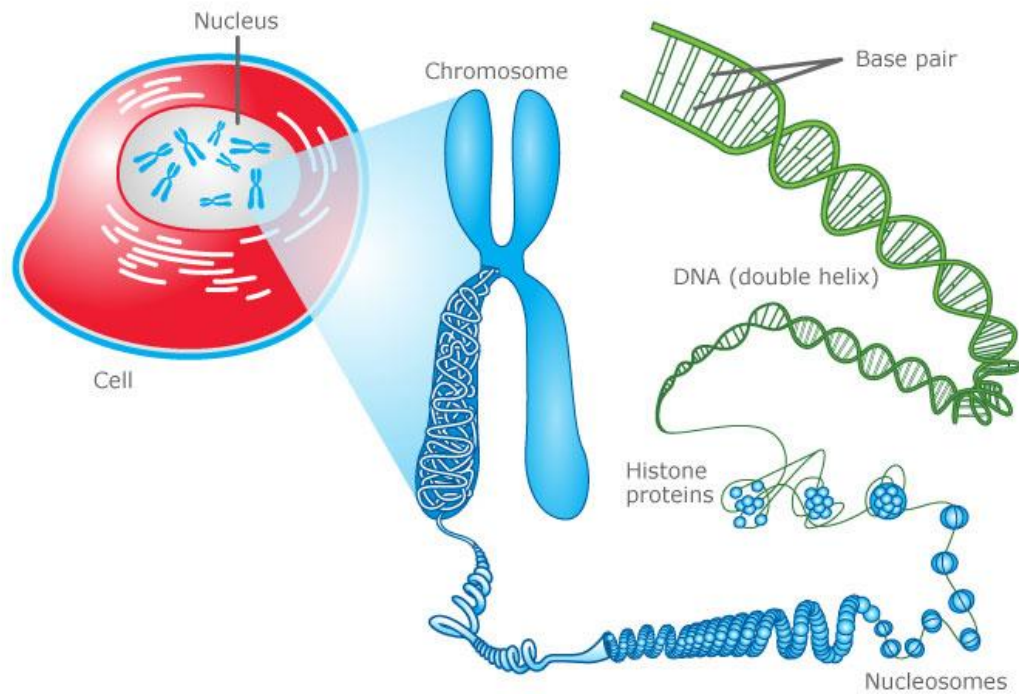
# Prokaryotes vs. Eukaryotic.



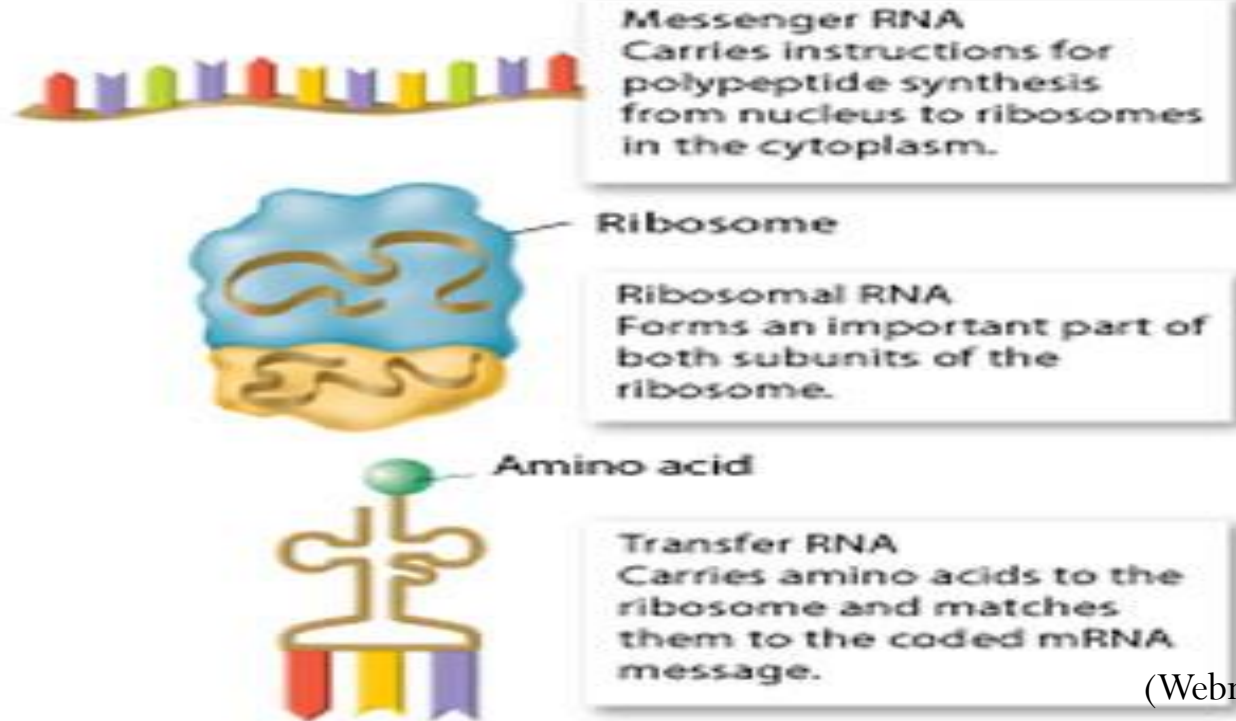
# DNA packing:

DNA is organized into long structures called chromosomes

# DNA packing:



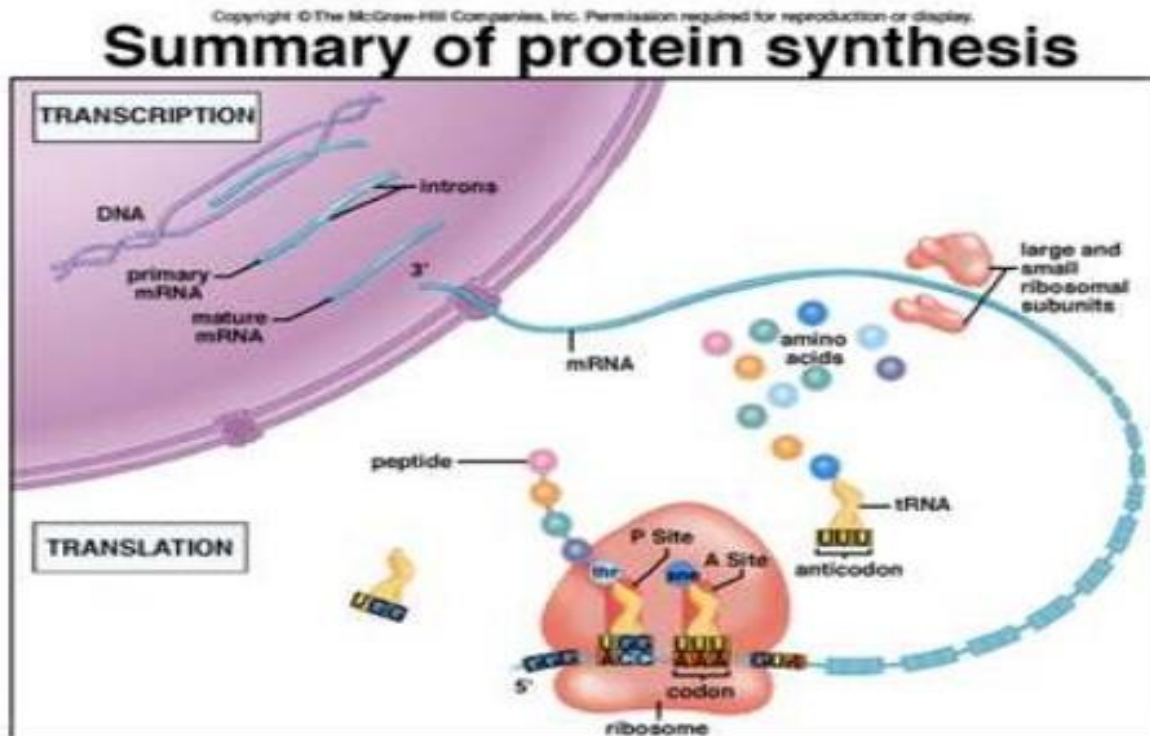
# Ribonucleic acid (RNA):



(Webmaster, 2012)



# Protein Synthesis:



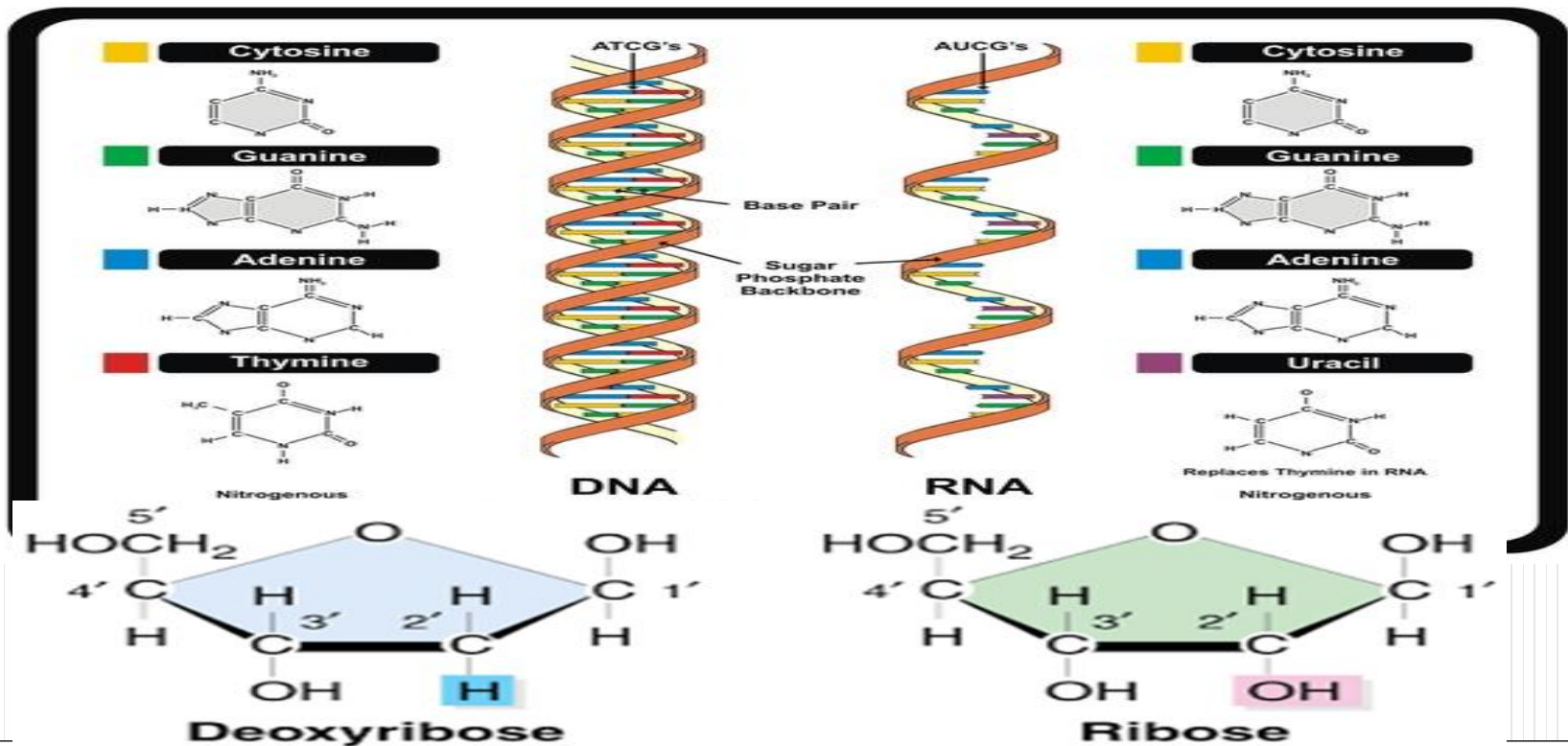
# Protein Synthesis:

<http://www.jayreimer.com/TEXTBOOK/iText/products/0-13-115516-4/ActiveArt/cbp-4123.htm>

# DNA vs RNA Structure:

DNA	RNA
Double stranded	Single stranded
Nitrogenous bases are A , <b>T</b> , G,C	Nitrogenous bases are A , <b>U</b> G,C
Deoxyribose sugar	Ribose sugar

# DNA vs RNA Structure:

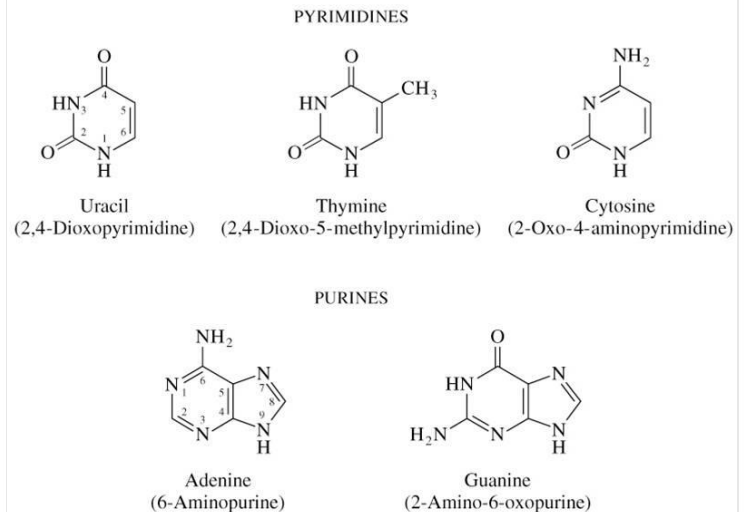


# Nucleic Acid Components:

- ❑ Nucleobases.
- ❑ Nucleosides.
- ❑ Nucleotides and deoxynucleotides

# Nucleobases:

Nucleobases are heterocyclic aromatic organic compounds containing nitrogen atoms



# Nucleosides:

- ❑ Nucleosides are glycosylamines made by attaching a nucleobase to a ribose or deoxyribose (sugar) ring.
- ❑ In short, a nucleoside is a base linked to sugar.

# Nucleotides

nucleotide consists of a nucleoside and one phosphate group.



# Molecular Biology:

Molecular biology is the study of biology at a molecular level.

# Genetics:

Genetics is the study of the effect of genetic differences on organisms.

# Mutations:

A change in the nucleotide sequence in a gene or a chromosome

# References:

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- ❑  Freisinger, E; Grollman; Miller; Kisker (2004). "Lesion (in) tolerance reveals insights into DNA replication fidelity.". The EMBO journal 23 (7): 1494–505. doi:10.1038/sj.emboj.7600158. PMID 15057282.
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- ❑ Boundless. "The Structure and Sequence of DNA." Boundless Biology. Boundless, 26 May. 2016. Retrieved 24 Aug. 2016 from <https://www.boundless.com/biology/textbooks/boundless-biology-textbook/dna-structure-and-function-14/dna-structure-and-sequencing-100/the-structure-and-sequence-of-dna-433-11661/>
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