EUCHROMATIN & HETEROCHROMATIN

The nucleus contains nucleoplasm. There is a network of fibrils in nucleoplasm. This net work of fibril like structure may retain some stain and known as Chromatin.

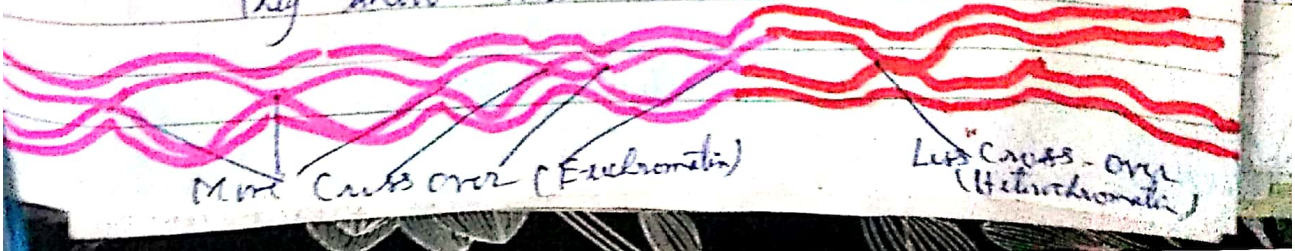
Thus chromatin stands for the chemicals present in nucleoplasm which may retain nuclear stains i.e. Feulgen or Aceto carmine or Haematoxylene etc.

There are two forms of the Chromatin

i) Euchromatin
ii) Heterochromatin.

i) Euchromatin.

The non condensed regions of chromosome are known as Euchromatic regions. It contains fibrils of 30-80 A°. They remain uncondensed during interphase. These are active parts also. They get light stain. They are present in diffused or loosely coiled portion of chromosomes. They replicate during early stage of Synthetic phase of cell cycle. They possess acetyl group in their histones.
Euchromatin is partially composed of non-repetitive DNA sequences which take part in synthesis of m-RNA during Interphase. They are mostly found near secondary constriction, primary constriction. They never show heteropycnosis. They show more cross-overs.



ii) **Heterochromatin**: They show heteropycnosis. They are composed of 250 Å fibrils. It is a condensed coiled state of chromatin containing two to three times more than the euchromatin. They are genetically inactive. They ~~are~~ do not take part in the synthesis of RNA and proteins. They get dep stains. Found in condensed regions as Telomere, Centromere, Satellitete. They replicate at the end of Synthetic phase of cell cycle. They are more labile. They are metabolically less active. They show low crossover.

There are its two types of

a) Constitutive &
b) Facultative.

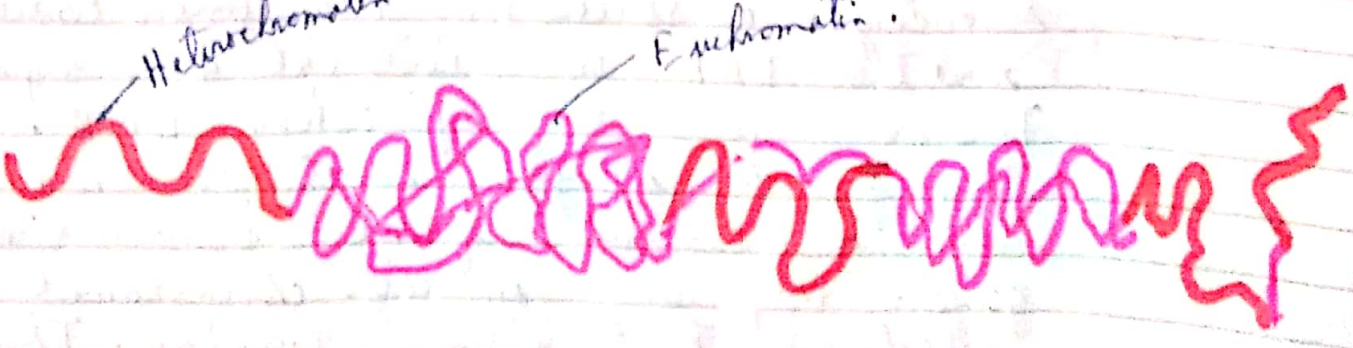
a) **Constitutive Heterochromatin**: Most common are present in nuclei of all of the cells. They are normally found in blocks, near telomere, centromere and secondary constrictions. They ~~are~~ both consist of repetitive DNA or identical genes segment. These are late ~~rel~~ replicating DNA. They provide strength to centromere. They also act as spacer between vital genes. They help in the chromosomal attachment to nuclear envelope. They are helpful in pairing of homologous chromosomes during Meiosis. Polygenes coding for r-RNA, making 5-S r-RNA and t-RNA are found localized in this region.

b) Facultative Heterochromatin:

It is for the time being, Eu chromatinized by a process known as Facultative Heterochromatisation. Part or whole of chromosome or set of chromosomes become Heterochromatic in cells of one sex while the chromosomes of opposite sex remain euchromatic e.g. In females of mammals including human being. One of X-chromosome becomes inactive forming Sex-chromatin or Barr body at interphase.

In some of the insects also one of two X-chromosome become heterochromatic and the other remains euchromatic.

Up to date till now they are not reported in plants.

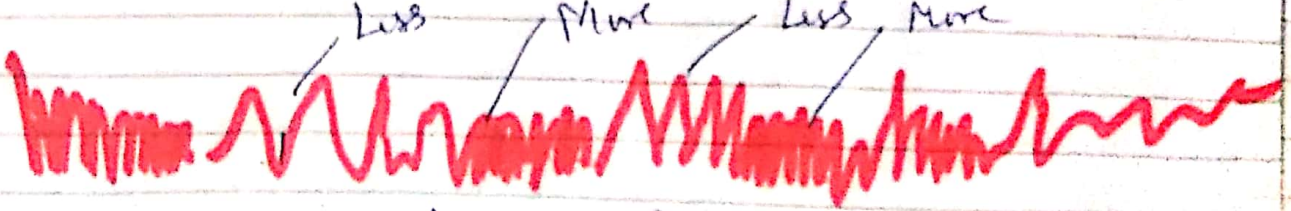


Heteropycnosis: Differences in the thickening of chromosomes are known as heteropycnosis.

It is a common phenomenon. A set of chromosomes, a chromosome or certain parts of chromosomes may be more or less condensed than the other set, chromosome or part, portion of chromosome.

Thus heteropycnosis may be positive or negative. The positive one due to over condensation and the negative one due to undercondensation.

Normally chromosomes get enlarged or uncondensed during interphase. But in certain cases e.g. sex chromosomes remain condensed during interphase also. Such chromosomes are known as Heterochromosomes.



Thickening Patterns.

Diagram Showing Heteropycnosis