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Lecture - 9

CELL DIVISION.

Growth involves increase in the size of organisms and increase in the No. of cells. Cell division is the process through which it is acheived. The new cells arise from pre-existing cells only through the process of cell division. It is essential for growth.

Type of cell Division.

1) Amitosis.
2). Mitosis &
3) Meiosis.

Amitosis occured in lower animal grs & plants. Mitosis occurs in somatic cells constantly; cells in the embryo, skin cells, gut lining cells etc.
Meiosis occurs in germ cells. It is reduction division in which the No. of chromosomes become haploid in gametes

MITOSIS

It is a process of nuclear divn in eukaryotic cells. Conventionally divided into five stages.
Mitosis produces two genetically identical cells. Mitosis is produced in somatic cells that now make up our body. Continues to generate new cells to replace dead & damaged cells.
Mitosis is ~~reff~~ referred to the following stages - Interphase, Prophase, metaphase, anaphase & Telophase.

INTERPHASE

- is the phase of cell cycle in which the cell spends the majority of its time & performs majority of its purposes including preparation for cell division.
- Earlier it was named resting phase. Once scientists discovered that the cell was doing the opposite the resting they changed the name resting to interphase.

- In preparation for cell division, it increases in size & makes a copy of its DNA, which is made during the S Phase.
- In this phase the cell obtains nutrients, grows, reads its DNA & conducts other "normal" cell function

PROPHASE

Chromosomes becomes very dense.
The nuclear envelope break down.
The spindles form at opposite poles of the cells.
Asters also form.

METAPHASE

- The chromosomes line up at the equator of the cell (metaphase plate) with centrioles at opposite ends.
- Spindle fibres attached to the centromeres.

ANAPHASE

- The centromeres divide.
- The sister chromatids (Paired chromosomes) separate and begin moving to the opposite poles of cell.
- The spindle fibres contract and the chromosomes are pulled to opposite poles.

TELOPHASE

- Two daughter nuclei form in the cell.
- Nuclear envelope are formed from the fragments of the parent cell's nuclear envelope and other ~~Syste~~ portions of the endomembrane system
- Nucleolus reappear.
- The chromosomes becomes less condensed.

NOTES

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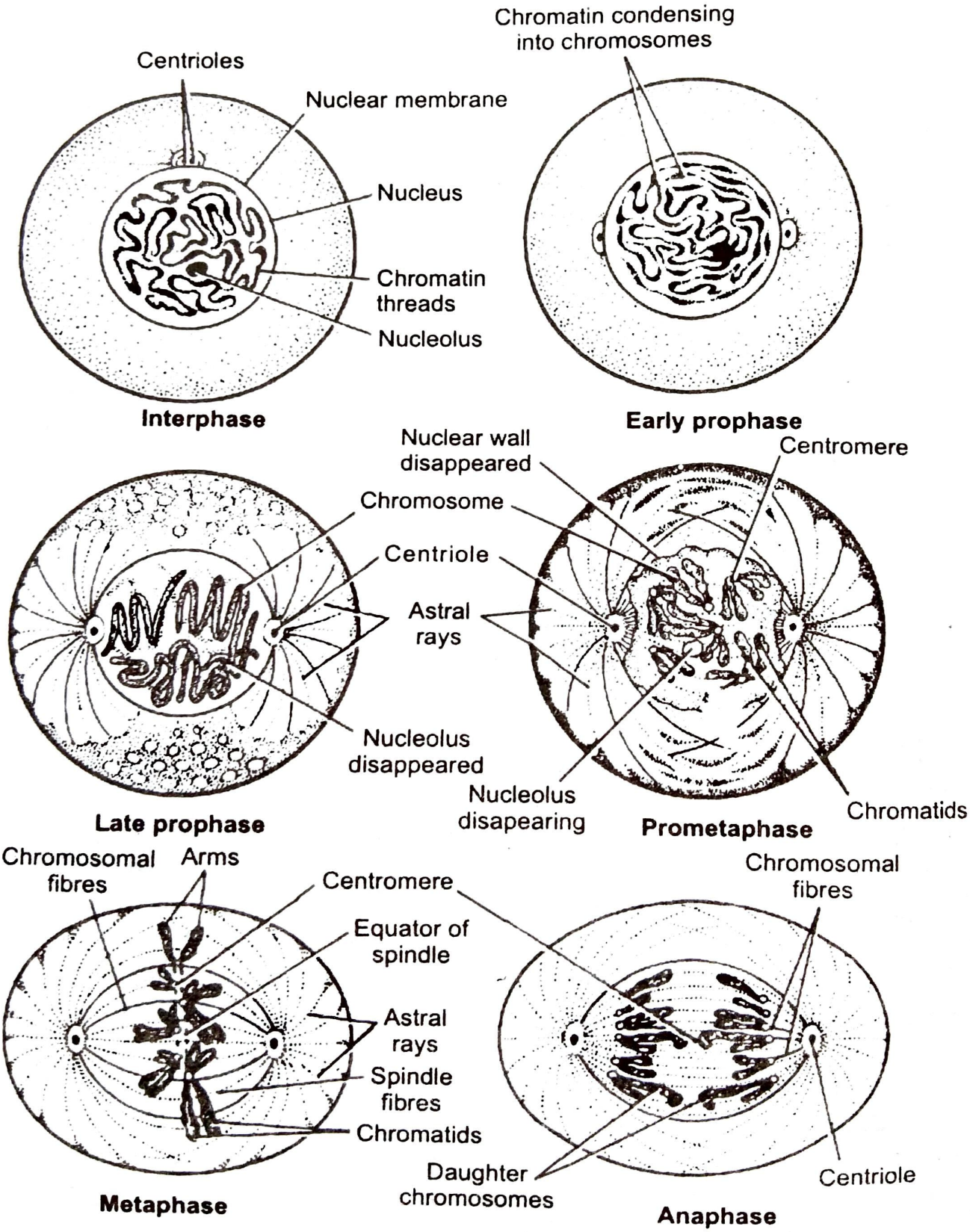
Cytokinesis

- The division of cytoplasm is usually almost complete by late telophase. So the two daughter cells appear shortly after the end of Mitosis.
- In animal cells, cytokinesis involves the formation of a cleavage furrow, which pinches the cell in two.
- In Plant cells, a cell plate forms & separates Daughter cells.

Diagrams.


Centrioles
Nuclear membrane
Nucleus
Chromatin threads
Nucleolus
Interphase
Chromatin condensing into chromosomes
Early prophase
Nuclear wall disappeared
Centromere
Chromosome
Centriole
Astral rays
Nucleolus disappeared
Late prophase
Nucleolus disapearing
Chromatids
Prometaphase
Chromosomal fibres
Arms
Centromere
Equator of spindle
Astral rays
Spindle fibres
Chromatids
Metaphase
Chromosomal fibres
Daughter chromosomes
Centriole
Anaphase