

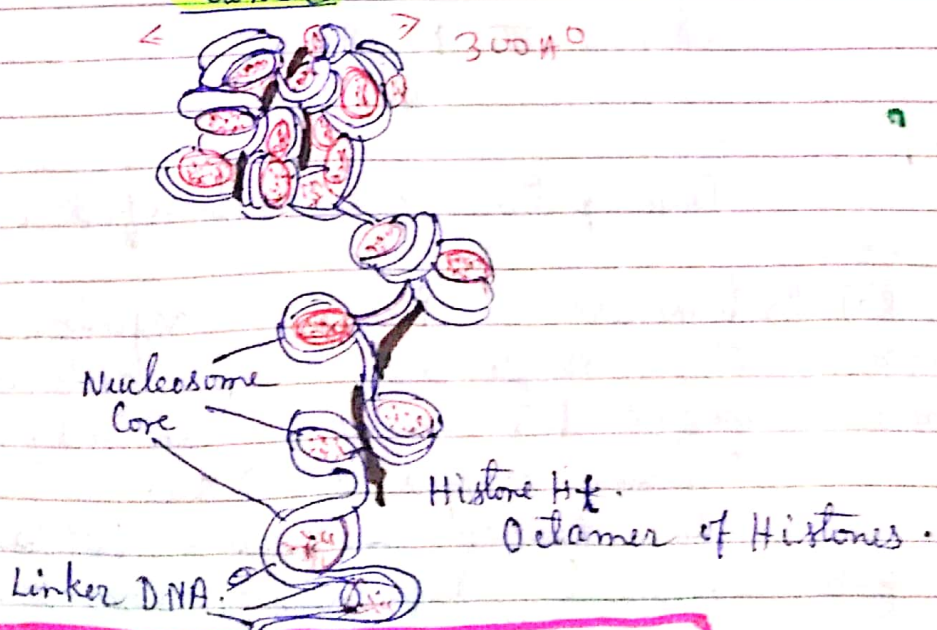
B) Telomeres :

It is the most conservative elements. ~~both~~ DNA consists of randomly repeated C-G sequence on either one (one of repeated C & the other of repeated G).

There are same repeated sequence in all of the chromosomes in a species. At least ten (10) kilobases of this repeat DNA. It is associated with non-histone protein. It is attached with nuclear envelope.

These (Telomeres) are very important part of chromosome. They are for the complete replication. They form caps ~~the~~ protecting chromosome from nuclease. Fusing the chromosomes ~~with~~ together.

Shortening of telomeres indicates the activation of suicide of the cell. This shortening of telomeres facilitates a pivotal role in protection from Cancer.



Schematic Structure of Solenoid.

MOLECULAR COMPONENTS of CHROMOSOME

Chemically a chromosome consists of

- a) DNA
- b) RNA
- c) Proteins
 - i) Protamines
 - ii) Histones
 - iii) Non-Histone

— d) Metallic ions etc.

a) DNA → It is the most stable molecule. It transfers heredity.

b) RNA → Associated with replication of DNA and translation of m formation of protein.

c) Protein — They are mainly of two types in nature

- x) Acidic
- x) Basic

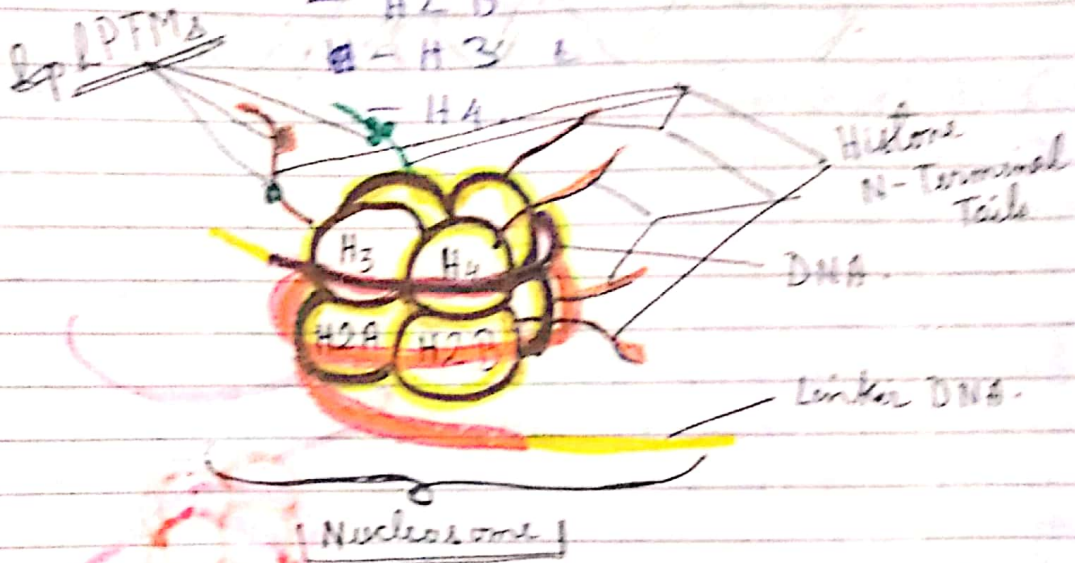
These proteins are classified as

(i) Protamines: Rich in arginine. Simple ones are of molecular weight less than 4000 daltons. These are wrapped over DNA. There are twenty eight (28) amino acids residue (19 Arginine, 9 non-basic amino acids).

ii) Histones: These are basic proteins associated with DNA. There is 1:1 ratio of DNA: Histone.

There are five types of histones.

- H1 (H5)
- H2A
- H2B
- H3
- H4



iii) Non-Histone Proteins: The molecular weight ranges from 11,000 - 21,500 daltons according to different cells, tissues and species.

They have structural, enzymatic and regulatory function.

They include enzymes of chromosomal metabolism e.g.

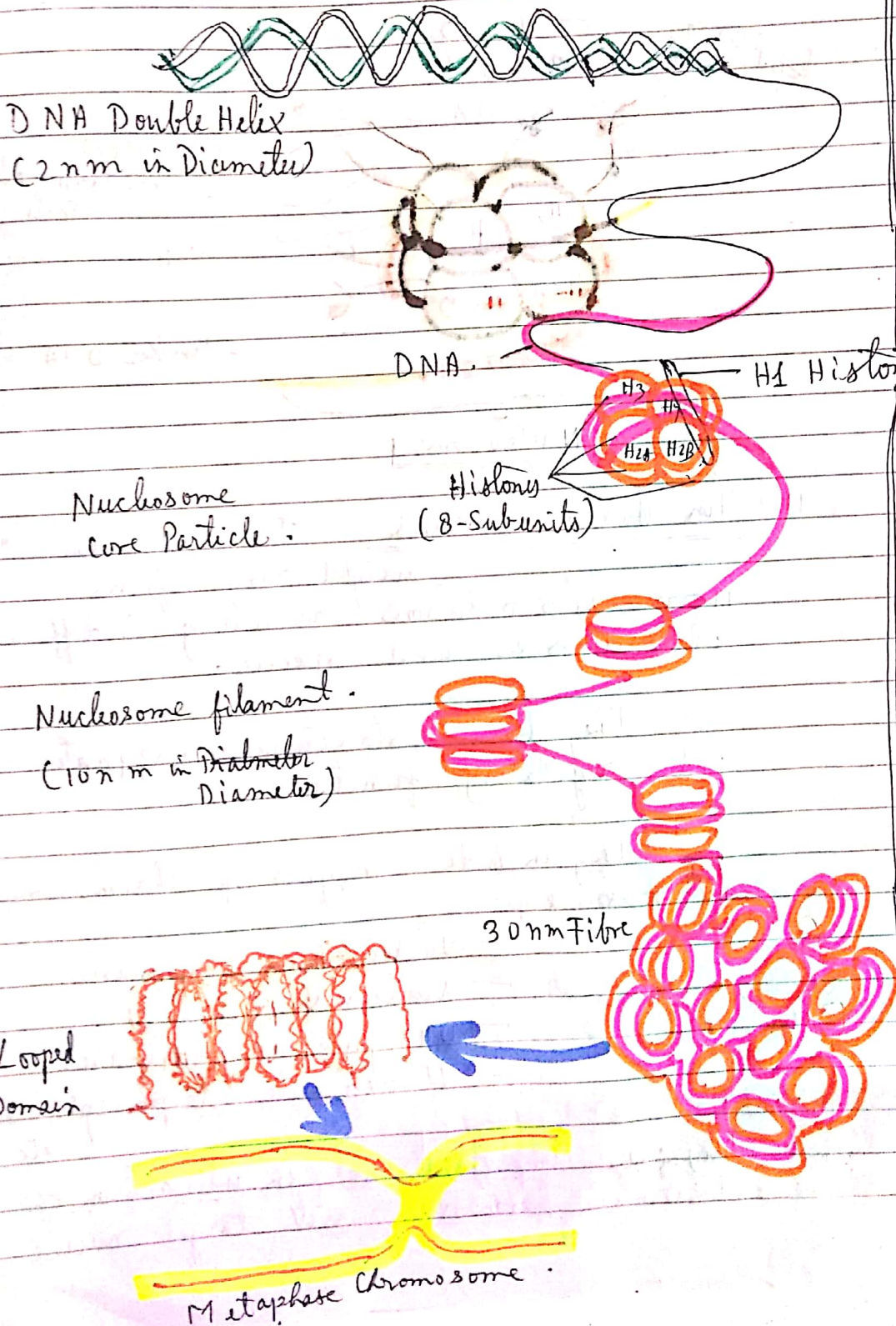
- Nucleic Acid polymerase
- Nucleases
- Adenylate cyclase
- Nucleoside triphosphatase etc.

They play important role in interaction of steroid hormones with target nuclei

(12)

d) Metallic ions.

Chromosomes possess
metallic ions of
Magnesium (Mg^{+2})
& Calcium (Ca^{+2})



VARIOUS LEVELS OF ORGANIZATION OF CHROMOSOME