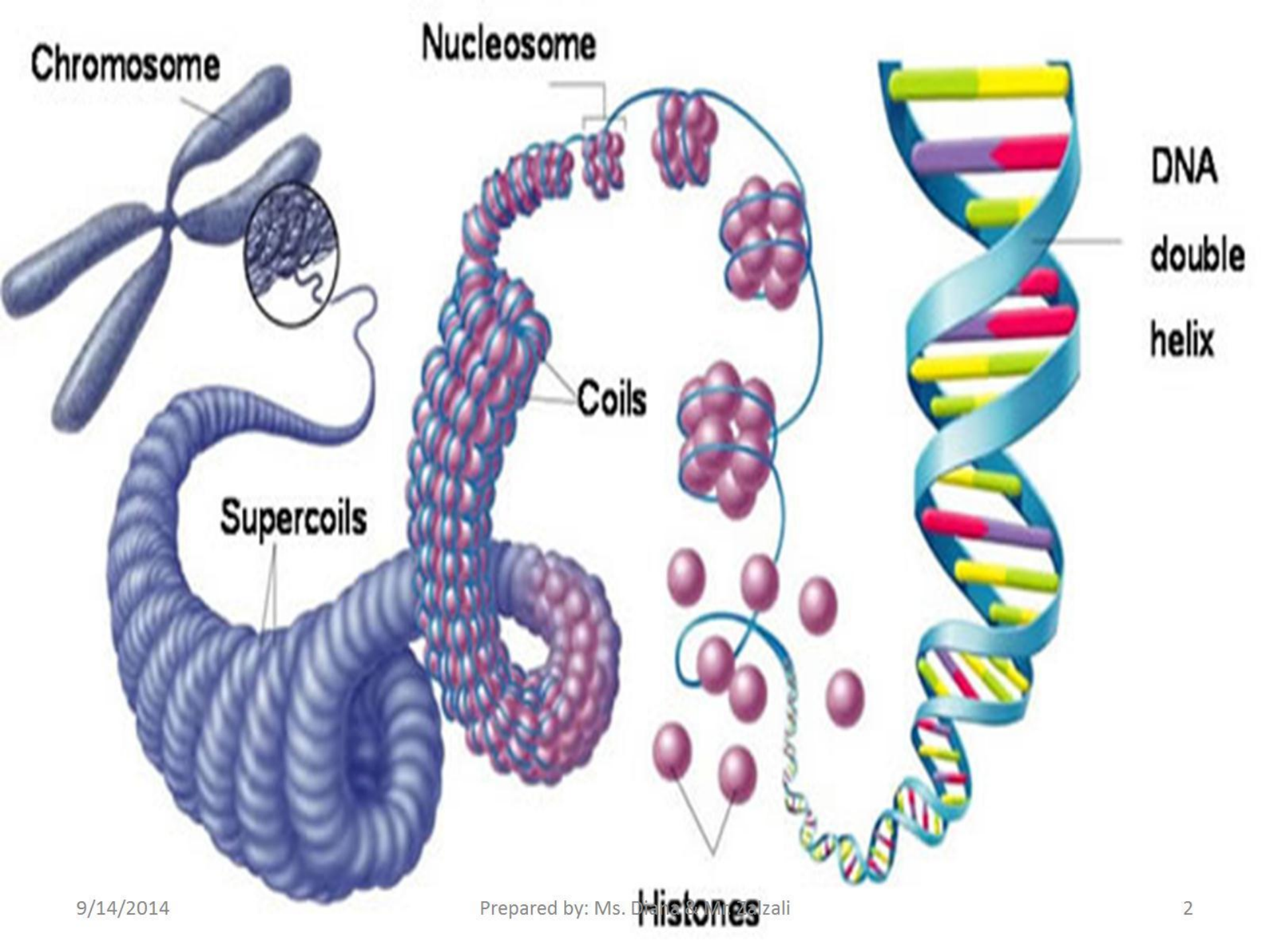
Chapter 9
Section 2

DNA Structure


Chromosome
Nucleosome
DNA
double
helix
Coils
Supercoils
Histones

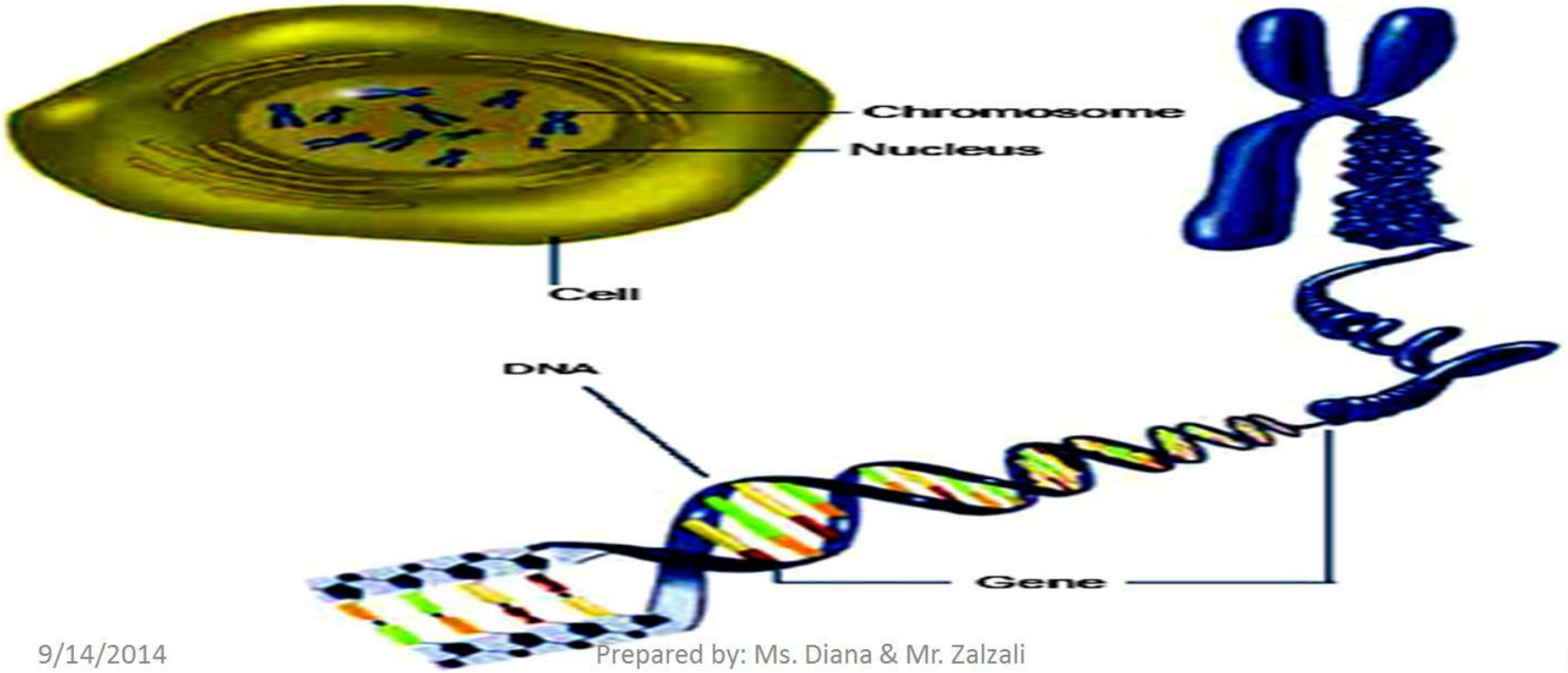
DNA:

-Stands for " **D**eoxyribo**N**ucleic **A**cid"

-Genetic material

-Made up of complex organic compound

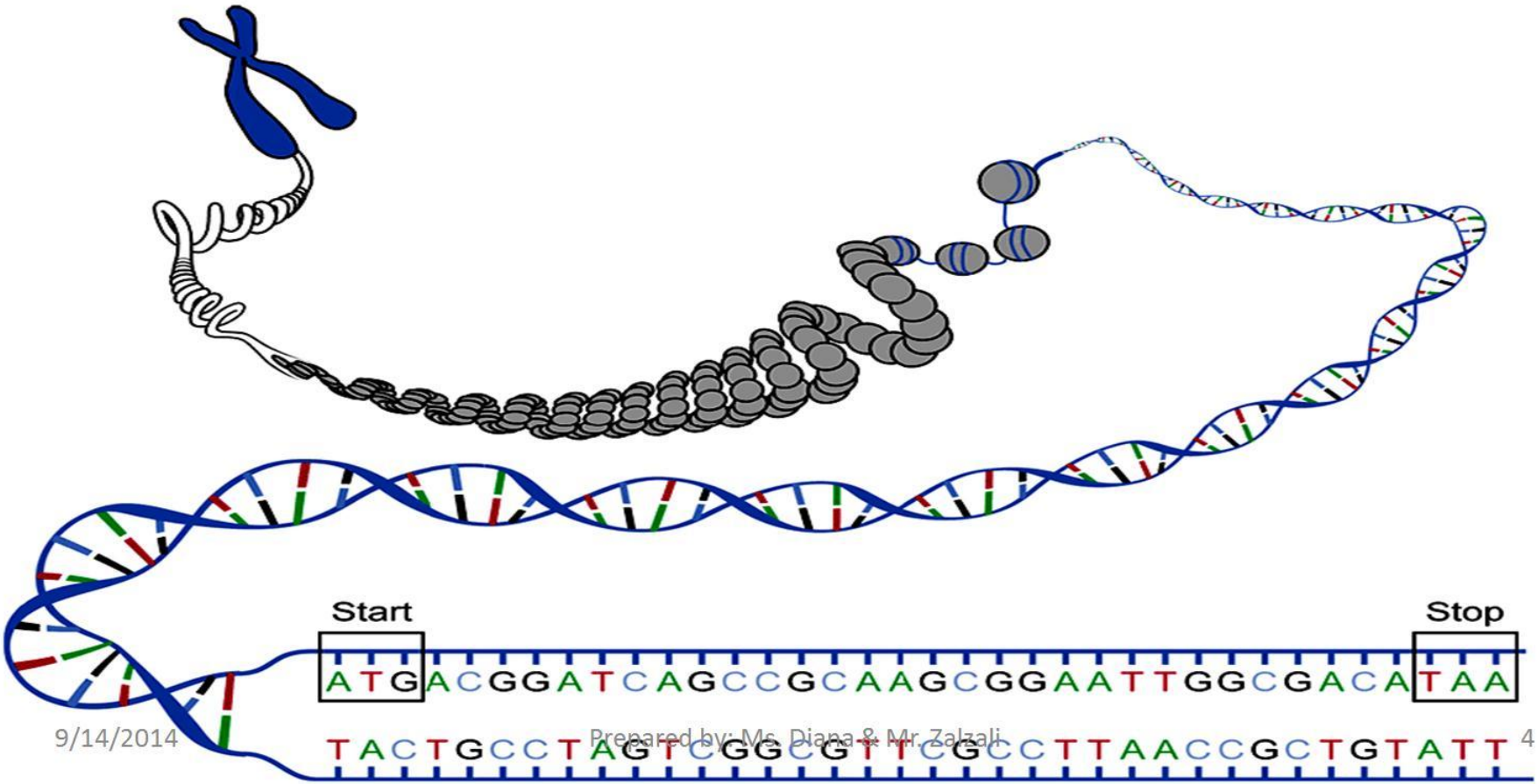
-Main function: stores all the genetic information (genetic code) that directs all cell activities and determines its characteristics.



-DeoxyriboNucleic Acid

-DNA is the hereditary material that stores the genetic information of each cell and directs cells activities and determines its characteristics.

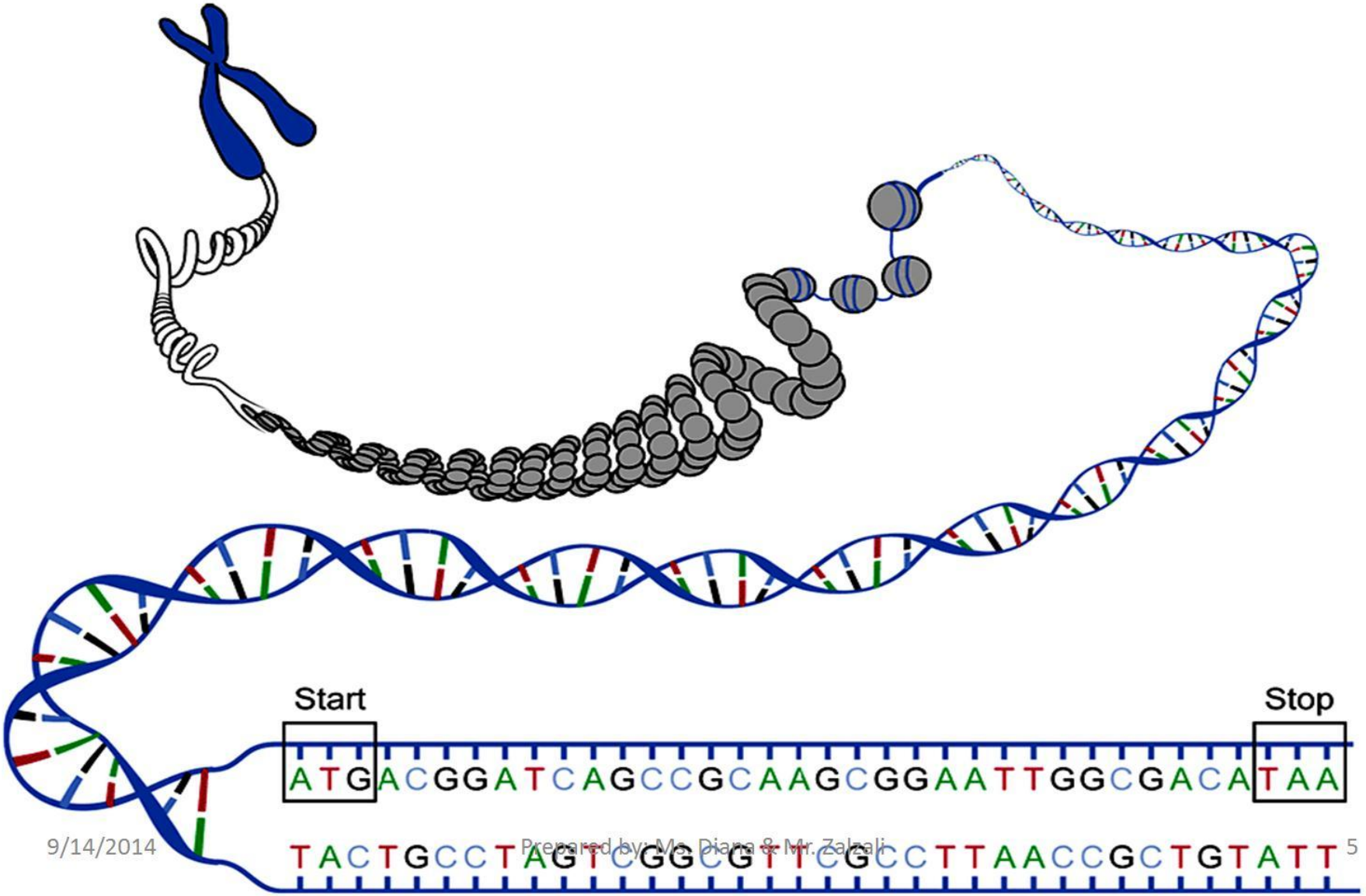
-DNA is a polymer (v. large) molecule because it consists of repeated linked subunits called nucleotides



-Nucleotides :

-The basic subunit of nucleic acids (DNA and RNA).

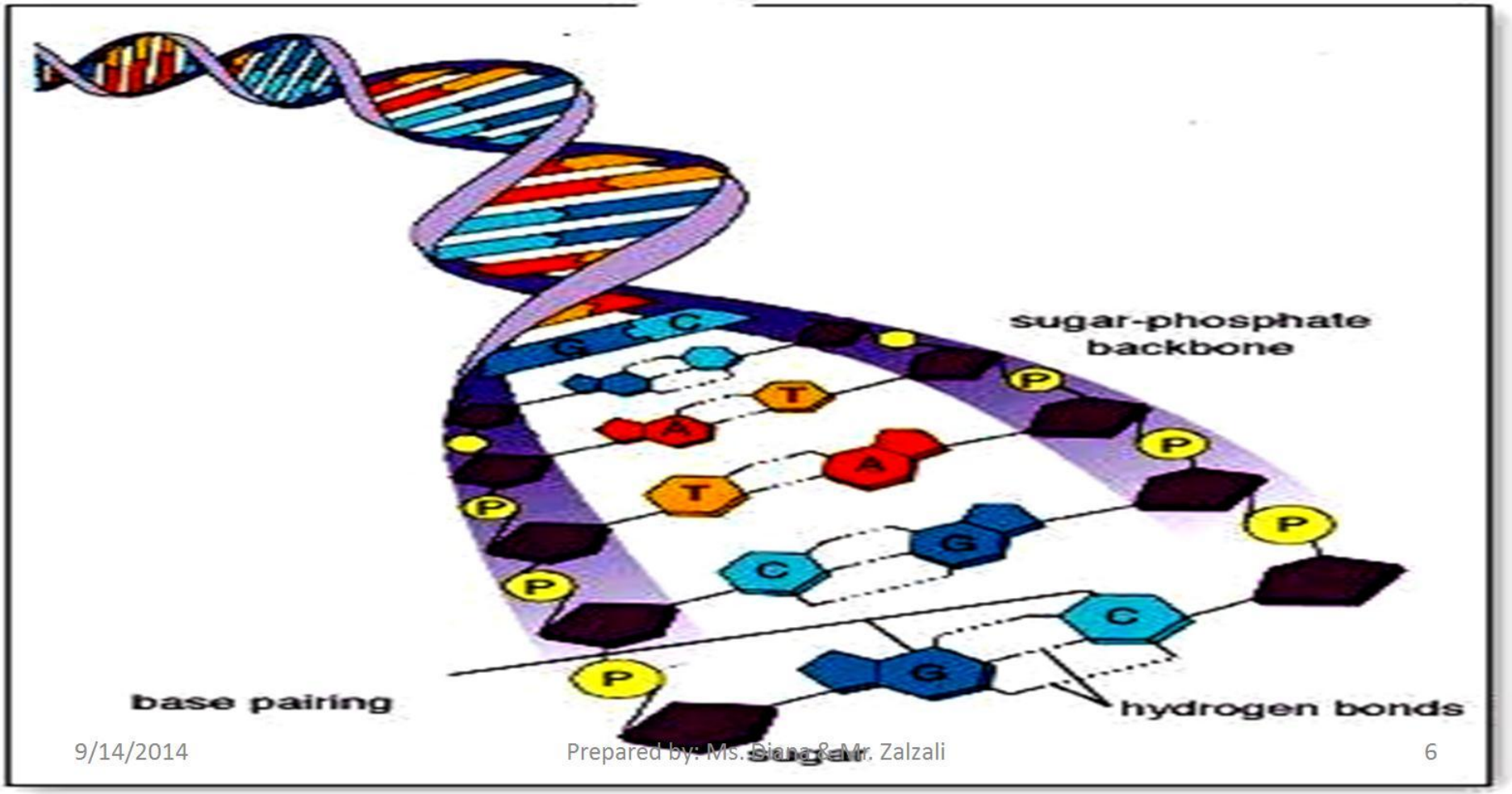
-Each Nucleotide is made up of:



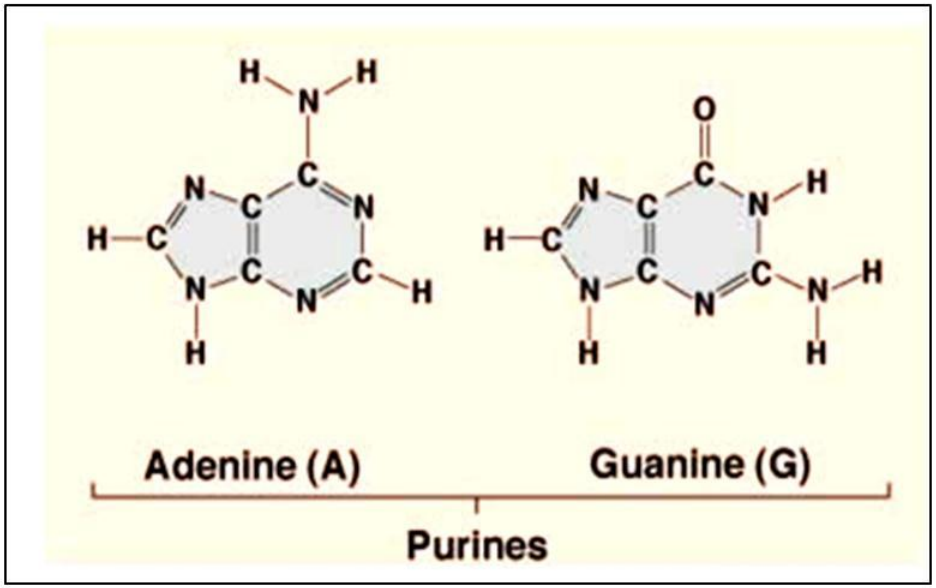
DNA structure:

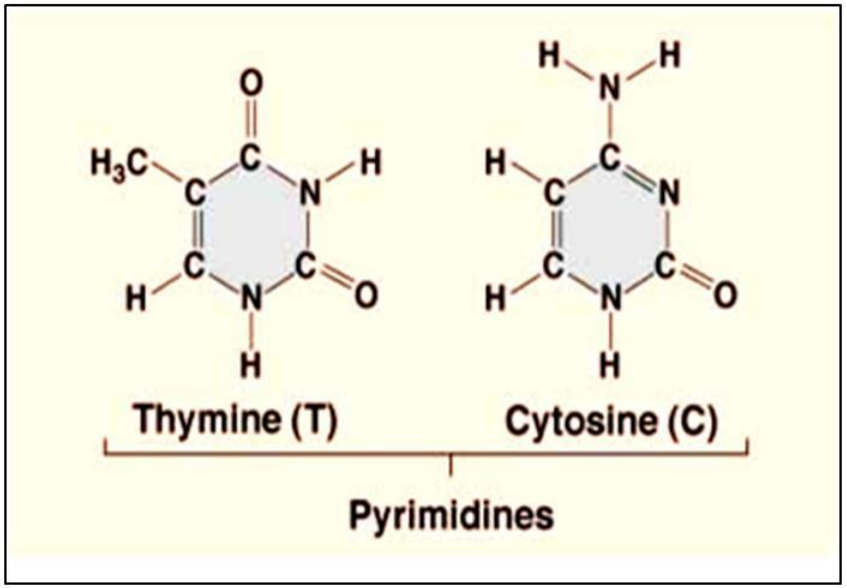
-DNA has a "double helix" structure.

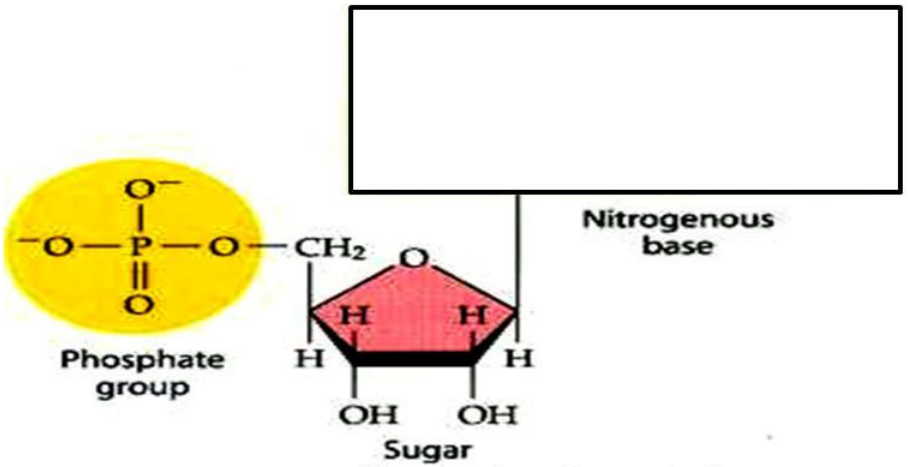
-It is composed of 2 strands of linked nucleotides, twisted around each other in a spiral pattern and linked by weak hydrogen bonds.



Nitrogen bases

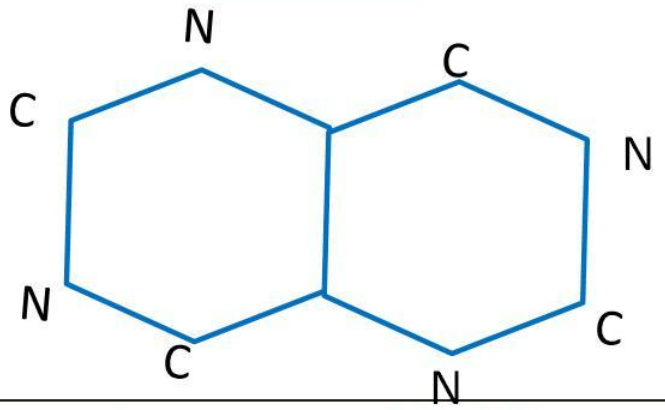






Nitrogen bases

Purines



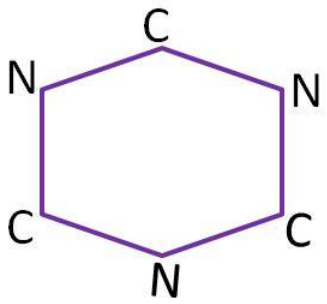
-N.bases that consist of **double rings** of carbon and nitrogen atoms.

-Ex.

-Adenine (A)

-Guanine (G)

Pyrimidines



-N.bases that consists of **one single ring** of carbon and nitrogen atoms.

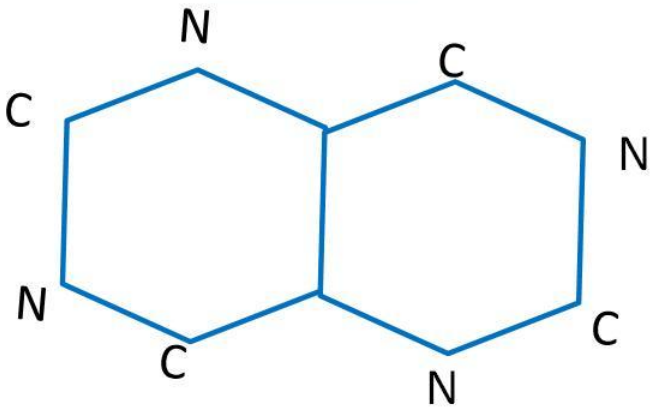
-Ex :

-Thymine (T)

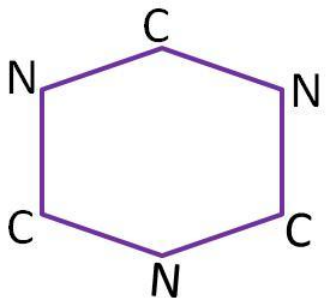
-Cytosine (C)

Nitrogen bases

Purines



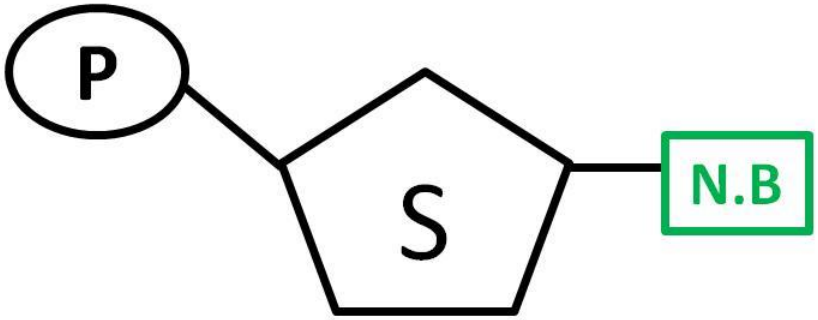
Pyrimidines

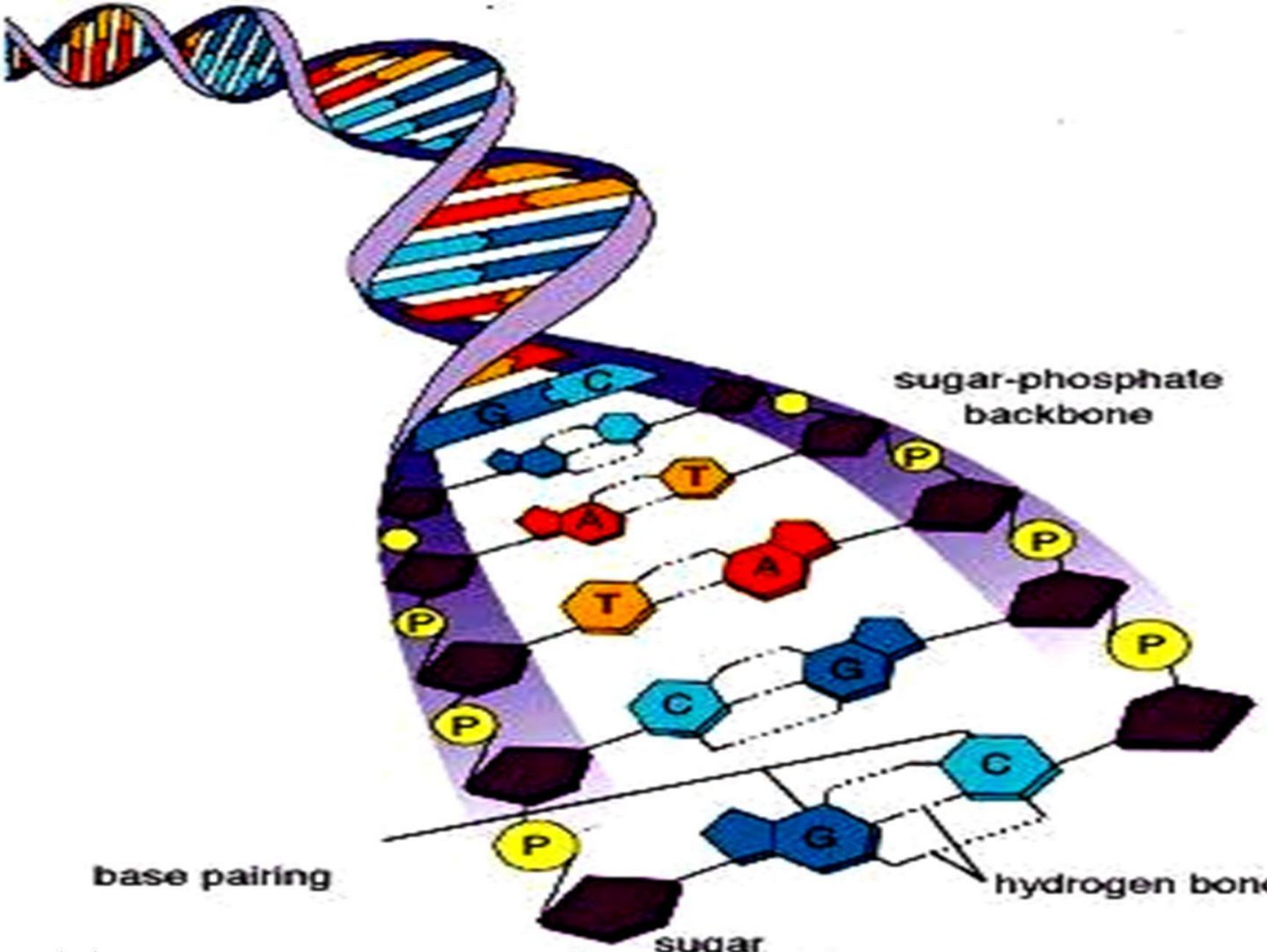


-Similarities between purine and pyrimidine:

1-Both organic compounds with ring shape of C and N atoms

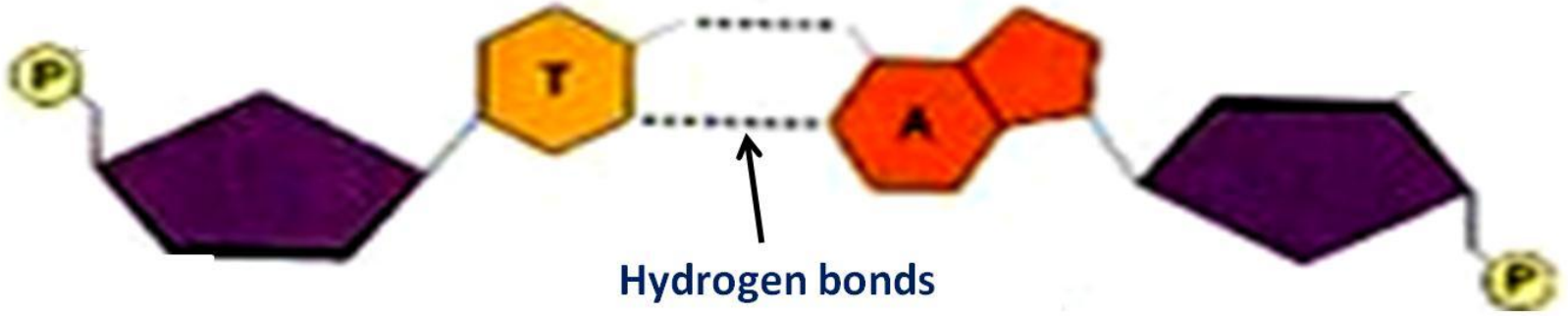
2- Both are nitrogenous bases in nucleotides of DNA molecule.



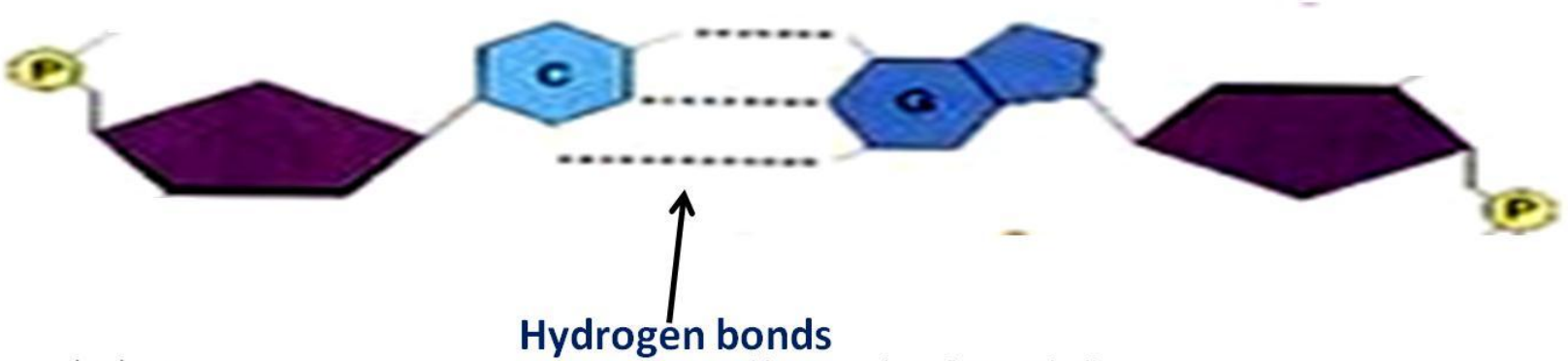

sugar-phosphate backbone
base pairing
hydrogen bonds
sugar
G
C
T
A
P

Base pairing rule states :

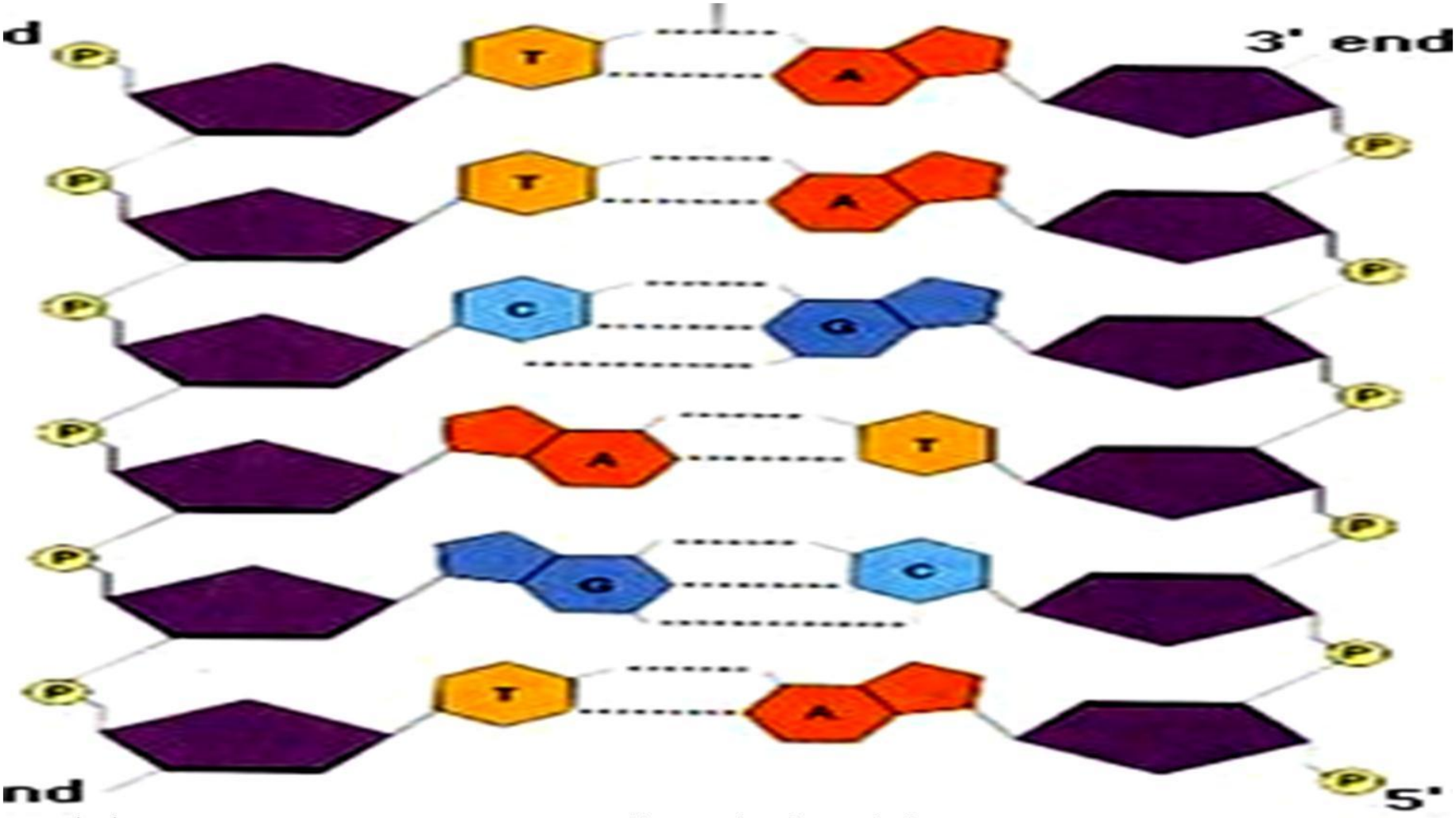
- 1 - Thymine (T) pairs only with Adenine (A) and 2 week hydrogen bonds are formed



- 2- Cytosine (C) pairs only with Guanine (G) and **3 week** hydrogen bonds are formed



- *So according to base pairing - rule*
  - Adenine (A) is complementary to thymine (T)
  - Guanine (G) is complementary to cytosine (C)



- Steps of DNA replication:

- Step 3 :

-The DNA polymerase continues adding nucleotides until all of the DNA has been copied.

- DNA polymerases are signaled to detach

- Two DNA molecules are produced, each composed of a new and original strand .

- NOTE:

- The nucleotide sequence in both of these strands are identical to each other and to the original DNA molecule.