Cell Division Quiz Answer Key PDF

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Why is cytokinesis an important part of cell division, and how does it differ between plant and animal cells?

Cytokinesis is important because it physically divides the cytoplasm and organelles between the two daughter cells, ensuring they can function independently. In animal cells, cytokinesis occurs through the formation of a cleavage furrow, while in plant cells, it involves the creation of a cell plate that develops into a new cell wall.

How does independent assortment during meiosis contribute to genetic diversity?

Independent assortment during meiosis contributes to genetic diversity by ensuring that each gamete receives a random mix of chromosomes from both parents, resulting in unique combinations of alleles.

Explain the role of cyclins and cyclin-dependent kinases (Cdks) in the regulation of the cell cycle.

Cyclins are proteins that bind to and activate cyclin-dependent kinases (Cdks), which are enzymes that phosphorylate target proteins to regulate the cell cycle. The binding of cyclins to Cdks triggers specific cell cycle events, such as progression from G1 to S phase and from G2 to M phase, ensuring that the cell cycle proceeds in a controlled manner.

What is the primary purpose of mitosis?

A. Production of gametes

C. Growth and repair ✓

D. Reduction of chromosome number

C. Genetic variation

Which checkpoint ensures that all chromosomes are attached to the spindle before anaphase?

A. G1 Checkpoint

C. G2 Checkpoint

D. S Checkpoint

C. M Checkpoint ✓

During which phase of mitosis do the sister chromatids separate?

A. Prophase

C. Anaphase ✓

D. Telophase

C. Metaphase

Which processes contribute to genetic variation during meiosis? (Select all that apply)

A. Cross over ✓

C. DNA replication

D. Independent assortment ✓

C. Cytokinesis

Which of the following is NOT a phase of mitosis?

A. Prophase

C. Metaphase

D. Telophase

C. Interphase ✓

What is the term for the exchange of genetic material between homologous chromosomes during meiosis?

A. Independent assortment

C. Segregation

D. Synapsis

C. Cross over ✓

Describe the process and significance of crossing over during meiosis.

Cross over occurs during prophase I of meiosis when homologous chromosomes align closely and exchange segments of genetic material. This exchange results in new combinations of alleles, contributing to genetic variation in the resulting gametes.

Which of the following are outcomes of errors in meiosis? (Select all that apply)

A. Genetic disorders ✓

C. Cancer

D. Aneuploidy ✓

C. Identical offspring

What are the main differences between mitosis and meiosis in terms of their processes and outcomes?

1. Mitosis involves one division and produces two identical diploid cells, while meiosis involves two divisions and produces four genetically diverse haploid cells. 2. Mitosis is used for growth and repair, whereas meiosis is used for sexual reproduction.

Which of the following are phases of the cell cycle? (Select all that apply)

A. G1 Phase ✓

C. S Phase ✓

D. G2 Phase ✓

C. M Phase ✓

Which phase of the cell cycle involves DNA replication?

A. G1 Phase

C. G2 Phase

D. M Phase

C. S Phase ✓

Which structure is responsible for organizing the spindle fibers during cell division?

A. Chromosome

C. Nucleus

D. Ribosome

C. Centrosome ✓

What are the functions of the cell cycle checkpoints? (Select all that apply)

A. To ensure DNA is replicated correctly ✓
C. To initiate cytokinesis
D. To prevent uncontrolled cell division ✓
C. To ensure proper chromosome separation ✓

Which of the following are true about mitosis? (Select all that apply)

A. It results in two identical daughter cells. ✓
C. It involves two rounds of division.
D. It is used for growth and repair. ✓
C. It reduces chromosome number by half.

Discuss how errors in cell division can lead to cancer. Include the role of oncogenes and tumor suppressor genes.

Errors in cell division can lead to cancer by causing mutations in oncogenes, which promote cell division, and tumor suppressor genes, which normally inhibit cell growth. When these genes are mutated, it can result in uncontrolled cell proliferation, leading to tumor formation.

Which structures are involved in chromosome movement during cell division? (Select all that apply)

A. Spindle fibers ✓
C. Ribosomes
D. Centrosomes ✓
C. Lysosomes

What is the result of meiosis?

A. Two diploid cells
C. Two haploid cells
D. Four diploid cells
C. Four haploid cells ✓