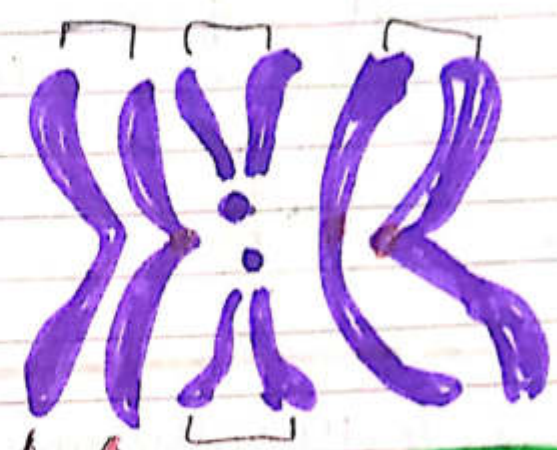
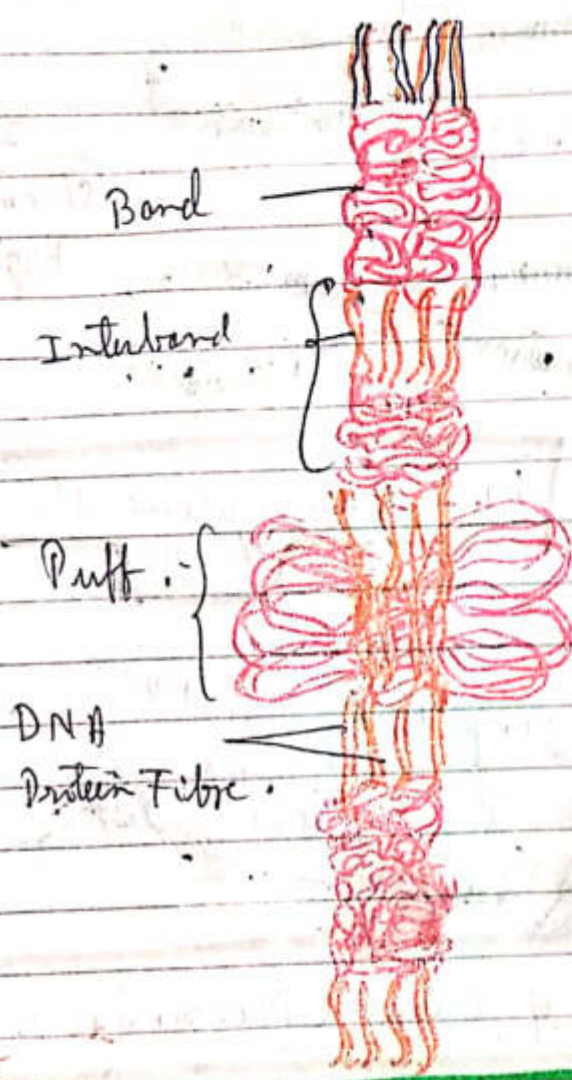
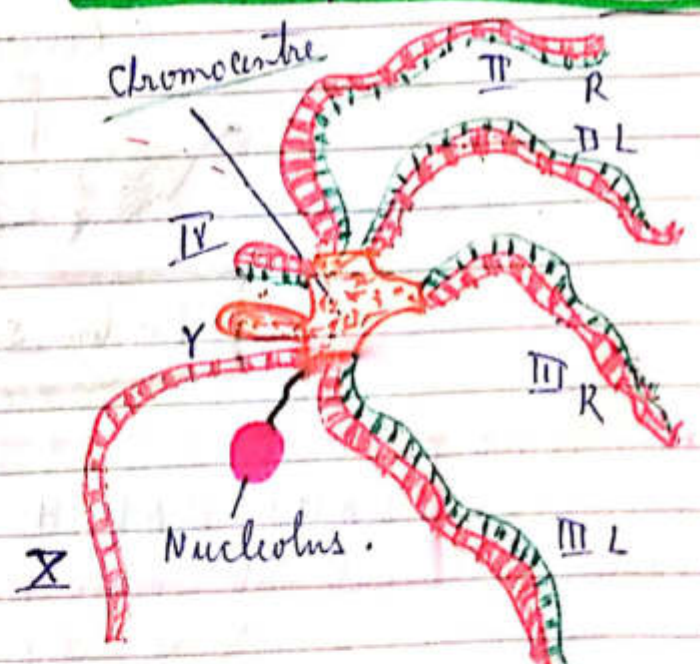


# GIANT CHROMOSOMES (continued)



4 - Pairs of Somatic Chromosomes

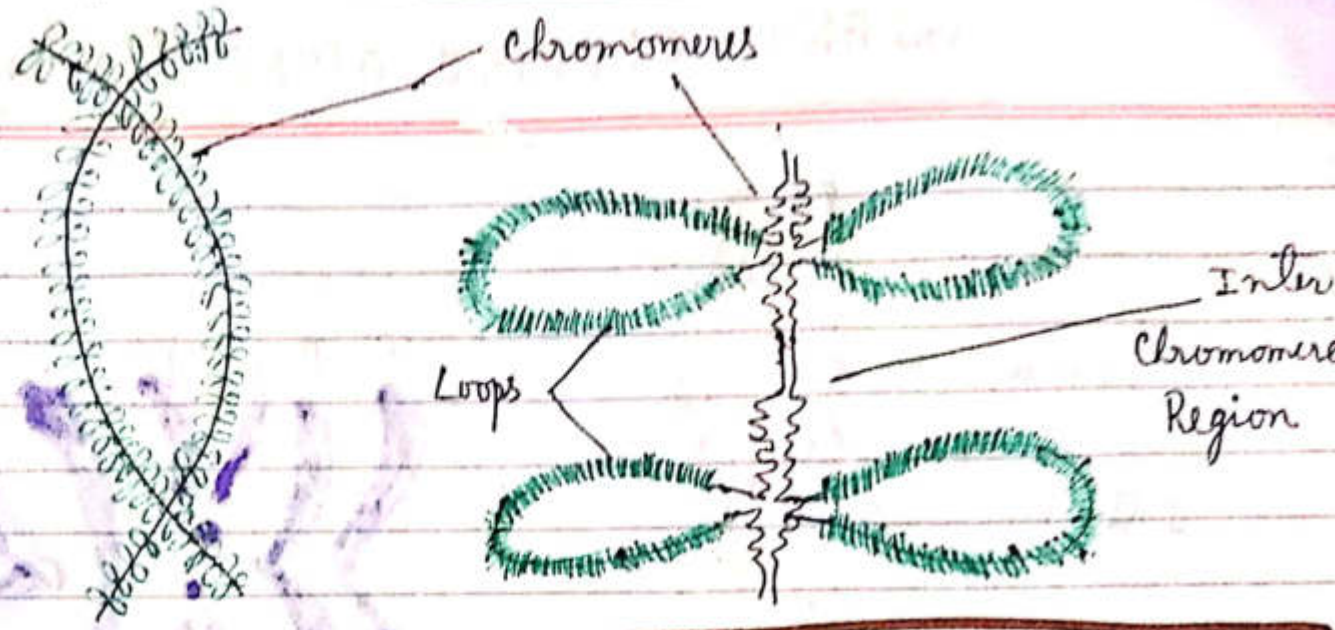
Band and Interband in a Giant Chromosome



POLYTENE CHROMOSOMES of *Drosophila*

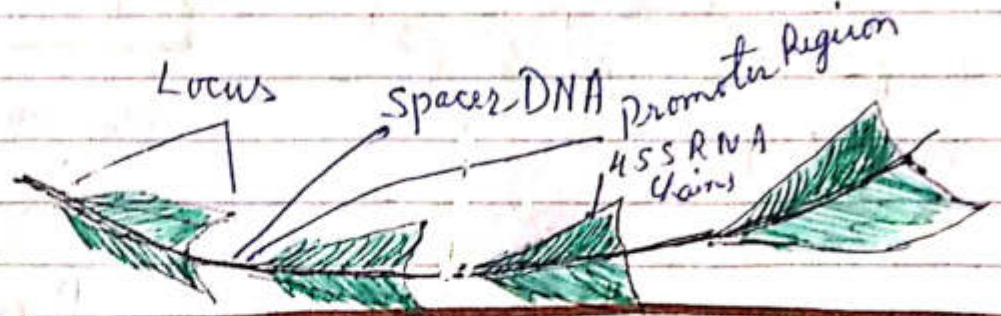
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# LAMP BRUSH CHROMOSOMES



A Pair of Meiotic Chromosome

A part of chromosome showing Loops



Tandem series of Genes (Diagrammatic).

## LAMP BRUSH CHROMOSOME (DIAGRAMATIC)

Discovered by Flemming (1882) and later named by Ruckert (1892).

They are found in both plants and animals including both invertebrates & vertebrates as, Sepia, Sagitta, Echinaster, Insects, Snails, Amphibians, Reptiles & birds. The vertebrate ones are quite larger than invertebrates.

Size may vary from 1000  $\mu$  to 6000  $\mu$  (5900 in Salamander).

They are highly elastic may be stretched even up to two times of their size.

They are also enlarged during Prophase I of Diakinesis and highly reduced during Metaphase I.

Structure: They are seen in pairs (homologous). Each chromosome having two chromatids representing

Axial filament The chromatids represent are in form of Axial Filament.

They look like brush. Hence named as in early days the brushes to clean oil lamp chimney are common.

Chromomere: The axial filaments are tightly coiled at certain points, known as chromomeres which are found in pairs, McRis (1957) they are like heterochromatin.

Loop: The axial filaments extend laterally and form loop on both sides. Each loop is made up of an axial fibre covered with matrix.

The axis is made up of DNA whereas matrix is made up of RNA.

Their size is between 5-100  $\mu$ m.

Loops are of two Types.

- a) Typical
- b) Special.

a) Typical Loop: There is a central axis which gives off fibrils of RNA of progressively increasing lengths making the loop thicker on one side.

b) Special Loop: They have granules at the fibrils. They show asymmetry.

### Ultra Structure:

Electron microscopy shows that  
 Alc Miller & Beatty (1969)

- There are dense granules on the DNA of axial filament fibre. These granules may be large molecules of the enzyme RNA polymerase synthesizing RNA and RNA-protein (Ribonucleoprotein).

The loop may represent a long operon consisting of a series of identical copies of same structural genes (cistrons).

Alc Callan & Lyod (1960) Each pair of loops is associated with the activity of a specific gene. There are several identical copies of genes in each loop.

The genes at chromomeres are known as Master Genes and its copies on loop are known as Slave Genes. Only Slave genes form RNA synthesize RNA. Master Genes do not do this.

It has been assumed that the loop continually spin out from chromomere at the thin end and rewinds at the thick end.