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Class: Deg.I(subs.)  
Topic: Cell-division: Meiosis(contd.)  
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## **CELL-DIVISION: MEIOSIS(Continued):**

### **Pachytene stage of Meiosis:**

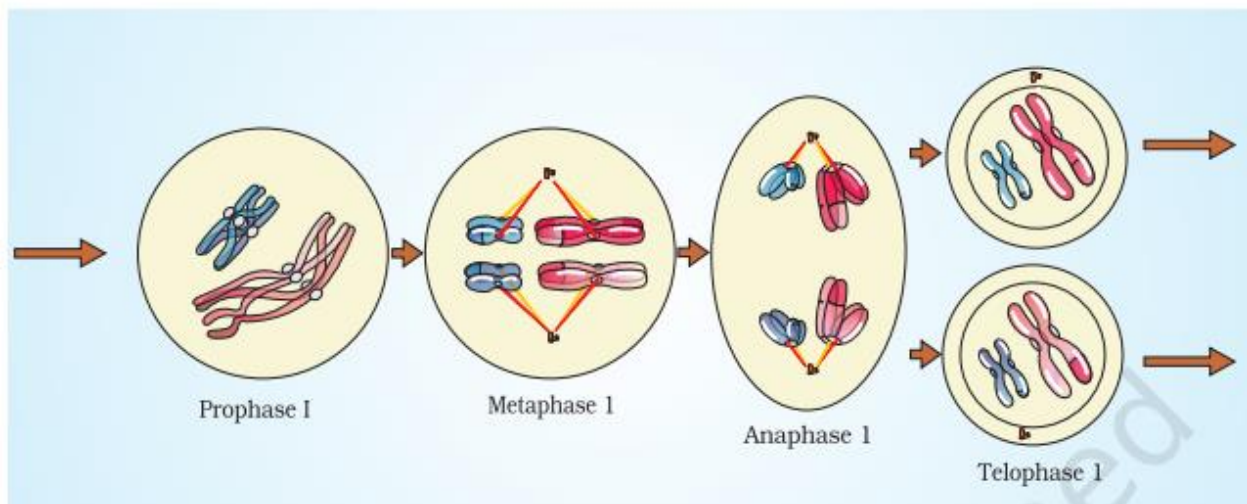
During **pachytene** stage, the four chromatids of each bivalent chromosomes becomes distinct and clearly appears as tetrads. This stage is characterized by the appearance of recombination nodules, the sites at which crossing over occurs between non-sister chromatids of the homologous chromosomes. **Crossing over** is the exchange of genetic material between two homologous chromosomes. Crossing over is also an enzyme-mediated process and the enzyme involved is called **recombinase**. Crossing over leads to recombination of genetic material on the two chromosomes. Recombination between homologous chromosomes is completed by the end of pachytene, leaving the chromosomes linked at the sites of crossing over.

The beginning of **diplotene** is recognised by the dissolution of the synaptonemal complex and the tendency of the recombined homologous chromosomes of the bivalents to separate from each other except at the sites of crossovers. These X-shaped structures, are called **chiasmata**. In oocytes of some vertebrates, diplotene can last for months or years.

The final stage of meiotic prophase I is **diakinesis**. This is marked by terminalisation of chiasmata. During this phase the chromosomes are fully

condensed and the meiotic spindle is assembled to prepare the homologous chromosomes for separation. By the end of **diakinesis**, the nucleolus disappears and the nuclear envelope also breaks down. **Diakinesis** represents transition to metaphase.

**Metaphase I:** The bivalent chromosomes align on the equatorial plate. The microtubules from the opposite poles of the spindle attach to the kinetochore of homologous chromosomes.



(Fig.- Stages of Meiosis I)

**Anaphase I:** The homologous chromosomes separate, while sister chromatids remain associated at their centromeres.