Human Cell Worksheet Answer Key PDF

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Part 1: Building a Foundation

What is the primary function of the cell membrane?

undefined. To produce energy

undefined. To control the movement of substances in and out of the cell ✓

undefined. To synthesize proteins

undefined. To store genetic information

The primary function of the cell membrane is to control the movement of substances in and out of the cell.

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

undefined. Nucleus

undefined. Organelles ✓

undefined. Cytosol ✓

undefined. Cell wall

Components of the cytoplasm include organelles and cytosol.

Explain the role of ribosomes in a cell.

Ribosomes are responsible for synthesizing proteins by translating messenger RNA.

List the two types of Endoplasmic Reticulum and their primary functions.

1. What is the first type of Endoplasmic Reticulum?

Rough Endoplasmic Reticulum

2. What is the primary function of Rough ER?

Synthesize proteins

3. What is the second type of Endoplasmic Reticulum?

Smooth Endoplasmic Reticulum

4. What is the primary function of Smooth ER?

Synthesize lipids

The two types of Endoplasmic Reticulum are Rough ER, which synthesizes proteins, and Smooth ER, which synthesizes lipids.

Where is the nucleolus located?

undefined. In the cytoplasm

undefined. Inside the nucleus ✓

undefined. On the cell membrane

undefined. In the Golgi apparatus

The nucleolus is located inside the nucleus.

Part 2: Understanding and Interpretation

Which organelle is primarily responsible for modifying, sorting, and packaging proteins?

undefined. Ribosome

undefined. Golgi Apparatus ✓

undefined. Lysosome

undefined. mitochondria

The Golgi Apparatus is primarily responsible for modifying, sorting, and packaging proteins.

Which processes occur in the Smooth Endoplasmic Reticulum? (Select all that apply)

undefined. Protein synthesis

undefined. Lipid synthesis ✓

undefined. Detoxification ✓

undefined. DNA replication

Processes that occur in the Smooth Endoplasmic Reticulum include lipid synthesis and detoxification.

Describe how the structure of the cell membrane contributes to its function.

The structure of the cell membrane, composed of a phospholipid bilayer with embedded proteins, allows it to regulate the movement of substances in and out of the cell.

Part 3: Application and Analysis

If a cell is unable to produce ribosomes, which cellular process would be directly affected?

undefined. Lipid synthesis

undefined. Protein synthesis ✓

undefined. DNA replication

undefined. Cell division

If a cell is unable to produce ribosomes, protein synthesis would be directly affected.

A scientist discovers a new cell type that lacks lysosomes. What potential issues might this cell face? (Select all that apply)

undefined. Accumulation of waste ✓

undefined. Inability to synthesize proteins

undefined. Difficulty in digestifying cellular debris ✓

undefined. Problems with energy production

A cell lacking lysosomes might face issues such as accumulation of waste and difficulty in digestifying cellular debris.

How might a malfunction in the Golgi apparatus affect a cell's function? Provide a specific example.

A malfunction in the Golgi apparatus could lead to improper protein modification and sorting, potentially resulting in diseases such as cystic fibrosis.

Which of the following best describes the relationship between the nucleus and ribosomes?

undefined. The nucleus stores proteins made by ribosomes.

undefined. Ribosomes transport genetic material to the nucleus.

undefined. The nucleus directs ribosomes to synthesize proteins. ✓

undefined. Ribosomes provide energy for the nucleus.

The nucleus directs ribosomes to synthesize proteins based on the genetic information it contains.

Analyze the impact of a damaged cytoskeleton on a cell. Which of the following might occur? (Select all that apply)

undefined. Loss of cell shape ✓

undefined. Impaired cell movement ✓

undefined. Increased protein synthesis

undefined. Disrupted organelle positioning ✓

A damaged cytoskeleton might lead to loss of cell shape, impaired cell movement, and disrupted organelle positioning.

Compare and contrast the roles of lysosomes and peroxisomes in a cell.

Lysosomes are involved in breaking down waste materials and cellular debris, while peroxisomes are involved in lipid metabolism and detoxification of harmful substances.

Part 4: Evaluation and Creation

Which scenario would most likely lead to a cell's inability to divide?

undefined. Dysfunctional mitochondria

undefined. Non-functional centrioles ✓

undefined. Excessively lysosome activity

undefined. Overactive ribosomes

A non-functional centriole would most likely lead to a cell's inability to divide.

Evaluate the following scenarios and determine which could lead to cell death. (Select all that apply)

undefined. Complete breakdown of the cell membrane ✓

undefined. Inhibition of protein synthesis ✓

undefined. Overproduction of lipids in the Smooth ER

undefined. Malfunction of the Golgi apparatus

Scenarios that could lead to cell death include complete breakdown of the cell membrane and inhibition of protein synthesis.

Design an experiment to test the effects of a new drug on the function of the endoplasmic reticulum. Outline your hypothesis, method, and expected results.

The experiment should include a hypothesis about the drug's effect on ER function, a method for testing it, and expected results based on the drug's mechanism of action.