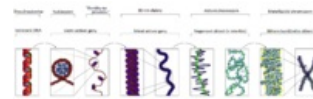


Chromatin

Chromatin, or nuclear material, is a complex of DNA and proteins that together form a nucleohistone (chromosome) thread. In the nucleus, where nuclear division does not take place, chromatin is found in 2 forms, heterochromatin and euchromatin.



Chromatin Structures

Heterochromatin and Euchromatin

If we stained the nuclear mass with nuclear dyes, "euchromatin" appears as a lighter, i.e. more transcriptionally active part (the fiber is more relaxed) when stained with nuclear dyes. The parts that turn darker are called *heterochromatin*, they are places where transcription is not active. Heterochromatin is further divided into:

- constitutive – permanently inactive sections of DNA (typical are large heterochromatin blocks on chromosomes 1, 9, 16 and Y^[1]);
- optional - currently inactive sections (under certain conditions they can resume their function) e.g. developmental genes.

Structure of Chromatin

- DNA
- Specific proteins - Histones and non-histone proteins

The DNA double helix is wrapped around the histone octamers H2A, H2B, H3, H4. Histone H1 forms a link between these formations. This whole thing together (DNA, histone octamer and histone H1) forms a '*nucleosome*'.

Nucleosome

It represents the basic building block of the chromosome (nucleohistone) fiber. Several nucleosomes in a row form formations similar to beads on a thread - so-called polynucleosomes.

Histones

 For more information see *Histones*.

In addition to the construction function, they also have a regulatory function. It forms the histone code. They are involved in the regulation of gene expression as one of many epigenetic modifications.

E.g.:

- **methylation** of a lysine residue on H3 stops expression
- **acetylation** of a lysine residue on H3 initiates transcription
- and others: phosphorylation, ubiquitination, ADP ribosylation affecting expression regulation as well as chromatin condensation and decondensation

Links

ws:Chromatin

Related Articles

- Chromosomes
- Histones
- Transcript
- Epigenetics

References

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