

Cell Organelles Quiz Questions and Answers PDF

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What is the primary function of ribosomes?

- Lipid synthesis
- Protein synthesis ✓**
- DNA replication
- Photosynthesis

Ribosomes are essential cellular structures that synthesize proteins by translating messenger RNA (mRNA) into polypeptide chains. They play a crucial role in the process of gene expression and are found in all living cells.

Explain the role of the cytoskeleton in a cell.

The cytoskeleton is a network of protein filaments and tubules that maintains cell shape, enables cellular movement, organizes organelles, and is essential for processes such as mitosis and cytokinesis.

What are the differences between the rough and smooth endoplasmic reticulum?

The rough endoplasmic reticulum has ribosomes on its surface and is involved in protein synthesis, whereas the smooth endoplasmic reticulum does not have ribosomes and is involved in lipid synthesis and detoxification.

Where is the genetic material of a cell primarily located?

- Golgi Apparatus
- Ribosome
- Nucleus ✓
- Mitochondria

The genetic material of a cell, primarily in the form of DNA, is mainly located in the nucleus of eukaryotic cells. In prokaryotic cells, the genetic material is found in the cytoplasm, as they lack a defined nucleus.

Why is the cell membrane considered selectively permeable, and how does this property benefit the cell?

The cell membrane is considered selectively permeable because it contains phospholipid bilayers and proteins that control the movement of substances in and out of the cell, allowing only specific molecules to pass through while keeping others out.

Which organelle is responsible for photosynthesis in plant cells?

- Chloroplast ✓
- Mitochondria
- Lysosome

Nucleus

The organelle responsible for photosynthesis in plant cells is the chloroplast. Chloroplasts contain chlorophyll, which captures light energy to convert carbon dioxide and water into glucose and oxygen.

Discuss the significance of chloroplasts in plant cells.

Chloroplasts are significant in plant cells because they enable photosynthesis, allowing plants to convert sunlight into energy and produce oxygen.

Which organelles contain their own DNA? (Select all that apply)

- Nucleus
- Mitochondria ✓
- Chloroplasts ✓
- Ribosomes

Organelles that contain their own DNA include mitochondria and chloroplasts. These organelles are unique as they have their own genetic material, separate from the nuclear DNA of the cell.

Which of the following are components of the endomembrane system? (Select all that apply)

- Nucleus
- Endoplasmic Reticulum ✓
- Golgi Apparatus ✓
- Mitochondria

The endomembrane system includes various organelles that work together to modify, package, and transport lipids and proteins. Key components include the endoplasmic reticulum, Golgi apparatus, lysosomes, and vesicles.

Which organelle modifies and packages proteins for secretion?

- Ribosome
- Golgi Apparatus ✓**
- Lysosome
- Smooth ER

The Golgi apparatus is the organelle responsible for modifying, sorting, and packaging proteins for secretion or delivery to other organelles. It plays a crucial role in the post-translational processing of proteins synthesized in the endoplasmic reticulum.

Which organelles are involved in energy production? (Select all that apply)

- Mitochondria ✓**
- Chloroplasts ✓**
- Ribosomes
- Lysosomes

The organelles primarily involved in energy production are mitochondria and chloroplasts. Mitochondria generate ATP through cellular respiration, while chloroplasts convert sunlight into chemical energy via photosynthesis.

Which of the following organelles are involved in protein processing and transport? (Select all that apply)

- Ribosomes ✓**
- Rough ER ✓**
- Golgi Apparatus ✓**
- Smooth ER

The organelles involved in protein processing and transport include the endoplasmic reticulum (ER) and the Golgi apparatus. These structures play crucial roles in synthesizing, modifying, and distributing proteins within the cell.

Which structures are found in plant cells but not in animal cells? (Select all that apply)

- Cell wall ✓**
- Chloroplasts ✓**
- Centrioles
- Large central vacuole ✓**

Plant cells contain structures such as chloroplasts, a cell wall, and large central vacuoles, which are not found in animal cells. These components are essential for photosynthesis, structural support, and storage in plants.

Which organelle is known as the "powerhouse of the cell"?

- Nucleus
- Ribosome
- mitochondria ✓**
- Golgi Apparatus

The mitochondrION is often referred to as the "powerhouse of the cell" because it is responsible for producing adenosine triphosphate (ATP), the energy currency of the cell, through cellular respiration.

Which organelle is involved in detoxifying harmful substances?

- Lysosome
- Peroxisome ✓**
- Golgi Apparatus
- Smooth ER

The smooth endoplasmic reticulum (SER) is the organelle primarily responsible for detoxifying harmful substances in cells. It plays a crucial role in metabolizing drugs and synthesizing lipids, contributing to cellular homeostasis.

How do lysosomes contribute to cellular homeostasis?

Lysosomes contribute to cellular homeostasis by degrading and recycling cellular waste and macromolecules, thus maintaining a balanced internal environment.

Describe the process by which proteins are synthesized and transported out of the cell.

Proteins are synthesized in ribosomes through translation of mRNA, then transported out of the cell via the endoplasmic reticulum and Golgi apparatus.

What structure provides plant cells with rigidity and protection?

- Cell membrane
- Cytoskeleton
- Cell wall ✓**
- Endoplasmic reticulum

The cell wall is a rigid structure that surrounds plant cells, providing them with support and protection against environmental stresses. It is primarily composed of cellulose, which contributes to the overall strength and stability of the plant.

What functions are associated with the Golgi apparatus? (Select all that apply)

- Protein modification ✓**
- Lipid synthesis
- Packaging proteins ✓**
- Photosynthesis

The Golgi apparatus is primarily involved in modifying, sorting, and packaging proteins and lipids for secretion or delivery to other organelles. It plays a crucial role in the post-translational modification of proteins and the formation of lysosomes.

What is the primary function of the smooth endoplasmic reticulum?

- Protein synthesis
- Lipid synthesis ✓**
- DNA replication
- Photosynthesis

The smooth endoplasmic reticulum (SER) is primarily involved in the synthesis of lipids, metabolism of carbohydrates, and detoxification of drugs and poisons. It also plays a role in calcium storage and

| release in muscle cells.