Membrane Science: Classification, Synthesis, and Characterization

Biochemistry · Answer Key · 15 Questions

1. What is the pore size range for Microfiltration (MF)?

A) 0.01-0.1 um
B) 0.1-10 um
C) 0.001-0.01 um
D) <0.001 um

2. Which membrane type is specifically used for water desalination?

A) Microfiltration
B) Ultrafiltration
C) Reverse Osmosis
D) Nanofiltration

3. What structural feature characterizes Anisotropic (asymmetric) membranes?

A) Uniform structure throughout
B) Thin dense top layer with porous support
C) Solid non-porous structure
D) Hair-like tubes

4. Which material is an example of an inorganic membrane?

A) Polysulfone
B) Ceramics
C) Cellulose acetate
D) Polyacrylonitrile

5. What is the function of flippases, floppases, and scramblases?

A) Synthesize cholesterol
B) Degrade phospholipids
C) Redistribute phospholipids between leaflets
D) Transport proteins to the Golgi

6. Which organelle is enclosed by a double-membrane nuclear envelope?

A) Lysosome
B) Peroxisome
C) Nucleus
D) Endoplasmic Reticulum

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7. What is the primary role of cholesterol in biological membranes?

A) Energy storage
B) Regulating membrane fluidity
C) DNA replication
D) Protein synthesis

8. Which enzyme is used as a marker for the plasma membrane during Western blot analysis?

A) BiP
B) GAPDH
C) Na/K+-ATPase
D) Calnexin

9. What is the main purpose of the homogenization stage in membrane isolation?

A) Increase temperature
B) Rupture the plasma membrane
C) Synthesize lipids
D) Filter salts

10. What does the zeta potential measure in membrane characterization?

A) Buoyant density
B) Surface charge density
C) Transition temperature
D) Protein-to-lipid ratio

11. Which membrane type allows both solvents and solutes to pass freely?

A) Impermeable
B) Semipermeable
C) Permeable
D) Selectively permeable

12. What is the primary site of membrane lipid synthesis?

A) Nucleus
B) Rough ER
C) Smooth Endoplasmic Reticulum
D) Lysosomes

13. What technique is used to visualize membrane microdomains (lipid rafts)?

A) Atomic Force Microscopy
B) Western Blot
C) Differential centrifugation
D) DSC

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14. Which structural configuration is designed for high-fouling and high-viscosity liquids?

A) Hollow fiber
B) Spiral-wound
C) Plate-and-frame
D) Tubular

15. What is the transition temperature (Tm) measured by DSC?

A) Melting of proteins
B) Transition from rigid gel to fluid state
C) Rate of lipid synthesis
D) Buoyant density of organelles

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