Name: _____ **Date:** _____

Sizzling Systems: Sixth Grade Cell Structure Synthesis Quiz

Examine complex cellular systems through scenario analysis, moving beyond identification to evaluate organelle interactions and metabolic failures.

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1. A scientist observes a specialized cell in a deep-sea organism that must survive in extreme darkness. The cell has an unusually high concentration of mitochondria. Which biological function is this adaptation likely supporting?

A. Enhanced conductivity for nervous signals
B. Increased respiration to fuel active transport in low-nutrient zones
C. Rapid reproduction to replace damaged tissues
D. Structural movement within the cell's cytoskeleton

2. In a hypothetical 'Cell City' scenario, the Post Office (Golgi Apparatus) stops functioning. What immediate impact would this have on the rest of the 'city'?

A. DNA instructions would be lost and unable to reach ribosomes
B. The cell would run out of energy and stop moving
C. Proteins would be created but fail to reach their final destination or be secreted
D. The cell membrane would dissolve without lipid support

3. If a cell is engaging in 'Conductivity' to send a signal, it relies on the _____ to regulate the passage of ions like sodium and potassium.

A. Cell Membrane
B. Endoplasmic Reticulum
C. Lysosome
D. Ribosome

4. True or False: Smooth Endoplasmic Reticulum is primarily responsible for the synthesis of digestive enzymes used by lysosomes for excretion.

A. True
B. False

5. An immune system cell, specifically a macrophage, must engulf and break down invading bacteria. Which organelle works in tandem with the cell membrane to complete this act of excretion and protection?

A. Mitochondria
B. Nucleus
C. Lysosomes
D. Chloroplasts

Name: _____ Date: _____

6. A scientist treats a cell with a chemical that prevents DNA from being transcribed. This chemical is targeting the _____, effectively halting the plan for cell reproduction.

A. Cytoplasm
B. Nucleus
C. Golgi Body
D. Vacuole

7. True or False: Metabolic absorption is a function that occurs exclusively at the cell membrane level without requiring any energy input from the mitochondria.

A. True
B. False

8. Consider a plant cell that needs to secrete a sticky sap to trap insects. Trace the path of the sap's protein components from creation to exit.

A. Nucleus -> Lysosome -> Cell Membrane
B. Ribosome -> Rough ER -> Golgi Apparatus -> Cell Membrane
C. Mitochondria -> Vacuole -> Golgi Apparatus
D. Smooth ER -> Ribosome -> Nucleus

9. During the process of cellular movement, such as the contraction of a muscle cell, the organelle providing the necessary chemical energy is the _____.

A. Mitochondrion
B. Chloroplast
C. Smooth ER
D. Nucleolus

10. True or False: If the ribosomes in a cell were destroyed, the cell would still be able to perform secretion because the Golgi apparatus is the organelle that actually releases the substances.

A. True
B. False