

Cell Function Quiz Answer Key PDF

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What is apoptosis, and why is it important for multicellular organisms?

Apoptosis is a form of programmed cell death that is essential for the development and maintenance of healthy tissues in multicellular organisms.

Explain the role of the nucleus in a eukaryotic cell.

The nucleus is responsible for storing the cell's DNA, regulating gene expression, and controlling cellular activities through the synthesis of RNA and proteins.

Which phase of the cell cycle involves DNA replication?

- A. G1 phase
- C. G2 phase
- D. M phase
- C. S phase ✓**

Which structures are involved in protein synthesis? (Select all that apply)

- A. Ribosomes ✓**
- C. Rough Endoplasmic Reticulum ✓**
- D. Lysosomes
- C. Golgi Apparatus

Which of the following are components of the cell membrane? (Select all that apply)

- A. Phospholipids ✓**
- C. Nucleic acids
- D. Carbohydrates ✓**

C. Proteins ✓

Which of the following are types of passive transport? (Select all that apply)

A. Diffusion ✓

C. Active transport

D. Facilitated diffusion ✓**C. Osmosis ✓**

What are the phases of mitosis? (Select all that apply)

A. Prophase ✓**C. Anaphase ✓****D. Telophase ✓****C. Metaphase ✓**

How do enzymes function as catalysts in cellular metabolism?

Enzymes function as catalysts in cellular metabolism by binding to substrates and facilitating chemical reactions without being consumed in the process.

Discuss the differences between mitosis and meiosis in terms of their outcomes and purposes.

1. Mitosis results in two identical diploid daughter cells, while meiosis results in four genetically diverse haploid gametes. 2. Mitosis is primarily for growth and tissue repair, whereas meiosis is for sexual reproduction.

Explain how signal transduction pathways enable cells to respond to external signals.

Signal transduction pathways enable cells to respond to external signals by initiating a cascade of biochemical reactions that lead to changes in gene expression, enzyme activity, or cellular behavior, ultimately allowing the cell to adapt to its environment.

What is the role of lysosomes in the cell?

A. Energy production

C. Protein synthesis

D. DNA replication

C. Digestion of waste materials ✓

What is the primary function of the mitochondria in the cell?

A. Protein synthesis

C. Energy production ✓

D. DNA replication

C. Lipid synthesis

Which process occurs in the chloroplasts of plant cells?

A. Cellular respiration

C. Protein synthesis

D. Glycolysis

C. Photosynthesis ✓

Which organelle is known as the control center of the cell?

A. Nucleus ✓

C. Ribosome

D. Mitochondria

C. Golgi Apparatus

Which of the following are functions of the smooth endoplasmic reticulum? (Select all that apply)

A. Protein synthesis

C. Detoxification ✓

D. DNA replication

C. Lipid synthesis ✓

What is the main structural component of the cell membrane?

A. Proteins

C. Phospholipids ✓

D. Nucleic acids

C. Carbohydrates

Which organelle is responsible for modifying and packaging proteins?

- A. Lysosome
- C. Ribosome
- D. Mitochondria
- C. Golgi Apparatus ✓**

What type of transport requires energy to move substances across the cell membrane?

- A. Passive transport
- C. Osmosis
- D. Diffusion
- C. Active transport ✓**

Describe the process of photosynthesis and its importance to plant cells.

Photosynthesis occurs in plant cells primarily in the chloroplasts, where chlorophyll captures sunlight. The overall equation for photosynthesis can be summarized as: $6\text{CO}_2 + 6\text{H}_2\text{O} + \text{light energy} \rightarrow \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2$. This process is crucial for plants as it enables them to produce their own food and release oxygen, which is essential for life on Earth.

Which processes are part of cellular respiration? (Select all that apply)

- A. Glycolysis ✓**
- C. Photosynthesis
- D. Electron transport chain ✓**
- C. Krebs cycle ✓**