

Structure of chromosome

Physical structure

and depends upon the position of centromere. A typical chromosome has the following parts:

(i) pellicle — outer covering and non genetic material

(ii) chromonemata — it is a sub-chromatid in nature. It is said to have as the gene behaving portion of chromosome. It has paracentric and plectonemic. (By-vejdovsky)

(iii) centromere — it is also known as primary constriction and its position determines the shape of chromosome.

position of centromere

Type of chromosome

(a) centromere (Terminal)

— Telocentric

(b) in middle

— metacentric

(c) submedian

— submetacentric

The Number of centromere -
particular chromosome is constant but
may be vary.

Single centromere ✓

Mono centric ✓

Two ✓

Di centric ✓

Three ✓

Tri centric ✓

Many ✓

polycentric ✓

No - ✓

Acentric ✓

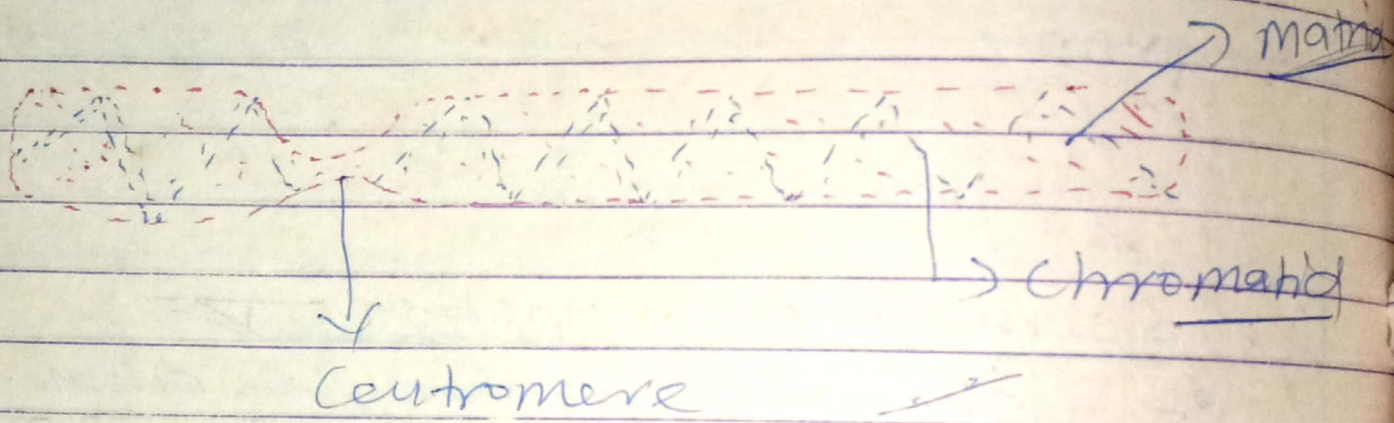
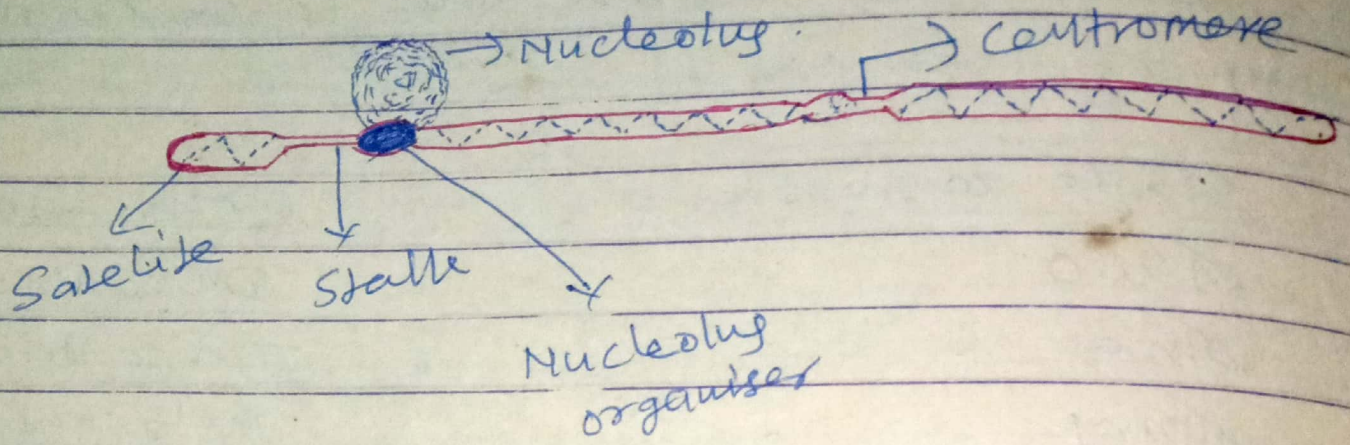
Secondary Constriction

It shows Angular deviation. It is present in only some pair of chromosome. Here Nucleolus are attached, so it is called Nuclear organising region. Usually only one Secondary Constriction is present in each chromosome.

Satellite — It is a round body attached by chromatin fibres to secondary constriction region. The chromosome where satellite is internal is known as SAT chromosome.

Telome — It is the end position of a chromosome. It shows polarity in

prevents the chromosome from joining.

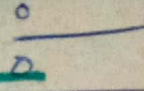


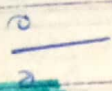
"Structure of chromosome"

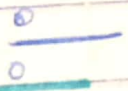
Function of centromere:

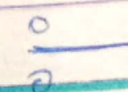
Centromere or primary constriction have two important functions

- (i) Mechanism to hold two sister chromatids together until the end of Metaphase.
- (ii) To maintain site for the attachment of spindle fibres in order to transport the sister chromatids to opposite pole.

Kinetochore  It is the chromatin fibres of the centromere region that act to hold the sister chromatids together while attachment of each chromatid to spindle is mediated by special dense structure called kinetochore. It is coin shaped in mammal and ball shaped in plants.

Chromatid  Chromosomes divide length wise into two halves during cell division. Each part is called - chromatid.

Chromomeres  on chromomeres, there are several bead like - areas of increased density dispersed along them is known as chromomeres. These chromomeres appear as bands in salivary glands of giant chromosome of drosophila.

Satellite  The small segment of the chromosome distal to this secondary constriction is called Satellite.

Two or more chromosomal fibres are coiled together in paranemical (during meiosis) or plectonemical (during mitosis) (fashion).