

MITOSIS

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It is the type of cell division in which number, of chromosome remains same in daughter cells as compared the parental cell.

In Plants and Animals:

In spite of slight differences, major of steps of mitosis are similar in plants as well as in animals. The main events discussed are mainly based on the animal cells.

Occurrence:

Mitosis can take place in diploid as well as haploid cells.

PHASES OF MITOSIS

Mitosis is a continuous process, but for the sake of convenience it may be divided into two main phases:

1. **Karyokinesis:** Which involves the division of nucleus.
2. **Cytokinesis:** that refers to the division of the whole cell.

1. KARYOKINESIS:

This is the first main process of the mitosis during which one nucleus divides into two nucleoli through an intricate series of events.

Stages of Karyokinesis:

Karyokinesis can further be divided into four main phases, which are

- (a) Prophase (b) Metaphase (c) Anaphase (d) Telophase.

During Interphase (Non – dividing) of the cell cycle the chromosomes are not visible even with electron microscope, but using histological stains for DNA, network of very fine threads can be visualized. This network is called as **chromatin**.

Prophase:

It is a lengthy phase and a large number of events take place during this phase.

Events:

1. At the beginning of the process, the partition of the centrioles take place which have been duplicated during interphase but were in the same centrosome.
2. Early in the mitosis the two pairs of centrioles separate and migrate to opposite sides of the nucleus, establishing the bipolarity (having two poles) of the dividing cells.
3. The chromatin material gets condensed as a result of folding, coiling and super coiling.
4. The chromosomes appear as thin threads (0.25 μ m – 50 μ m in length) at the beginning of prophase. Chromosomes become more and more thick and their visibility increases.
5. Each chromosome is already duplicated i.e., having two sister chromatids, attached at centromere. A special base sequence and a protein part kinetochore is present at the centromere.
6. Mitotic apparatus is formed during this phase.

MITOTIC APPARATUS

This is a specialized structure formed by various kinds of microtubules and two pairs of centrioles. This structure is larger than the nucleus.

Three sets of microtubules (fibers) originate from each pair of centrioles. These are: