

What Are the Cytoplasm and Organelles?

Worksheet

The cytoplasm is the fluid-filled interior of a cell (excluding the nucleus) that suspends organelles like mitochondria, ribosomes, and the endoplasmic reticulum, each carrying out a distinct life-sustaining function.

Questions

1. What fills the space between the nucleus and the cell membrane?
 - A) Chromatin
 - B) Cytoplasm
 - C) Cell wall
 - D) Nucleolus
2. Which organelle folds and modifies newly made proteins?
 - A) Smooth ER
 - B) Rough endoplasmic reticulum
 - C) Lysosome
 - D) Vacuole
3. What is the main role of the Golgi apparatus?
 - A) DNA replication
 - B) Sorting and packaging proteins
 - C) Producing ATP
 - D) Photosynthesis
4. Which organelle breaks down waste using digestive enzymes?
 - A) Mitochondrion
 - B) Lysosome
 - C) Ribosome
 - D) Golgi apparatus
5. A pancreatic cell secretes large amounts of digestive enzymes. Which organelles would you expect to be well developed?
6. A cell's lysosomes rupture and release their enzymes into the cytoplasm. What happens?
7. Why do liver cells, which detoxify chemicals, have unusually abundant smooth ER?
8. Define: What is the cytoplasm?
9. Define: What is the difference between rough and smooth ER?
10. Define: What does the Golgi apparatus do?

Answer Key

1. B) Cytoplasm - The cytoplasm is the fluid and organelle-filled region outside the nucleus.
2. B) Rough endoplasmic reticulum - Ribosomes on the rough ER produce proteins that are then folded inside it.
3. B) Sorting and packaging proteins - The Golgi modifies, sorts, and packages molecules for delivery.
4. B) Lysosome - Lysosomes contain enzymes that digest waste and damaged organelles.
5. Secreting proteins requires synthesis, folding, and packaging The rough ER (synthesis/folding) and Golgi apparatus (packaging) handle these steps So a secretory cell like this has an extensive rough ER and Golgi apparatus
6. Lysosomes contain digestive enzymes meant to break down waste inside a membrane-bound compartment If they rupture, those enzymes spill into the cytoplasm The enzymes begin digesting the cell's own organelles and structures, which can kill the cell
7. The smooth endoplasmic reticulum contains enzymes that break down toxins and drugs Liver cells have a high detoxification workload So they evolve extra smooth ER to keep up with that demand
8. The gel-like fluid filling a cell (outside the nucleus) that holds and supports the organelles.
9. Rough ER is studded with ribosomes and folds proteins; smooth ER lacks ribosomes and makes lipids/detoxifies.
10. It modifies, sorts, and packages proteins and lipids for transport or secretion.

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