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MATCHING

Use the terms in the following list to identify the cellular location for the steps involved in the synthesis and packaging of a secreted protein.

A. Nucleolus
B. Nucleus
C. Agranular endoplasmic reticulum
D. Granular endoplasmic reticulum
E. Golgi apparatus
F. Endosomes
G. Peroxisomes
H. Lysosomes
I. Cytosol

1. Initiation of translation
2. Protein sorting and packaging
3. Gene transcription

1. ANS: I PTS: 1
2. ANS: E PTS: 1
3. ANS: B PTS: 1

MULTIPLE CHOICE

1. Which of the following is true for both pinocytosis and phagocytosis?
   A. Involves recruitment of actin filaments
   B. Occurs spontaneously and nonselectively
   C. Permits uptake of bacterium into cytosol
   D. Is only observed in macrophages and neutrophils
   E. Does not require adenosine triphosphate

   ANS: A PTS: 1

2. The cell membrane is **least** permeable to which of the following substances?
   A. Sodium
   B. Oxygen
   C. Ethanol
   D. Carbon dioxide
   E. Water

   ANS: A PTS: 1

3. Which of the following best describes the glycocalyx of a cell?
   A. Negatively charged carbohydrate chains that protrude into cytosol
   B. Negatively charged carbohydrate layer on cell surface
   C. Layer of anions aligned on the cytosolic surface of plasma membrane

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D. Large glycogen stores found in “fast” muscles
E. A mechanism of cell-cell attachment

ANS: B PTS: 1

4. Proteins are sorted for their delivery to lysosomes, secretory vesicles, and the plasma membrane in which of the following?
A. Golgi apparatus
B. Smooth endoplasmic reticulum
C. Nucleus
D. Endocytotic vesicle

ANS: A PTS: 1

5. Ubiquinone, an electron acceptor in the electron transport chain (oxidative phosphorylation), is found in which of the following?
A. Inner mitochondrial membrane
B. Mitochondrial matrix
C. Outer mitochondrial membrane
D. Nucleus

ANS: A PTS: 1

6. The citric acid cycle (Krebs cycle) takes place in which of the following?
A. Mitochondrial matrix
B. Inner mitochondrial membrane
C. Outer mitochondrial membrane
D. Inner mitochondrial space

ANS: A PTS: 1

7. All the following processes depend on adenosine triphosphate **except** which of the following?
A. Ciliary movement
B. Positive chemotaxis
C. Movement of oxygen across lipid bilayer
D. Endocytosis
E. Smooth muscle contraction

ANS: C PTS: 1

8. This cytoskeletal element plays a role in certain forms of cell movement and is an essential component of the mitotic spindle _____.
A. Phospholipids
B. Glycocalyx
C. F-actin
D. Microtubules
E. Clathrin

ANS: D PTS: 1

9. Lipid synthesis occurs in which of the following locations?
A. Trans-Golgi network
B. Granular, or “rough,” endoplasmic reticulum

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C. Agranular, or “smooth,” endoplasmic reticulum
D. Nucleus
E. Lysosome

ANS: C PTS: 1

10. The abnormal cleavage of mannose residues during the posttranslational processing of glycoproteins has been shown to result in the development of a lupus-like autoimmune disease in mice. The abnormal cleavage is due to a mutation of the enzyme α-mannosidase II. Based on your understanding of the processing of membrane proteins, you would predict this enzyme to be localized to which of the following?
A. Nucleus
B. Cytosol
C. Golgi apparatus
D. Lysosomes
E. Peroxisomes

ANS: C PTS: 1

11. The observation that abnormal cleavage of mannose residues from glycoproteins causes an autoimmune disease in mice is **most** consistent with the role of which of the following structures in the normal immune response?
A. Cytoskeleton
B. Glycocalyx
C. Peroxisomes
D. Lysosomes
E. Microtubules

ANS: B PTS: 1

12. A pure phospholipid bilayer is most permeable to which of the following?
A. Sodium
B. Calcium
C. Chloride
D. Water
E. Oxygen

ANS: E PTS: 1

13. Which of the following substances in most likely to represent the highest percent of cell mass in a typical cell of the body?
A. Carbohydrates
B. Ions
C. Lipids
D. Proteins
E. Water

ANS: E PTS: 1

14. Cholesterol in the cell membrane most likely serves which of the following functions?
A. Increases membrane permeability
B. Increases membrane turnover

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C. Decreases membrane fluidity
D. Decreases membrane stability

ANS: C PTS: 1

15. Protein molecules are most likely to be actively folded and cross-linked in which of the following structures?
A. Granular endoplasmic reticulum
B. Lysosome
C. Ribosome
D. Golgi apparatus
E. Secretory granule

ANS: A PTS: 1

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