What is Cell Structure?

Worksheet

A cell's structure consists of a plasma membrane enclosing cytoplasm, a nucleus (in eukaryotes) that holds DNA, and organelles like mitochondria, ribosomes, and the endoplasmic reticulum that each perform specific jobs to keep the cell alive.

Questions

1. Which structure holds a eukaryotic cell's genetic material?

A) Ribosome
B) Nucleus
C) Golgi apparatus
D) Cytoplasm

2. Which organelle generates most of a cell's ATP?

A) Lysosome
B) Nucleus
C) Mitochondrion
D) Vacuole

3. Which feature is found in plant cells but NOT animal cells?

A) Plasma membrane
B) Cell wall
C) Cytoplasm
D) Ribosomes

4. Where does protein synthesis begin in a cell?

A) Mitochondrion
B) Ribosome
C) Lysosome
D) Cell membrane

5. Which organelle would you expect to be especially abundant in a muscle cell, and why?

6. A cell has a cell wall, chloroplasts, and a large central vacuole. What type of cell is it?

7. Why can't a red blood cell (which has no nucleus) divide by mitosis?

8. Define: What are the three main parts of a eukaryotic cell?

9. Define: What is an organelle?

10. Define: Which organelle is the 'powerhouse of the cell'?

Answer Key

1. B) Nucleus - The nucleus stores DNA and controls gene expression.

2. C) Mitochondrion - Mitochondria carry out cellular respiration to produce ATP.

3. B) Cell wall - Only plant cells have a rigid cellulose cell wall.

4. B) Ribosome - Ribosomes read mRNA and assemble amino acids into proteins.

5. Muscle cells need constant energy for contraction Mitochondria produce ATP through cellular respiration So muscle cells are packed with mitochondria to meet this high energy demand

6. Cell wall + chloroplasts + large vacuole are hallmark plant cell features Animal cells lack all three Therefore this is a plant cell

7. Mitosis requires the DNA stored in the nucleus to be copied and separated Mature red blood cells have ejected their nucleus to make room for hemoglobin Without a nucleus there is no DNA to divide, so the cell cannot undergo mitosis

8. The plasma membrane, the cytoplasm, and the nucleus.

9. A specialized structure inside a cell that performs a specific function, like a tiny organ.

10. The mitochondrion, which produces ATP energy.