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Commentary

A note on structure and functions of chromatin

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DESCRIPTION

Chromatin is a chromosome that makes up DNA and proteins. The major proteins in chromatin are proteins called histones. They act as DNA packing materials. The reason that chromatin is so important is that it is an excellent packaging technique to get the entire DNA inside a cell. If a person were to take DNA within a single cell and stretch it out to the end, it would be a yardstick in length. Each cell is about a hundred millimetres in diameter, so it is an excellent task to pack a DNA field within something one hundred millimetres in diameter. And chromatin does just that by wrapping and wrapping DNA around the strongest coil. And that arrangement is called chromatin.

Structure of chromatin

The structure of chromatin is controlled by a few factors. The complete structure depends mainly on the phases of the cell cycle. They undergo various structural changes during cell division. The formation of chromosomes is clearly seen under a bright microscope in the middle of metaphase, which changes shape when DNA is duplicated and divided into two cells.

There are 3 stages in the chromatin group:

1. Nucleosomes are formed by binding DNA to histone proteins.

2. Most histones wrap into a 30 nm fiber that binds to the nucleosome.

3. High-density DNA packing of 30 nm fiber to the metaphase chromosome.

Functions of chromatin

• Initially, chromatin was considered a color-coded substance in the nucleus of a cell. Later, it was discovered that it is not just a colourful object but one of the most important principles of DNA expression. Chromatin formation also plays an important role in DNA replication. DNA packing into chromatin and nucleosome results in a tightly closed structure that is inaccessible to enzymes responsible for transcribing, duplicating, and repairing DNA.

• The packaging of the DNA structure is textual compression and allows for a basic level of genetic expression only. With open or disrupted nucleosome structures, DNA can be easily replicated and transcribed.

• During the transcription process, the chromatin structure is altered by certain pressures and traps that interact with RNA to regulate genetic function. Activators alter the structure of the nucleosome leading to the stimulation of RNA polymerase synthesis. During replication, similar control of chromatin structure occurs, which allows the replication process to be in the original source.

• Chromatin also plays a role in regulating gene expression. Using a stand-alone variegation process, genes can be transformed into inactive ones by placing them next to silent heterochromatic chromatin. The distance between the heterochromatin chromatin and

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the genetic variant can be as much as 1000 kielbasas of pairs. This condition is called epigenetic because it produces a variety of phenotype.

• Scientists have suggested that the highly concise nature of heterochromatin inhibits DNA transcription. However, it is not yet fully understood how neighbouring non-heterochromatic regions are affected. The researchers found that the proteins in chromatin could spread to neighbouring regions to produce the same stress effect. Researchers also suggest that there may be other cells in the nucleus that do not have access to the writing features where heterochromatin may be located. Therefore, chromatin in the nucleus may not be directly accessible to the transcription factors.