

Nucleosome Model :

Also known as packaging of DNA helix. The distance between two consecutive base pairs is 0.34 nm ($0.34 \times 10^{-9} \text{ m}$). If the length of DNA double

length. In a typical mammalian cell is calculated
by multiplying the total no. of bp
with distance between two consecutive bp, that

is $3.2 \times 10^9 \text{ bp} \times 0.34 \times 10^{-9} \text{ m/bp}$, it comes out
to be approx. 3.2 metres. A length that is

far greater than dimension of particular
nucleus. In prokaryotes (E. coli) they do not

have a defined nucleus, the DNA not scattered
throughout cell. DNA (-)vely charged is held

with some proteins called histones. Histone
are rich in basic amino acid residues lysine
and arginine (that have positive charged)

region called as nucleoid. DNA in nucleoid

is organised in large loop held by proteins

In eukaryotes, this organisation is much
more complex. There is a set of positively

charged, basic proteins called histones. Protein

acquires charge depending upon amino acids
residues on side chain. Histone are rich in

in lysine and arginine. Both have positive

octamer and 146 base pair of DNA. Nucleosome consist of core particle and linker or spacer DNA. The core particle has two copies each of H2B, H3 and H4 histone molecules. The core particle is about 100\AA in diameter and 60\AA in height.

A/c to this theory, very long molecule of DNA (146bp) is packed into single unit of nucleosome constitute chromatin fibre. The chromatin fibre of 300\AA which is visible under electron microscope at metaphase develops from the nucleosome fibre as a consequence of super coiling of latter. This model of chromatin organisation was given by Kornberg and Thomas in 1974.

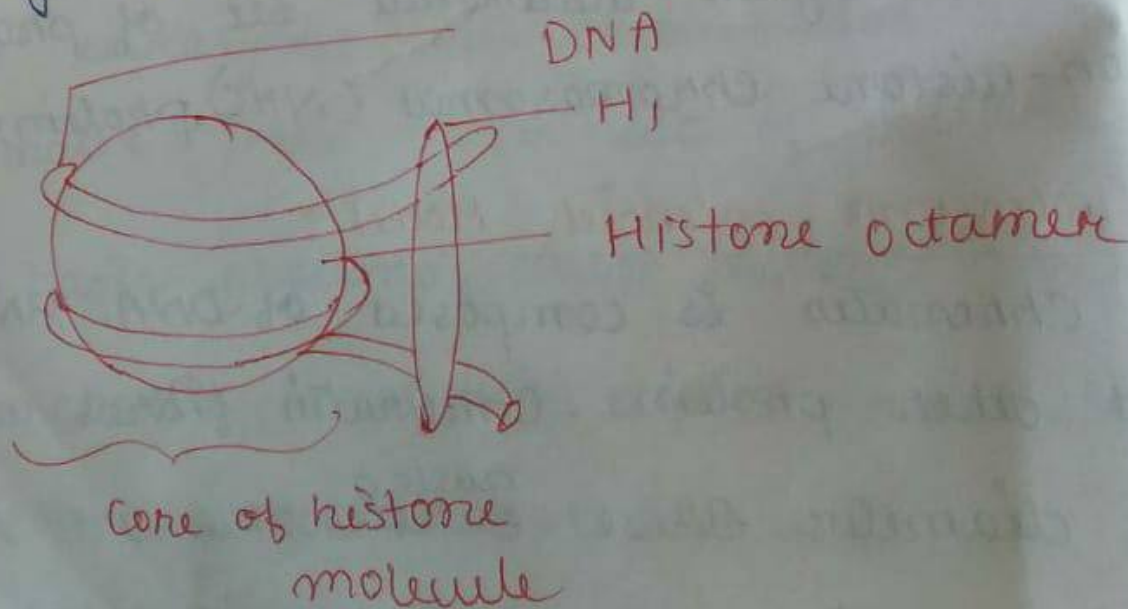


Fig : Nucleosome

charge in their side chains. Histones are formed
a unit of eight molecules called histone
octamer. The (-)vely charged DNA molecule is
wrapped around positively charged histone
octamer to form a structure called nucleosome.

A typical nucleosome contain 200bp of DNA helix.
Nucleosome constitute repeating unit of a struc-
-ture in nucleus called chromatin (thread
like stained (coloured) bodies seen in nucleus.

The nucleus of chromosome in chromatin are
seen as 'beads on string' structure viewed under
electron microscope.

These beads on string is packaged to
form chromatin fibres that are coiled and conden-
-sed at metaphase stage. These packaging of chroma-
-tin at higher additional set of protein called
non-histone chromosomal (NHC) proteins.

Nucleosome - solenoid Model :

Chromatin is composed of DNA, RNA, histones
and other proteins. Chromatin fibres are 300 Å
in diameter. These ^{nucleo}chromosome are slab unit
of chromatin and bead like appearance. Each