Fourth Lec. Cell cycle

The cell cycle is a process in which a cell grows and divides to create a copy of itself. Some organisms reproduce through the cell cycle, and in complex multicellular organisms, the cell cycle is used to allow the organism to grow, and to replace cells, as they grow worn out. In animals, the whole cell cycle takes around 24 hours from start to finish. Some cells, such as skin cells, are constantly going through the cell cycle, while other cells may divide rarely, if at all; neurons, for example, do not grow and divide once they are mature.

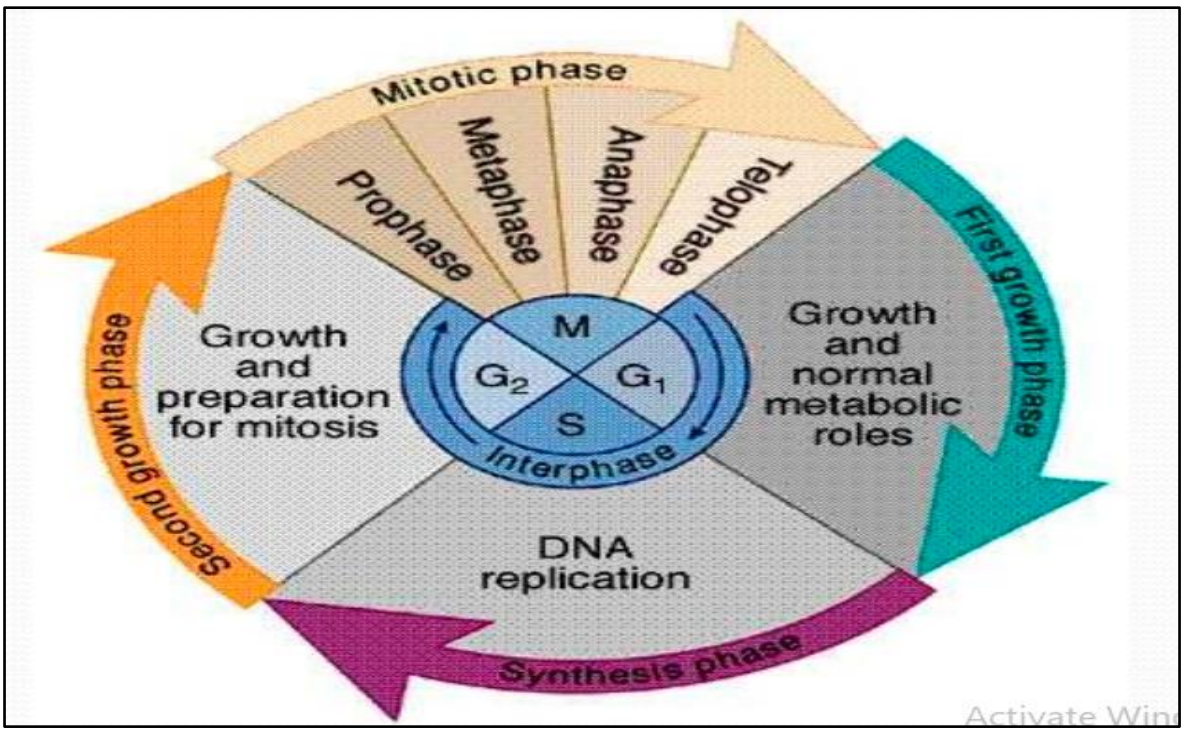
Phases of cell cycle

Cell cycle consist three phases;

1- G_1 phase-growth and synthesis
2- S phase- DNA synthesis phase
3- G_2 phase-Preparation for division

Interphase

4- Mitosis phase: includes the overlapping processes of mitosis and cytokinesis



G_1 Phase

Gap phase1begins at the completion of mitosis and cytokinesis and lasts until the beginning of S phase. This phase is generally the longest of the four cell cycle phases and is quite variable in length. During this phase, the cell chooses either to replicate its deoxyribonucleic acid (DNA) or to exit the cell cycle and enter a quiescent state (the G_0 phase).

S phase 2

Replication of the chromosomes is restricted to one specific portion of interphase, called S phase (DNA synthesis phase), which typically lasts about 6 h. In mammalian cells, the start of S phase- the actual initiation of DNA synthesis- takes place several hours after the cell has committed to carrying out DNA synthesis. During S phase, each chromosome replicates exactly once to form a pair of physically linked sister chromatids. In animal cells, a pair of centrioles is also duplicated during S phase.

G_2 Phase

The portion of interphase that follows S phase is called gap phase 2. Some cells can exit the cell cycle from G_2 phase, just as they can from G_1 phase. Combination of these three phases is known as interphase.

Mitosis

Mitosis is divided into five stages:

1- Prophase
2- Prometaphase
3- Metaphase
4- Anaphase
5- Telophase