

## Chapter 5

### Cell Biology

- In paracrine signaling, the signaling molecules affects
  - target cells close to the cell (local action).
  - Muscle contraction.
  - Endocrine factors.
  - Juxtacrine interactions.
- Which of the following are one of the ways that RNAi is being used in genetic and medical research?
  - To study gene function and expression
  - To develop new treatments for genetic diseases like cancer
  - To understand the genetic mutations that cause diseases such as cancer
  - To return sensation to victims of paralysis
- Functions of phosphorylation
  - Introduces a charged and hydrophilic group in the side chain of amino acids
  - Changing a protein's structure
  - Can turn a hydrophobic portion of a protein into a polar and extremely hydrophilic portion of a molecule
  - Addition of phosphate ( $\text{PO}_4^{3-}$ ) to polar group of amino acids
- Which of the following are ATP dependent transporter of lipid?
  - V-type ATPase
  - Scramblase
  - Flippase
  - Floppases
- The process of recombination in prokaryotes takes place in this way
  - Translation
  - Transformation
  - Conjugation
  - Transduction
- Which of the following signal molecule are used for extracellular signaling?
  - Autocrine
  - Endocrine
  - Paracrine
  - Cyclic AMP
- Mark the signal molecules which interact with cell surface receptor.
  - Insulin
  - Glucagon
  - Testosterone
  - Gastrin
- To which of the following residues of the protein, the protein kinases add phosphate groups?
  - Serine
  - Cytosine
  - Threonine
  - Tyrosine
- Which of the following are type of signaling molecule?

- (A) Testosterone  
(C) Thyroxin
- (B) Insulin  
(D) Adenylate cyclase
10. Small charged molecules, often biogenic amines function as  
(A) enzyme.  
(C) neurotransmitters.
- (B) hormones.  
(D) catalyst.
11. What is (are) the difference(s) between microtubules and microfilaments?  
(A) Microtubules are made up of tubulin and microfilaments are made up of intermediate filaments  
(B) Microtubules are important for compression resistance and microfilaments bear tension  
(C) Microtubules are important for the functions of cilia and flagella and the microfilaments are important for cytoplasmic streaming  
(D) Microtubules – muscle contraction; microfilaments – ciliary movement
12. Apoptosis is a controlled process of cell death. The process involves  
(A) exposure of phosphatidyl serine on the outer surface of the cell membrane.  
(B) decreased permeability of the outer mitochondrial membrane.  
(C) increased lysosomal activity.  
(D) inter-nucleosomal cleavage of genomic DNA.
13. Which of the following statements is/are CORRECT for G protein–coupled receptor (GPCR) mediated signaling?  
(A) GPCRs contain seven membrane spanning regions.  
(B) GPCRs are linked to heterotrimeric G protein consisting of  $\alpha$ ,  $\beta$  and  $\gamma$  subunits.  
(C) In the absence of GPCR interacting ligand,  $\alpha$  subunit of G protein is bound to GTP and complexed with  $\beta\gamma$  subunits.  
(D) In the presence of GPCR interacting ligand, GTP is displaced from  $\alpha$  subunit of G protein by GDP, GDP bound  $\alpha$  subunit dissociates from  $\beta\gamma$  dimer and activates the effector.
14. Which of the following gas(es) function(s) as signaling molecule(s) in the human nervous system?  
(A) Nitric oxide  
(C) Helium
- (B) Carbon monoxide  
(D) Argon
15. The intracellular messengers formed by the activation of phosphoinositide cascade are  
(A) phosphatidylinositol-4,5-bisphosphate.  
(B) inositol-1,4,5-triphosphate.  
(C) diacylglycerol.  
(D) inositol-4-phosphate.
16. Which of the following events take place in meiosis I but not in meiosis II?  
(A) Crossing over  
(C) Separation of chromatids
- (B) Compaction of chromosomes  
(D) Separation of homologous chromosomes
17. Which of the following are characteristics of receptors for lipid-soluble hormones?  
(A) They have a kinase domain.  
(B) They function as homodimers or heterodimers.  
(C) They are mostly located in the cytoplasm or nucleus.  
(D) They are transcription factors.

18. Which of the following statements are CORRECT about meiosis?  
(A) Bivalents are formed in meiosis I.  
(B) Homologous chromosomes separate from each other in meiosis I.  
(C) Sister chromatids are separated from each other in meiosis I.  
(D) Each round of chromosome segregation is followed by one round of DNA replication.
19. Which of the following statements are TRUE for phosphoinositide signalling cascade?  
(A) Phospholipase A catalysed cleavage of PIP<sub>2</sub>.  
(B) Generation of IP<sub>3</sub> transiently increases cytosolic Ca<sup>+2</sup> concentration.  
(C) Ca<sup>+2</sup> facilitates the activation of protein kinase C.  
(D) DAG always activates protein kinase A.
20. Which of the following statements are TRUE for parasympathetic nerves?  
(A) Arise from the brain and sacral segments of spinal cord.  
(B) Arise from the thoracic and lumbar segments of the spinal cord.  
(C) Release acetyl choline from the nerve endings.  
(D) Post ganglionic neurons are situated within or close to innervated organs.

#### Answer Key

1. (A), (B)  
2. (B), (C), (D)  
3. (A), (B), (C)  
4. (A), (B), (D)  
5. (B), (C), (D)  
6. (A), (B), (C)  
7. (A), (B), (D)  
8. (A), (C), (D)  
9. (A), (B), (C)  
10. (B), (C)  
11. (B), (C)  
12. (A), (D)  
13. (A), (B)  
14. (A), (B)  
15. (B), (C)  
16. (A), (D)  
17. (B), (C), (D)  
18. (A), (B)  
19. (B), (C)  
20. (A), (C), (D)