

CHAPTER 06

Reproduction

Cell division:

Cell division in human beings:

- Continuation of life starts from cells either those of the general body or the sex cells (gametes).
- A single cell divides many times and forms a multicelled organism.
- Unicellular bacteria and protozoa divide and increase in number.
- The injured tissues are replaced by new cells through cell division.
- Thus, cell division is one of the most important activities in all organisms. In this lesson, you will study about the two kinds of cell division and the processes involved in them.
- Majority of cells in a multicellular organism grow and then can divide.
- However, the cells like the nerve and muscle cells of animals and guard cells of plants do not divide. The process of cell division is almost same in all organisms.
- A cell passes through phases of growth after which are able to duplicate their chromosomes before they divide. These phases in the life of a cell constitute the cell cycle.

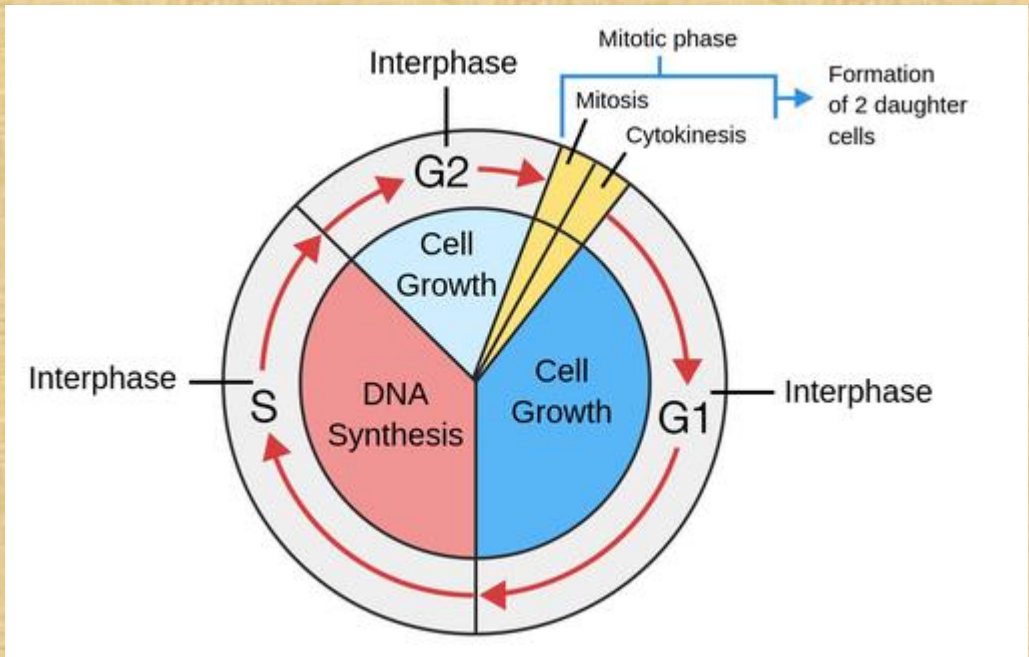
The cell cycle:

The cell cycle you can use the term mother or parent cell for the cell that undergoes division and the daughter cells for the ones that are the result of this division.

Before each daughter cell undergoes division, it must grow to the same size as its mother cell. We can distinguish two main phases in the life of a cell.

(i) Interphase – Non – dividing period (Growth phase)

(ii) Dividing phase - Also called M-phase (M for mitosis or meiosis)



I. Interphase – (Inter = in between):

- The interval between two successive cell divisions is termed interphase (phase at which the cell is not dividing). It is the longest period in the cell cycle.

The interphase subdivided into three main periods – G1, S and G2.

a) G1 (Gap-1) phase i.e. First phase of growth – This is the longest phase. Lot of protein and RNA are synthesised during this phase.

b) S or Synthetic phase – It comes next. Lot of DNA is (synthesised).

A chromosome contains a single double helical strand of DNA molecule. After S-phase, each chromosome becomes longitudinally double except at centromere, and thus, it has two molecules of DNA and two chromatids. Thus, each chromatid contains one molecule of DNA. The two chromatids are joined by a centromere (which does not divide at this stage) to form a single chromosome.

c) G2 (GAP 2) phase – More protein including the histones are synthesised in this phase. Cytoplasmic organelles such as mitochondria and Golgi bodies get duplicated. Centriole also divides into two centrioles contained in a single centrosome. **ii. II. M-phase or dividing phase:**

Represented by the symbol M (Mitosis or meiosis).

Mitosis occurs so that during this period the chromatids separate and form daughter chromosomes. The daughter chromosomes go to daughter nuclei and cytoplasm divides forming two identical daughter cells.