

MITOSIS

Mitosis is a type of cell division where the parent nucleus divides into two daughter nuclei each having the same number of chromosomes as the parent cell. Before the active division occurs, the cell first undergoes interphase. During Interphase there is replication of chromosomes, storage of ATP for the mitotic cell division and replication of organelles.

Thus Mitosis is divided into Prophase, Metaphase, Anaphase and Telophase.

Prophase

During this phase the chromosomes first appear as thin threads that are not divided into chromatids and the centromeres are not visible. Then the chromosomes become shorter and thicker and each appears to have two chromatids joined by a centromere. Then the nuclear membrane breaks down and the chromosomes are spread out in the cytoplasm. In animals and lower plants a spindle is organized in the cytoplasm by the centrioles.

Metaphase

The chromosomes come to lie on the equatorial region of the spindle.

Anaphase

The 2 chromatids of a chromosome separate at the centromere and begin to migrate in opposite directions towards either end of the spindle led by their centromeres and reach the ends of the cell.

Telophase

The chromatids are collected at the opposite ends of the cell and are then known as chromosomes.

The spindle disappears and a nuclear membrane forms around each group of chromosomes. resulting into 2 nuclei .

In animal cells, the cytoplasm between the two nuclei constricts and two daughter cells are formed each having the same number of chromosomes as the parent cell. The cells may retain the ability to divide or may become specialized for different functions like support(bone cells), protection(epithelial cells), storage(fat cells) and others.

In plant cells, the cytoplasm does not constrict to form two new cells; instead a new cell wall is formed across the cell in the region originally occupied by the equatorial plate of the spindle. Then two daughter cells are formed each having the same number of chromosomes as the parent cell.

ASSIGNMENT

- i) Draw the diagrams of the main stages of mitosis in an animal cell.(page 178 Introduction to Biology
- ii)What is the significance of mitosis to living organisms.