

Vocabulary from 8.1-8.11

Binary fission

- The process in a prokaryotic cell where one cell becomes two cells.

Cell cycle

- The process in a eukaryotic cell where one cell becomes two cells. This process can be divided into interphase (G1, S and G2) and mitotic phase.

Interphase

- This is the longest part of the cell cycle lasting approximately 90% of the time of the cell cycle. It is made up of G1, S and G2 phase. It is the period between mitoses.

G1 phase

- This is called gap phase 1 of the cell cycle. It is a period of cell growth. There is no DNA synthesis during this phase.

S phase

- This is the synthesis phase. It is the time during the cell cycle where DNA is synthesized.

G2 phase

- This is called gap phase 2 of the cell cycle. It is a period of cell growth. There is no DNA synthesis during this phase.

Mitotic phase

- This is the part of the cell cycle that consists of mitotic phase and cytokinesis. This phase makes up only about 10% of the total time of the cell cycle.

Mitosis

- This is the process by which chromosomes divide and are divided between two daughter cells. The purpose of this process is to replace dead or dying cells.

Prophase

- This is the first phase of mitosis. Chromosomes become visible. The nuclear envelope dissolves. Spindle microtubules are visible and move chromosomes within the cell.

Metaphase

- This phase of mitosis occurs after prophase. The chromosomes line up in the middle of the cell.

Anaphase

- This phase of mitosis occurs after metaphase. Sister chromatids separate and move to opposite sides of the cell.

Telophase

- This is the last phase of mitosis. It is roughly the reverse of mitosis. Chromosome fibers of each chromosome uncoil and two nuclear envelopes form.

Cytokinesis

- This is the process whereby the cytoplasm is divided into two parts and distributed to the two new cells.

Cell cycle checkpoints

- These are points in the cell cycle where the cell is checked. If there are problems, the cell will be removed from the cell cycle and repaired, if possible. There are three checkpoints in the cell cycle called G1, G2 and M checkpoints.

G1 checkpoint

- At the G1 checkpoint, the cell is checked to see if it is large enough and that there are no mutations. This checkpoint initiates DNA synthesis. Nondividing cells such as nerve and muscle cells will be arrested at the G1 checkpoint.

G2 checkpoint

- At the G2 checkpoint, the cell is checked to see if it is large enough and that the DNA has been replicated appropriately. This checkpoint initiates mitotic phase.

M checkpoint

- At the M checkpoint, the cell is checked to see if chromosomes are appropriately attached to the mitotic spindle. This checkpoint prompts separation of the sister chromatids.

Chromatin

- The form of chromosomes that contains DNA and proteins. At this point, the chromosomes exist as a diffuse mass of thin fibers. Chromatin exists when the cell is not dividing

Chromosomes

- A structure found in the nucleus of the cell that contains gene. Chromatin is a folded up form of chromatin that exists when the cell is dividing. When chromatids are separated, they are referred to as chromosomes.

Chromatids

- This term refers to the two copies of the chromosome.

Sister chromatids

- This is another way of referring to the two chromatids.

Centromere

- This is the point at which two sister chromatids attach.

46 chromosomes

- This is the number of chromosomes found in humans.

Spindle fibers or spindle microtubules

- These emerge from the centrosome. They attach to the chromosomes and move them around the cell and guides their separation.

Polar microtubules

- These are spindle fibers that go from one side of the cell to the other.

Kinetochores microtubules

- These are spindle fibers that go from the centrosome to the centromere of the chromatid in the middle of the cell.

Astral microtubules

- These are spindle fibers that emanate from the centrosome and stay on one side of the cell.

Centrioles

- They form the centrosome. They play a role in cell division but the exact role is unclear since plant cells lack centrioles.

Centrosome

- This structure is also called the microtubule organizing center (MTOC). It is made up of centrioles in animal cells. Spindle fibers emanate from this structure.

Haploid

- A cell that has one copy of the DNA.

Diploid

- A cell that has two copies of the DNA.

Cleavage furrow

- This is the structure that divides the parent cell into two daughter cells in animal cells.

Cell plate

- This is the structure that divides the parent cell into two daughter cells in plant cells.

Signal transduction

- This is the process by which the binding of a signaling molecule to a receptor stimulates numerous intracellular signaling molecules. The end result is cell division.

Growth factor

- This is a certain factor that will bind to a receptor and initiate a signal transduction mechanism.

Cancer

- In this disease, cells divide without controls. They disregard the cell checkpoints. Cells pass through the checkpoints even if there are problems. They also do not abide by anchorage dependence or density dependent inhibition rules that are followed by normal cells.

Anchorage dependence

- Normal cells need to attach to a surface in order to divide

Density dependent inhibition

- Normal cells stop growing when they reach a certain density

Tumor

- This is an abnormal mass of cells.

Benign

- These are cells that remain at their original site in the body. They have not spread and can be removed by surgery.

Malignant

- These are cells that grow and divide at a high rate. They spread and separate from the tumor and travel throughout the body. These cells are difficult to remove.

Metastasis

- This is the process of malignant tumor cells spreading throughout the body.

Carcinoma

- This is cancer of the skin and linings of the body.

Sarcoma

- This is cancer of the support and muscular tissues. Bone cancer is an example.

Leukemia and lymphomas

- This is cancer of the blood forming tissues including the spleen, bone marrow and lymphnodes.

Radiation

- This is a therapy for cancer that uses high energy radiation. This process disrupts cell division.

Chemotherapy

- This is a therapy for cancer that uses drugs to disrupt cell division.