

Name: _____ Date: _____

What Makes a Cell Tick? Pulsing Organelles 10th Grade Quiz

Signal transduction, energetic coupling, and membrane selectivity — reinforcing how microscopic machinery governs macroscopic biological systems.

1. In a specialized pancreatic cell, newly synthesized insulin must be tagged with a carbohydrate sequence to ensure it is routed for extracellular secretion. Which organelle is primarily responsible for this modification and sorting process?

- A. Smooth Endoplasmic Reticulum
- B. Golgi Apparatus
- C. Lysosome
- D. Ribosome

2. The intense metabolic demands of a hummingbirds' flight muscles require a significantly higher density of _____ per cell compared to the skin cells of the same organism.

- A. Chloroplasts
- B. Vacuoles
- C. Mitochondria
- D. Centrioles

3. The fluid mosaic model describes the cell membrane as a static, rigid border that provides structural support similar to a cell wall.

- A. True
- B. False

4. If a pharmaceutical drug is designed to inhibit the formation of the spindle apparatus during mitosis, which cellular component is the drug directly targeting?

- A. The Nucleolus
- B. The Cytoskeleton (Microtubules)
- C. The Rough ER
- D. The Plasma Membrane

5. Apoptosis, or programmed cell death, involves the controlled release of enzymes from lysosomes to digest the cell from the inside out.

- A. True
- B. False

6. In the liver, high concentrations of _____ are necessary for the detoxification of lipid-soluble drugs and the synthesis of steroid hormones.

- A. Smooth Endoplasmic Reticulum
- B. Rough Endoplasmic Reticulum

Name: _____ Date: _____

- C. Nuclei
- D. Lysosomes

7. Cystic Fibrosis is caused by a defect in a chloride ion channel protein. This breakdown in the cell's ability to regulate conductivity and ion flow occurs at which structural level?

- A. Mitochondrial Matrix
- B. Nuclear Envelope
- C. Plasma Membrane
- D. Cytoplasm

8. The theory of endosymbiosis suggests that mitochondria and chloroplasts were once free-living prokaryotes because they possess their own _____.

- A. Endoplasmic Reticulum
- B. Golgi bodies
- C. Vesicles
- D. Circular DNA

9. Ribosomes are found only attached to the Rough Endoplasmic Reticulum and cannot function while floating freely in the cytoplasm.

- A. True
- B. False

10. A cell in the lining of the small intestine actively moves glucose against its concentration gradient. Which two components are most critical for this 'metabolic absorption'?

- A. Membrane proteins and ATP
- B. Phospholipids and Lysosomes
- C. DNA and the Nucleolus
- D. Cell wall and Vacuole