The Plasma Membrane and Fluid Mosaic Model

Biology · Answer Key · 20 Questions

1. What is the primary function of the plasma membrane?

A) To produce energy for the cell
B) To define the borders of the cell
C) To synthesize proteins
D) To store genetic information

2. What does 'selectively permeable' mean regarding the plasma membrane?

A) It allows all molecules to pass freely
B) It prevents all substances from entering
C) It allows some materials to pass while restricting others
D) It is made only of protein

3. Which component forms the main fabric of the plasma membrane?

A) Cholesterol
B) Carbohydrates
C) Phospholipids
D) Nucleic acids

4. What is the term for the model that describes the plasma membrane as a mosaic of various components?

A) The Sandwich Model
B) The Fluid Mosaic Model
C) The Lipid Bilayer Theory
D) The Protein-Bridge Model

5. Where are carbohydrate chains typically located on the plasma membrane?

A) On the interior surface only
B) Embedded inside the hydrophobic core
C) On the exterior surface
D) Floating in the cytoplasm

6. What is the function of the glycocalyx?

A) To store energy
B) To aid in cell identification and water attraction
C) To provide structural rigidity like a cell wall
D) To transport ions across the membrane

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7. What is the role of cholesterol in the plasma membrane?

A) It acts as a receptor for hormones
B) It helps maintain membrane fluidity across different temperatures
C) It forms the main structural boundary
D) It speeds up chemical reactions

8. What happens to saturated fatty acid tails at low temperatures?

A) They bend and create space
B) They become rigid and dense
C) They disappear
D) They become hydrophilic

9. What is the main difference between peripheral and integral proteins?

A) Peripheral proteins are embedded in the bilayer
B) Integral proteins are only on the surface
C) Integral proteins are embedded in or span the membrane
D) Peripheral proteins have no function

10. What do cells use to recognize each other?

A) Surface markers like glycoproteins
B) Internal organelles
C) Nuclear pores
D) Cytoskeletal fibers

11. Why is the plasma membrane considered 'fluid'?

A) It is made of water
B) Its components can move somewhat with respect to one another
C) It evaporates easily
D) It is constantly being replaced

12. What is the effect of unsaturated fatty acids on membrane fluidity?

A) They make the membrane freeze
B) They increase rigidity
C) They maintain fluidity by creating space with 'kinks'
D) They have no effect

13. What are receptors on the plasma membrane primarily responsible for?

A) Structural support only
B) Transmitting signals and activating intracellular processes
C) Digesting waste
D) Synthesizing lipids

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14. What percentage of a typical human cell's membrane composition is protein?

A) 10 percent
B) 40 percent
C) 50 percent
D) 90 percent

15. What is a characteristic of transmembrane proteins?

A) They are only found on the inner surface
B) They span both layers of the membrane
C) They are made of carbohydrates
D) They are not attached to the membrane

16. Which structure do phospholipids spontaneously form in an aqueous solution?

A) A crystal lattice
B) A solid block
C) A micelle or bilayer
D) A protein chain

17. What is the function of the hydrophobic tails of phospholipids?

A) To attract water
B) To face the extracellular fluid
C) To face each other inside the bilayer
D) To bind to carbohydrates

18. What does the term 'amphiphilic' mean?

A) Having both hydrophilic and hydrophobic parts
B) Being made of only one type of molecule
C) Being unable to dissolve in water
D) Having no charge

19. How do red blood cells utilize membrane flexibility?

A) To divide rapidly
B) To change shape to pass through narrow capillaries
C) To store oxygen
D) To communicate with other cells

20. What is the result of a mutation in the genes encoding receptors?

A) Enhanced immune response
B) Malfunction in signal transduction
C) Increased cell rigidity
D) Greater membrane fluidity

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