Cell Cycle Phases

The cell life cycle is the series of events that takes place in order for a cell to undergo replication and division. It begins with G1 stage, in which the cell grows and creates many of the proteins and enzymes it needs later. There is an offshoot of the G1 stage known as the G0 stage, when cells are arrested and do not undergo growth. This is a resting phase where cells have temporarily left the cycle. After the G1 stage, there is a G1 checkpoint where a control mechanism ensures that the cell has the necessary size and machinery to undergo DNA replication. If a cell passes the G1 checkpoint, it enters S stage (synthesis stage) in which DNA replication occurs. After successful DNA synthesis, the cell enters G2 stage where the cell continues to grow in size, duplicating organelles and cytosol. The final checkpoint is the G2 checkpoint, where another control mechanism ensures that the cell has two sets of every component and the size needed for division. Once the check is completed, the cell enters M stage (mitosis) and completes division, finishing the cell life cycle.

PLAY PICMONIC

Characteristics

G0 Phase

Gangster (0)

G0 (Gap 0) phase is an offshoot of G1, an arrested phase where the cell has stopped dividing until it grows or has favorable conditions to re-enter the cell cycle.

Growth Arrest

Growing-Arrested

G0 (Gap 0) stage is an offshoot of G1, an arrested phase where the cell has stopped dividing until it grows or has favorable conditions to re-enter the cell cycle.

G1 Phase

Gangster (1) Wand

G1 (gap-1, or pre-synthetic gap) stage is the first stage of the cell life cycle and the first stage of interphase, which covers G1, S and G2 stages. During G1 the cell increases in size and ensures it has all the machinery ready for DNA replication.

G1 Check By Rb And p53

Gangster (1) Wand with Check-mark and Red-tin blast and p (50) Cent rapper (3) Tree

The G1 check is a checkpoint where the cell must be large enough and have the machinery ready for DNA replication in the S phase. The proteins Rb and p53, among others, control whether the cell is allowed to move into the next phase of the cell cycle or not.

S Phase

Synthesizer

The S phase of the cell cycle is where DNA synthesis occurs.

DNA Mismatch Repair

DNA Strand Mis-Matched being Repaired

During DNA Mismatch Repair damaged DNA can either be repaired or if severe the cell can initiate cell cycle arrest or apoptosis. While mismatch repair occurs throughout the cell cycle this process occurs with the highest levels in the S-phase.

DNA Synthesis

DNA-Strand Synthesized

The S phase of the cell cycle is where DNA synthesis occurs. During G2 (Gap-2) check, the cell ensures that it has the right amount of cytoplasm to divide. It also checks to ensure that its chromosomes are undamaged. Damaged DNA can either be repaired, or if severe the cell can initiate cell cycle arrest or apoptosis.

G2 Phase

Gangster (2) Tutu

During the G2 (gap-2) stage, the cell continues to grow, duplicating organelles and cytosol.

G2 Check

Gangster (2) Tutu with Check

During G2 (Gap-2) check, the cell ensures that it has the right amount of cytoplasm to divide. It also checks to ensure that its chromosomes are undamaged.

M Phase

Mitt-toes

During the M (mitosis) stage, the cell begins to undergo the process of mitosis, which is cell division. After mitosis is finished, there are two equal daughter cells created from the one parent cell.

Mitosis And Cytokinesis

Mitt-toes and Side-toes

During the M (mitosis) stage, the cell begins to undergo the process of mitosis, which is cell division. After mitosis is finished, there are two equal daughter cells created from the one parent cell.