Name: _____ **Date:** _____

The Invisible Architect: 9th Grade Cell Management Quiz

Calculate the downstream impacts of organelle failure and evaluate how specialized cellular structures maintain homeostasis in extreme physiological conditions.

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1. A patient is diagnosed with a rare disorder where their phagocytic white blood cells can engulf bacteria but cannot digest them. Which organelle is most likely dysfunctional?

A. Peroxisomes
B. Lysosomes
C. Golgi Apparatus
D. Smooth Endoplasmic Reticulum

2. In a hypermetabolic state, such as during intense thermogenesis, a cell would require a significant proliferation of _____ to meet ATP demands.

A. Chloroplasts
B. Mitochondria
C. Ribosomes
D. Nucleoli

3. The Fluid Mosaic Model suggests that the cell membrane is a static barrier where proteins are locked in fixed positions to maintain structural integrity.

A. True
B. False

4. If a plant cell were treated with a drug that inhibited the function of the Golgi Apparatus, what would be the most immediate consequence regarding the cell wall?

A. The cell would lose turgor pressure immediately.
B. DNA replication would cease in the S-phase.
C. Complex polysaccharides would not be transported to the cell surface.
D. The cell would be unable to absorb carbon dioxide.

5. The _____ is an extensive network responsible for the synthesis of lipids and the detoxification of metabolic byproducts in liver cells.

A. Rough ER
B. Smooth ER
C. Cytoskeleton
D. Vacuole

6. Nuclear pores are highly regulated gateways that allow mRNA to exit the nucleus while preventing genomic DNA from leaving.

A. True

B. False

7. Which of the following scenarios best illustrates the 'conductivity' function of a cell at the structural level?

A. A root hair cell increasing surface area for water osmosis.
B. A pancreatic cell releasing insulin through exocytosis.
C. A neuron using ion channels to propagate an action potential.
D. A muscle cell utilizing myosin filaments to shorten.

8. According to the endosymbiotic theory, the presence of independent circular DNA makes the _____ unique compared to other organelles like the ER.

A. Mitochondria
B. Lysosomes
C. Ribosomes
D. Centrioles

9. In a high-rigor environment, a researcher observes a cell with an unusually high density of Rough Endoplasmic Reticulum and Golgi bodies. This cell is likely specialized for:

A. Energy storage
B. Protein secretion
C. Acellular replication
D. Passive diffusion

10. The cytoskeleton is a permanent, rigid scaffold that determines a cell's shape at the moment of birth and remained unchanged until cell death.

A. True
B. False