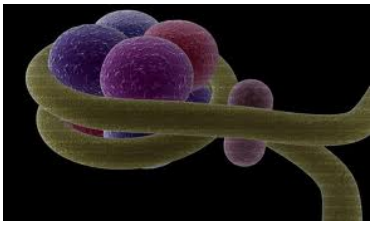
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Nucleosomes

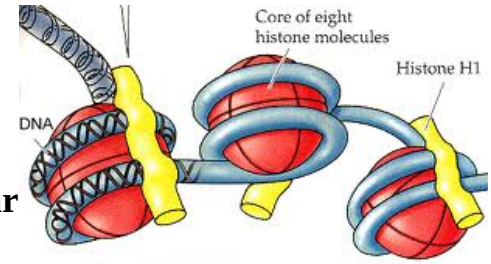
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Chromosome Organization



Eukaryotic chromosomes are made up of DNA and protein. This DNA has a packed structure. Depending upon the cell cycle stage, the structure will be modified.

During mitosis stage, the chromosomes show its proper structure. It is packed as a chromatin during the rest state of cell. Two forms of chromatin have been described.

The heterochr 

omatin:

- Densely packed form
- Second euchromatin with less dense form with nucleosomes, for every 300 base pair of DNA.
- Gene expression has been correlated.

Histone Proteins

Histone proteins build the scaffold of the nucleosomes. H1 (H5), H2A, H2B H3, and H4 are 5 major proteins formed. During evolution the conservation of the amino acid sequences of histones indicate the important role for the chromosome organization. The maximum mutation frequency found in H1 (H5). And the control of gene expression is also found in H1 (H5). At the nucleosomes surface, it plays a function which is very special in the complex of nucleosome.

Nucleosomes

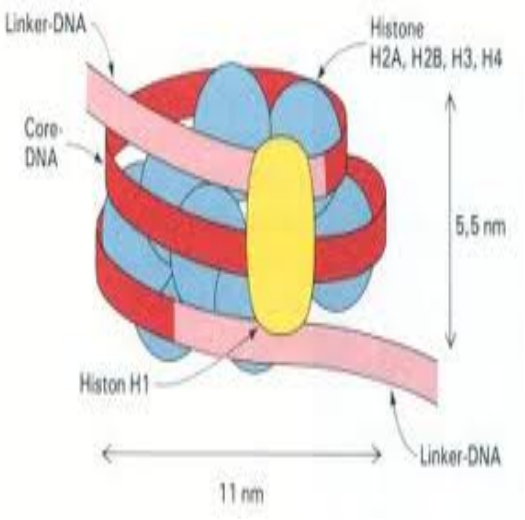
Structure of Nucleosome

The nucleosome hypothesis was proposed by Don and Ada Olins in 1974 and byRoger Kornberg.

Definition:

Nucleosome is the subunit of chromatin composed of a short length of DNA wrapped around a core of histone proteins.

Nucleosomes are the basic unit ofDNA packaging ineukaryotes. It has DNA segments packed around ahistoneprotein core. This structure looks like a thread wrapped around a spool. It forms the repeating units of eukaryotic chromatin.



Core Particles of Histone

Nucleosomes pass the inherited information. The core particle has about 147base pairs ofDNA wrap

ped in 1.67 left-handed superhelical turns around ahistone octamer consisting of 2 copies each of the core histonesH2A,H2B,H3 , andH4. Core particles are connected by stretches of "linker DNA", which can be up to about 80 bp long.

The non-condensed nucleosomes do not have linker histone. These chromosome looks like a bead on a string of DNA when we view it through electron microscope.

Mature sperm cells use the protamines to pack genomic DNA unlike eukaryotic cells. In Archea, we can see a simple structure of chromatin. Not only eukaryotes, but others also use nucleosomes was proved by this structure.

Want to know more about Nucleosomes?Click here to schedule live online session with e Tutor!

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Reference Links:

- http://en.wikipedia.org/wiki/Nucleosome
- http://en.wikipedia.org/wiki/Histone
- http://www.accessexcellence.org/RC/VL/GG/nucleosome.php
- http://www.callutheran.edu/Academic_Programs/Departments/BioDev/omm/nucleosome/nucleosome.htm
- http://www.youtube.com/watch?v=v9Zok3bKmOQ

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