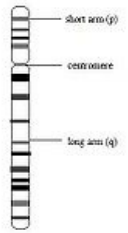


Eukaryotic Chromosomes

The **eukaryotic chromosomes** are more complicated than procaryotic. They encode more information (coding and non-coding parts) so we recognize bigger count of chromosomes in Eukaryota. Their count depends on the evolution of the species. But they structure is pretty similar.

DNA contains millions and millions of nucleotides and it is necessary *to compress* them. In eukaryotic chromosomes we recognize a process similar to supercoiling in Prokaryota. This is made possible by special proteins – **histones** – which packed the DNA strand. Complex of DNA and these proteins is called **chromatin**.

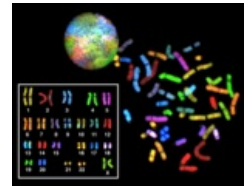
DNA is turning around the histones. Sometimes it is said that it looks like the **beads on a string**. This is a principle, which allows to get so long DNA strand (human DNA has more than 2 metres) into the cell and chromosomes.



Chromosome structure

Structure of Chromosomes

We recognize few parts of chromosomes. But it is necessary to say, that the shape of the chromosomes is changing during the cell division. The classic shape which is well-known is typical just for the short part of the division – for **mitosis**, especially its metaphase. In this phase the chromosomes are the most compact. During the interphase they are pretty hackney and they look like very long and thin fiber.

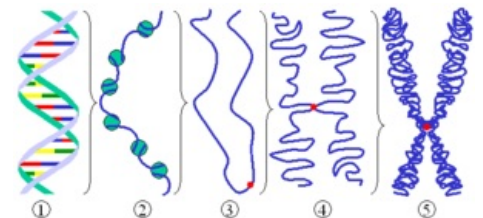


Karyotype

Compact chromosome has *3 main parts*. Centromere and two arms:

Centromere

- is a middle part that connect both arms together. It is very important also during cell division because it is the place where kinetochor is binding. It is a very important complex which binds a mitotic spindle. All of this serve to the separation of chromosomes.



Chromatin structure

Short and long arms

- *short arm* of the chromosome is also marked by letter **(p)**, according to French "*petit*" (means small)
- *long arm* of the chromosome is marked by **(q)** – according to the letter which follow (p)
- the terminal parts of arms have their own name – they are called **telomeres**

Sorting of Chromosomes

Chromosomes are normally *colorless* but we are able to dye them (Giemsa dye). Then we get the picture of stripted chromosomes. Why? The dye binds more to parts which are rich of *adenin* (A) and *thymine* (T) bases. This should be very usefull for scientists who are looking for some chromosomal abnormalities. The shift of some segments is connected with the change of banding.

We should recognize individual chromosome also in another way - with the **fluorescent** colors. We should choose a different color for specific parts of the chromosome. Then each pair of homologous chromosome is getting different color. Then it is very easy to sort them.

Links

Related articles

- Prokaryotic Chromosomes
- Histone
- Chromatin
- DNA
- Mitosis
- Human Chromosomes (Karyotype)

Bibliography

- ALBERTS,, et al. *Základy buněčné biologie*. 2.vydání edition. 1998. ISBN 80-902906-2-0.

