

Name: _____ Date: _____

Nail Cell Structure Concepts for College Biology

Examine sub-cellular organization and membrane dynamics beyond general definitions. This quiz focuses on the specific metabolic roles of specialized organelles and the cytoskeleton.

1. Which organelle is characterized by a double membrane and is responsible for the final stages of aerobic cellular respiration in eukaryotic cells?

- A. Chloroplast
- B. Mitochondrion
- C. Peroxisome
- D. Smooth Endoplasmic Reticulum

2. The Fluid Mosaic Model describes the cell membrane as a static, rigid layer of proteins that prevents the movement of lipids.

- A. True
- B. False

3. In secretory cells, like those in the pancreas, the ____ is highly developed to modify, sort, and package proteins into vesicles.

- A. Golgi apparatus
- B. Lysosome
- C. Nucleolus
- D. Cytoskeleton

4. What is the primary function of the rough endoplasmic reticulum (RER) in specialized executive cells?

- A. Detoxification of metabolic waste
- B. Synthesis of membrane-bound and secreted proteins
- C. Storage of calcium ions for muscle contraction
- D. Hydrolysis of dietary macromolecules

5. Lysosomes originate from the Golgi apparatus and contain hydrolytic enzymes that function best at an acidic pH.

- A. True
- B. False

6. The ____ is an organelle that lacks ribosomes and is primarily involved in lipid synthesis and the detoxification of drugs and poisons.

- A. Rough ER
- B. Smooth ER
- C. Mitochondrion
- D. Vacuole

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7. Which component of the cytoskeleton is responsible for providing high tensile strength and anchoring organelles like the nucleus in place?

- A. Microtubules
- B. Microfilaments
- C. Intermediate filaments
- D. Myosin filaments

8. Cilia and flagella both share a common '9+2' arrangement of microtubules in eukaryotic cells.

- A. True
- B. False

9. The dense region within the nucleus where ribosomal RNA (rRNA) is synthesized and assembled with proteins is called the ____.

- A. Nuclear envelope
- B. Chromatin
- C. Nucleolus
- D. Centrosome

10. Which of the following is a primary role of peroxisomes in eukaryotic metabolism?

- A. Synthesis of glucose via photosynthesis
- B. Production of ATP via the Krebs cycle
- C. Breaking down long-chain fatty acids and detoxifying alcohol
- D. Regulating water balance in plant cells