

INTRODUCTION

- E. Strasburger in 1875 first discovered thread-like structures which appeared during cell division.
- These thread like structures were called chromosomes due to their affinity for basic dyes.
- The term chromosome is derived from two Greek words; chrom = colour, soma=body.
- This term was first used by Waldeyer in 1888.
- Chromosomes contributed to the division of cells and they are of prime importance as they carry the genes which are the hereditary material.

CHROMOSOME SIZE

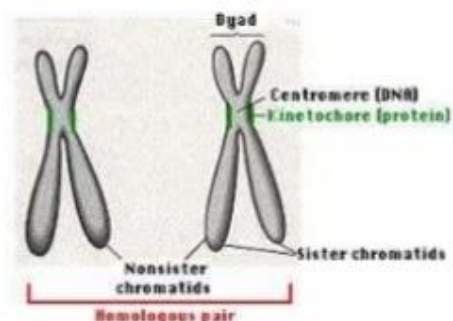
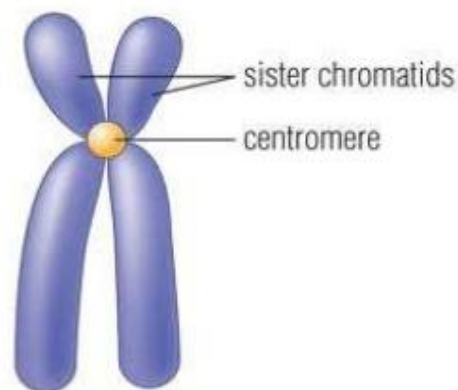
- The size of the chromosome shows a remarkable variation depending upon the stage of cell division.
- longest and thinnest during interphase and hence not visible under light microscope.
- smallest and thickest during mitotic metaphase.
- Chromosome size is not proportional to the number of genes present on the chromosome.

CHROMOSOME MORPHOLOGY

- The outer covering or sheath of a chromosome is known as pellicle, which encloses the matrix.
 - Within the matrix lies the chromatin.
 - **Flemming** introduced the term chromatin in 1879.
 - The chromosome morphology changes during cell division and mitotic metaphase is the most suitable stage for studies on chromosome morphology.
- ✓ In mitotic metaphase chromosomes, the following structural features can be seen under the light microscope.
1. **Chromatid**
 2. **Centromere**
 3. **Telomere**
 4. **Secondary constriction**
 5. **Chromomere**
 6. **Chromonema**
 7. **Matrix**

Chromatid

- Each metaphase chromosome appears to be longitudinally divided into two identical parts each of which is called **chromatid**.
- Chromatids of a chromosome appear to be joined together at a point known as **centromere**.
- Two chromatids making up a chromosome are referred to as **sister chromatids**.
- The chromatids of homologous chromosomes are known as **non-sister chromatids**.



Centromere:

- The region where two sister chromatids appear to be joined during mitotic metaphase is known as **centromere**
- It generally appears as constriction and hence called **primary constriction**.
- helps in the **movement of the chromosomes to opposite poles** during **anaphase** of cell division.
- The centromere consists of two disk shaped bodies called **kinetochores**.
- Normally chromosomes are **monocentric** having one **centromere** each.

Depending on position of the centromeres, chromosomes can be grouped as:

- a) Metacentric:** Centromere is located exactly at the centre of chromosome, Such chromosomes assume 'V' shape at anaphase.
- b) Submetacentric:** The centromere is located on one side of the centre point such that one arm is longer than the other. These chromosomes become 'J' or 'L' shaped at anaphase.
- c) Acrocentric:** Centromere is located close to one end of the chromosome and thus giving a very short arm and a very long arm. These chromosomes acquire 'J' shape or rod shape during anaphase.
- d) Telocentric:** Centromere is located at one end of the chromosome so that the chromosome has only one arm. These chromosomes are 'I' shaped or rod shaped.

TO BE CONTINUED.....

DR ANITA KUMARI

L.S. COLLEGE