

Chromatid

- ❖ Each metaphase chromosome appears to be longitudinally divided into two identical parts each of which is called **chromatid**.
- ❖ Both the chromatids of a chromosome appear to be joined together at a point known as **centromere**.
- ❖ The two chromatids of chromosome separate from each other during mitotic anaphase (and during anaphase II of meiosis) and move towards opposite poles.
- ❖ Since the two chromatids making up a chromosome are produced through replication of a single chromatid during synthesis (S) phase of interphase, they are referred to as **sister chromatids**.
- ❖ In contrast, the chromatids of homologous chromosomes are known as **non-sister chromatids**.

Centromere (Primary constriction)

- ❖ Centromere is the landmark for identification of chromosome.
- ❖ Each chromosome has a constriction point called the **centromere** (Synonym: **Kinetocho**re), which divides the chromosome into two sections or arms.
- ❖ The **short arm** of the chromosome is labeled the "**p**" arm. The **long arm** of the chromosome is labeled the "**q**" arm.

Telomere

- ❖ The two ends of a chromosome are known as telomeres, they play critical roles in chromosome replication and maintenance of chromosomal length.
- ❖ The telomeres are highly stable and telomeres of different chromosomes do not fuse.
- ❖ The telomeric region of chromosome is made up of repeatative sequence of **T** and **G** bases

Secondary constriction

- ❖ In some chromosome addition to centromere / primary constriction, one or more constrictions in the chromosome are present termed secondary constrictions.

Satellite

- ❖ The chromosomal region between the secondary constriction and nearest telomere is called as satellite and chromosomes that possess this region called as **satellite chromosome** or **sat chromosome**.
- ❖ A small chromosomal segment separated from the main body of the chromosome by a secondary constriction is called **Satellite**.

Centromere positions

Size of the chromosome

- ❖ The size of the chromosome varies from stage to stage of cell division.
- ❖ The chromosomes are the **longest and thinnest during interphase** (resting stage) and hence not visible under light microscope.
- ❖ Chromosomes are the **smallest and thickest during mitotic metaphase**.
- ❖ Chromosome size is **not** proportional to the number of genes present on the chromosome.
- ❖ The location of the centromere on each chromosome gives the chromosome its characteristic shape.

The DNA + histone = chromatin

- ◉ The DNA double helix in the cell nucleus is packaged by special proteins termed histones.
- ◉ The formed protein/DNA complex is called chromatin.
- ◉ The structural entity of chromatin is the nucleosome.

