

Mitosis Overview

- Mitosis is a continuous process of cell division which occurs in all types of living cells.
- Mitosis involves four basic phases – prophase, metaphase, anaphase and telophase.
- Mitosis is the process where the division of cell occurs by asexual reproduction.
- In mitosis, the nuclear membrane is broken down, spindle fibres (microtubules) attach to the chromatids at the centromere and pull apart the chromatids.
- When the chromatids reach separate ends of the cells, the spindle fibres disintegrate and a nuclear membrane rebuilds around the chromosomes making two nuclei.
- Each nucleus is identical to the original nucleus as it was in G₁ phase.

Also read: [Difference between haploid and diploid](#)

Meiosis Overview

- Meiosis is the form of nuclear cell division that results in daughter cells that have one-half the chromosome numbers as the original cell.
- In organisms that are diploid, the end result is cells that are haploid. Each daughter cell gets one complete set of chromosomes, i.e., one of each homologous pair of chromosomes.
- In humans, this means the chromosome number is reduced from 46 to 23.
- The germ cells undergo meiosis to give rise to sperm and eggs.
- The joining together of a sperm and egg during fertilisation returns the number of the chromosomes to 46.
- Cells that undergo meiosis go through the cell cycle, including the S phase, so the process begins with chromosomes that consist of two chromatids just as in mitosis.
- Meiosis consists of meiosis I and meiosis II. In meiosis I, homologous chromosomes are separated into different nuclei.
- This is the reduction division; chromosome number is divided in half. Meiosis II is very similar to mitosis; chromatids are separated into separate nuclei.
- As in mitosis, it is spindle fibres that “pull” the chromosomes and chromatids apart in meiosis.
- The end result of meiosis is four cells, each with one complete set of chromosomes instead of two sets of chromosomes.

Similarities Between Mitosis and Meiosis

- Both mitosis and meiosis take place in the cell nuclei, which can be observed under a microscope.
- Both mitosis and meiosis involve cell division.
- Both the processes occur in the M-phase of the cell cycle. In both cycles, the typical stages are prophase, metaphase, anaphase and telophase.
- In both cycles, synthesis of DNA takes place.

Also Read:

- [Meiosis I](#)
- [Meiosis II](#)

Conclusion

The difference between Mitosis and Meiosis is quite apparent. They are two very different processes that have two different functions. Meiosis is required for genetic variation and continuity of all living organisms. Mitosis, on the other hand, is focused on the growth and development of cells. Meiosis also plays an important role in the repair of genetic defects in germline cells.