
Part I. Multiple Choice 1.5 pts each (30pts)

1. The ____ face of the Golgi is closest to the ER.
 - a. Cis
 - b. Trans
2. A newly synthesized protein destined to reach the plasma membrane has N-terminal ER signal sequence and no START or STOP TRANSFER sequences. Which of the following must be true about this protein (circle all that apply)?
 - a. It will be a membrane receptor.
 - b. it will be soluble and secreted out of the cell once it reaches the plasma membrane
 - c. it will be a single pass transmembrane protein.
 - d. It will be found in the lumen of a transport vesicle at some point.
3. A cell with a dysfunctional TOM complex would most likely accumulate _____ in the _____.
 - a. Misfolded proteins ; ER
 - b. Mitochondrial proteins ; cytosol
 - c. ER resident proteins ; cytosol
 - d. Misfolded proteins ; nucleus
4. The actions of Rho-GTP would likely form what structures in a cell?
 - a. Lamellopodia
 - b. Stress fibers
 - c. Filopodia
 - d. Membrane ruffles
5. Which of the following is a possible destination of a receptor after it has undergone endocytosis?
 - a. Recycling to the cell surface
 - b. Degradation in lysosomes
 - c. Transcytosis
 - d. All of the above
 - e. None of the above
6. You have identified a lipase that is optimally active at pH 5. Which of the following would you predict to be true about it?
 - a. It is a Golgi resident protein
 - b. It is synthesized in the cytosol and then translocated into the mitochondria
 - c. It contains a KDEL sequence
 - d. None of the above

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7. Vesicles that leave the trans Golgi destined for early endosomes would have which kind of coat protein?
- COPI
 - COPII
 - clathrin
 - retromer
8. Which of the following is an important component of muscle contraction?
- Myosin
 - Actin microfilaments
 - Troponin
 - All of the above
9. Circle all of the organelles in the list below that are topologically equivalent to the extracellular space.
- ER
 - Golgi
 - Nucleus
 - Mitochondria
 - Lysosomes
10. Which of the following ligands would you expect to bind to a member of the nuclear receptor subfamily?
- Acetylcholine
 - LDL
 - Transferrin
 - Cortisol
11. Which of the following second messengers will lead to activation of protein kinase A (PKA)?
- IP3
 - cyclic AMP
 - diacylglycerol
12. Which of the following protein modification events does NOT occur in the Golgi?
- Addition of carbohydrate to serine residues
 - Pruning of N-linked carbohydrates
 - Addition of mannose-6-phosphate tags
 - Trimming by proteolytic enzymes
 - None of the above (i.e. all can occur in the Golgi)
13. ATP is involved in mediating which of the following cytoskeletal processes (choose all that apply)?
- Microtubule polymerization
 - Dynamic instability
 - Treadmilling
 - Muscle contraction

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14. A toxin that inhibits GTP-binding to proteins is also found to accumulate transport vesicles in the cytosol. What specific GTP-binding protein (GTPase) is the toxin likely to be inhibiting?
- Rab
 - Ran
 - Rho
 - Ras
15. Cells use pinocytosis to
- Engulf large particles
 - Degrade damaged organelles
 - Secrete signaling molecules in a regulated fashion
 - Take up fluid from the extracellular environment
16. According to the *Cell Biology of Taste* article, the umami taste is elicited by what types of substances?
- Sugars
 - Organic toxins
 - Amino acids
 - Na⁺ ions
17. '_____ ' describes the process in which the ends of _____ undergo rapid shrinkage.
- Rescue ; microtubules
 - Treadmilling ; actin microfilaments
 - Catastrophe ; microtubules
 - None of the above.
18. Extracellular signals that result in changes to the expression of a gene would likely cause a _____ response.
- Rapid
 - Slow
19. A protein bearing a mannose-6-phosphate (M6P) tag will ultimately end up:
- Retained in the ER
 - In lysosomes
 - Getting secreted out of the cell
 - None of the above.
20. Which of the following accurately describes what is happening at the *plus end* of a microtubule that is undergoing rapid growth?
- The rate of GTP hydrolysis is exceeding the rate of subunit polymerization
 - There are more GDP-bound subunits than GTP-bound subunits
 - the rate of subunit polymerization is exceeding the rate of GTP hydrolysis
 - None of the above.