# Biology Chapter 9 Student Notes

Cytokinesis in Animal and Plant Cells

Cytokinesis – is the division of the cytoplasm.

* Accompanies most cells but not all
* As a result, if cytokinesis doesn’t occur, you have a multinucleated cell.
* Cytoplasm division begins in anaphase and continues into telophase
* Cytokinesis is different in plant and animal cells because of differences in cell structure.

Cytokinesis in Animal Cells

* A cleavage furrow 🡪an indentation of the membrane between the two daughter nuclei forms just as anaphase draws to a close.
* The cleavage furrow
  + Deepens when a band of actin filaments called a contractile ring, slowly forms a circular constriction between the two daughter cells.

Cytokinesis in Plant Cells

* The rigid cell wall doesn’t allow cytokinesis by furrowing.
* Instead it involves the building of a new cell wall between the daughter cells
* Forms a cell plate🡪newly formed plasma membrane that expands outward until it reaches the old plasma membrane and fuses with the new membrane.
* The new membrane releases molecules that form a new cell wall.
* Cell wall is strengthened by cellulose

Functions of Mitosis

* Permits growth
* Required during development
* Necessary for fertilized egg
* Occurs after birth as a child becomes an adult
* Repair in juries🡪Allows cuts to heal or a broken bone to mend

Cell Cycle Checkpoints

3 check points controlled by cyclins 🡪internal signaling proteins

Specific cyclins must be present for the cell to move on to the G1 phase, to the S phase and to the G2 phase.

1. G1 checkpoint
   1. Primary checkpoint
   2. Cycle is stopped when DNA is damaged
   3. Stopped by p53 (p🡪protein 53 molecular weight g)
   4. First p53 attempts to repair, rising levels bring apoptosis 🡪programmed cell death
2. G2 checkpoint
   1. Stops cycle if DNA does not replicate or does not finish replicating
   2. Prevents the initiation of the M stage
   3. Also offers DNA repair if damaged
3. M Checkpoint
   1. Stops if chromosomes are not properly attached to spindle or aligned properly

Apoptosis

* Programmed cell death
* Cell loose contract with neighboring cells
* Nucleaus fragments and plasma membrane develop blisters
* Cell fragments are engulfed by WBC or neighboring cells

Apoptosis and Cell Division

* Keep the body stable and homeostasis by regulating the number of cells in the body
* Cell division 🡪increases
* Apoptosis 🡪decreases

\*\*Cell division is occurring now in developing skin cells and RBC.

\*\*Apoptosis is occurring to prevent a tumor from developing and viruses from spreading.