Name: _____ **Date:** _____

Invisible Factories: 8th Grade Cell Architecture Quiz

Signal transduction, protein folding, and energy conversion — harness the power of diagnostic scenarios to analyze how organelle malfunctions disrupt complex biological homeostasis.

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

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

2. The _____ is a network of membranes responsible for synthesizing phospholipids and detoxifying organic compounds in liver cells.

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

3. True or False: The endosymbiotic theory suggests that mitochondria were once independent prokaryotes because they possess their own DNA and double membranes.

A. True
B. False

4. If a cell's Golgi apparatus were destroyed, which of the following immediate consequences would be most critical for a multicellular organism?

A. Inability to replicate DNA
B. Failure to produce ATP
C. Failure to export signaling proteins
D. Immediate rupture of the cell wall

5. In the fluid mosaic model, _____ molecules act as 'ID tags' on the cell membrane, allowing the immune system to recognize self versus non-self cells.

A. Cholesterol
B. Carbohydrate chains
C. Phospholipid heads
D. Transport proteins

6. Which transition represents a high-energy demand scenario where you would expect to see an increase in mitochondrial density within a specific tissue?

A. Adipose tissue during hibernation

B. Dermal cells during sunlight exposure
C. Cardiac muscle during chronic aerobic exercise
D. Bone cells during childhood growth

7. True or False: Plant cells lack a cytoskeleton because the rigid cellulose cell wall provides all necessary structural support.

A. True
B. False

8. The _____ is a dense region within the nucleus where the components of ribosomes are synthesized and assembled.

A. Nuclear envelope
B. Chromatin
C. Nucleolus
D. Cytosol

9. If a cell's membrane loses its 'selectively permeable' nature, what is the most likely result regarding homeostasis?

A. The cell will increase its rate of reproduction
B. Toxins will diffuse in and vital ions will leak out
C. The cell will convert to an anaerobic state
D. Organelles will duplicate to compensate for the loss

10. True or False: Rough Endoplasmic Reticulum is 'rough' because it is studded with lysosomes that help with protein modification.

A. True
B. False