Basic Medical Science

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Fsc Technician 1

Cell Division

Overview

Cell division occurs when a parent cell divides into daughter cells.

Process

Part of the cell cycle.

One parental cell → two daughter cells.

Cell Division

- **Phases of Cell Division**
- Interphase
- Early Prophase
- Late Prophase
- Metaphase
- Anaphase
- Telophase
-
- **Outcome**
- Daughter cells divide and grow.
- A single parent cell gives rise to a population of cells.

Types of Cells Division

1-Mitosis

Produces identical daughter cells.

Occurs in most body cells (eyes, skin, hair, muscle).

2-Meiosis

Produces gametes (sperm and egg cells).

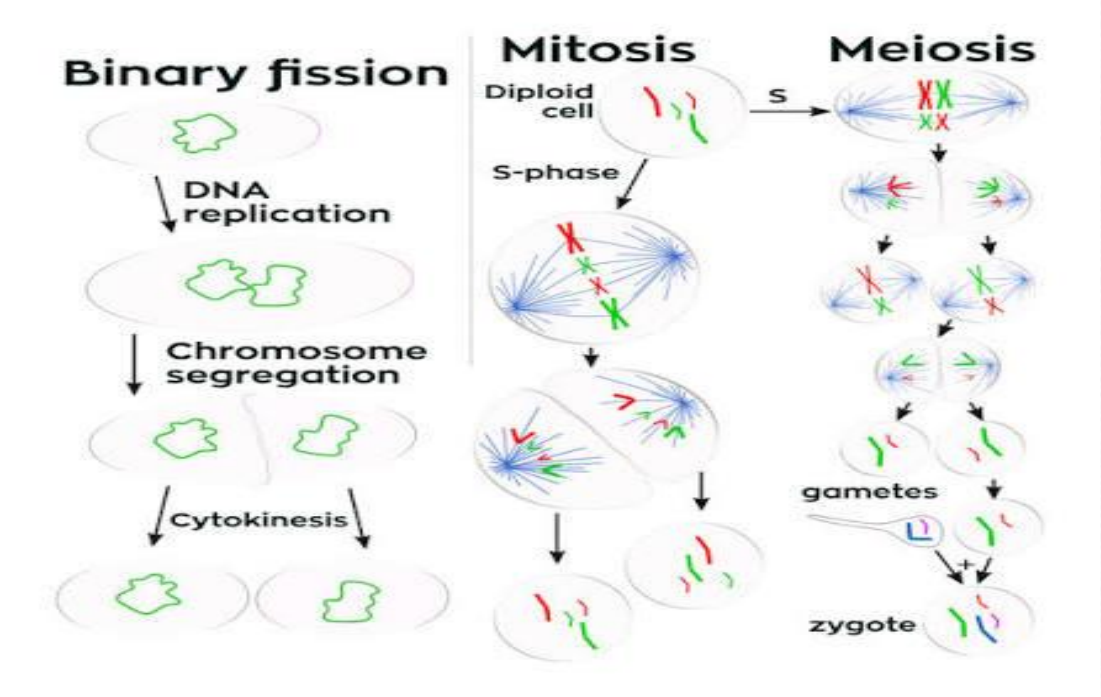
Daughter cells are not identical.

3-Binary Fission

Found in single-celled organisms (e.g., bacteria).

Used for reproduction.

Cell Division



Types of Cells Division

Two main phases:

1-Interphase (active phase, not just resting)

G0 Phase: Cell neither divides nor prepares for division.

G1 Phase: Cell grows and is metabolically active.

2-M Phase (Mitosis phase)

Cell division occurs.

Includes karyokinesis (nuclear division) and cytokinesis (cytoplasmic division).

Mitosis

- Type of cell division in eukaryotic cells.
- Produces two identical daughter cells with the same number and type of chromosomes as the parent cell.
- Important for growth, development, and tissue repair.

Types of Mitosis

1-Interphase

Cell grows and prepares for division.

DNA is replicated.

Normal cell functions continue.

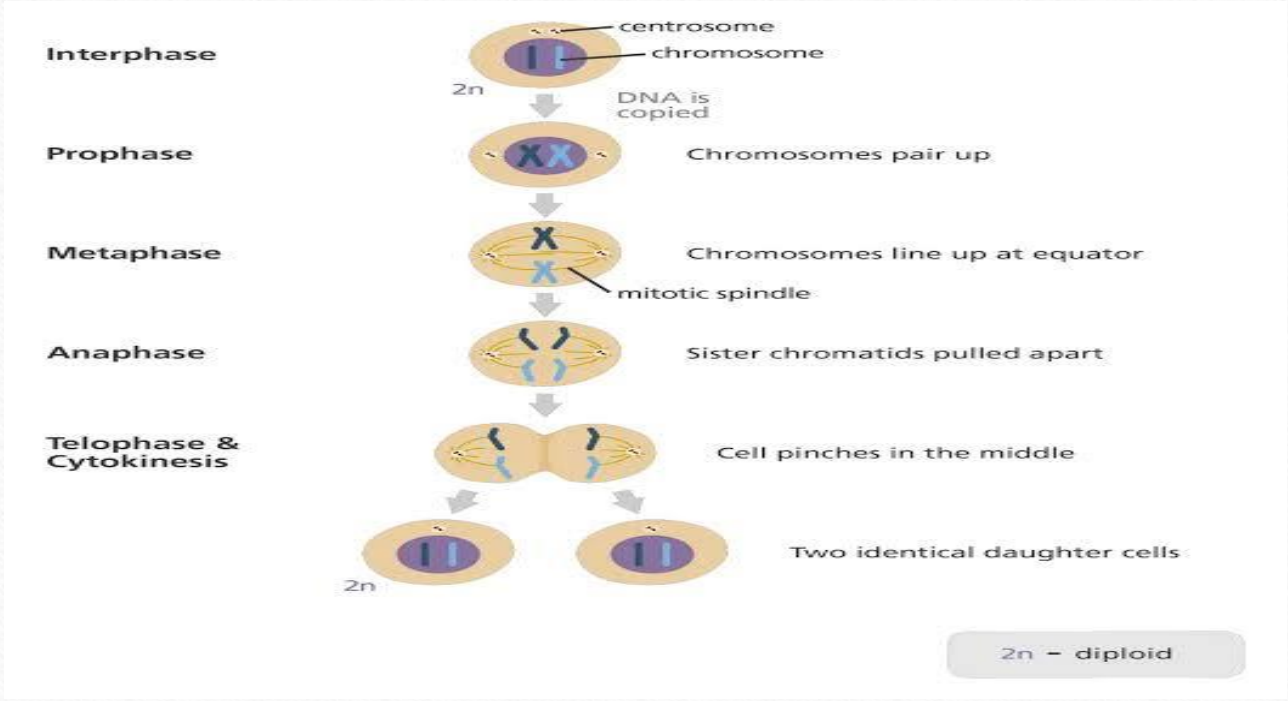
2-Prophase

Chromatin condenses into visible chromosomes (two sister chromatids each).

Nuclear envelope breaks down.

Spindle fibers (microtubules) form.

Mitosis


Interphase
centrosome
chromosome
2n
DNA is copied
Prophase
Chromosomes pair up
Metaphase
Chromosomes line up at equator
mitotic spindle
Anaphase
Sister chromatids pulled apart
Telophase & Cytokinesis
Cell pinches in the middle
2n
Two identical daughter cells
2n – diploid

3-Metaphase

Chromosomes align at the metaphase plate.

Spindle fibers attach to kinetochores of chromosomes.

4-Anaphase

Sister chromatids separate.

Pulled to opposite poles of the cell.

Each daughter cell gets a complete set of chromosomes.

5-Telophase:

Chromosomes decondense into chromatin.

Nuclear envelope reforms around chromosomes at each pole.

Cleavage furrow forms in animal cells, leading to separation.

Cytokinesis:

Division of cytoplasm.

Occurs with telophase.

Produces two daughter cells with complete sets of chromosomes and organelles.

Any Question


thank you