



Cell Signaling & Communication

29 Questions

NAME : _____

CLASS : _____

DATE : _____

1. A signal molecule that binds to a plasma-membrane protein is

a

- a) ligand b) second messenger
 c) protein kinase d) receptor protein

2. What is a G protein?

- a) specific type of membrane-receptor protein b) protein on the cytoplasmic side of a membrane
 c) membrane-bound enzyme d) relay protein

3. Which of the following can activate a protein by transferring a phosphate group to it?

- a) cAMP b) G Protein
 c) protein kinase d) protein phosphatase

4. What do second messengers do?

- a) transport a signal through the lipid bilayer b) relay a signal from the outside to the inside of the cell
 c) relay message from the inside of the membrane throughout the cytoplasm d) dampen the message

5. What is a function of the second messenger IP₃?

- a) bind to and activate protein kinase A b) activate transcription factors
 c) convert ATP to cAMP d) bind to and open ligand-gated channels

6. Which of the following is involved in many human medicines for disease?

- a) cAMP b) Calcium concentration
 c) G-protein pathways d) receptor tyrosine kinases

7. Signal amplification is most often achieved by
- a) an enzyme cascade b) binding of multiple signals
- c) branching pathways d) action of adenylyl cyclase
8. What does a protein kinase do?
- a) removes phosphates b) transfers phosphates from ATP to proteins
- c) activates an enzyme
9. What does a protein phosphatase do?
- a) removes phosphates b) transfers phosphates from ATP to proteins
- c) activates an enzyme with a signal molecule
10. What is a phosphorylation cascade?
- a) travelling of hormones through the air b) travelling of hormones through the blood
- c) the removal of a phosphate d) a series of molecules that get phosphorylated
11. What determines whether a cell is a target cell for a particular signal molecule?
- a) phosphorylation cascade b) cAMP
- c) signal receptors d) phosphatase
12. Do plant cells communicate using hormones?
- a) yes b) no
13. What determines whether a signal molecule binds on the surface or enters the cell?
- a) size b) polarity
- c) ability to cross the membrane d) all of these are correct
14. Which of the following converts cAMP to AMP?
- a) phosphodiesterase b) protein phosphatase
- c) GTPase
15. Which of the following is a chemical message that usually travels through the bloodstream to target cells?
- a) hormone b) local regulator
- c) endocrine cell

16. There are four basic types of cell signaling, EXCEPT

- a) paracrine b) autocrine
 c) direct contact d) endocrine
 e) exocrine

17. Signals can exert their effects locally or travel long distances

- a) true b) false

18. What is the order of the three main steps involved in cell communication/cell signaling?

- a) transduction, reception, response b) response, transduction, reception
 c) reception, transduction, response d) response, reception, transduction

19. In paracrine signaling, the signaling molecules affects only:

- a) Target cells close to the cell from which it was secreted b) Target cells distant from its site of synthesis in cells of an endocrine organ
 c) both 1 and 2 d) none of the above

20. Simple nerve reflexes use signaling molecules called

- a) neurotransmitters b) nitric oxide
 c) G proteins d) proteases

21. In the signal transduction mechanism known as protein phosphorylation

- a) the signaling molecule binds to a surface receptor b) receptor kinases play a key role in triggering the signal cascade
 c) phosphorylated proteins act with enzymes to trigger the signal cascade d) All of the above

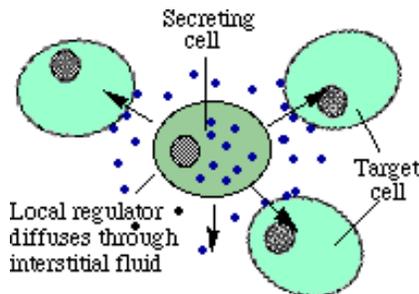
22. What do second messengers do?

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23. When epinephrine binds to cardiac (heart) muscle cells, it speeds their contraction. When it binds to muscle cells of the small intestine, it inhibits their contraction. Which of the following best accounts for the fact that the same hormone can have different effects on muscle cells?

- a) Cardiac cells have more receptors for epinephrine than do intestinal cells
- b) Epinephrine circulates to the heart first and thus is in higher concentration around cardiac cells
- c) The two types of muscle cells have different signal transduction pathways for epinephrine and thus have different cellular responses
- d) Cardiac muscle is stronger than intestinal muscle and thus has a stronger response to epinephrine

24.



This is an example of

- a) paracrine signaling
- b) synaptic signaling
- c) long-distance signaling
- d) all of the above

25. Cell signaling involves converting extracellular signals to specific responses inside the target cell. Which of the following best describes how a cell initially responds to a signal?

- a) The cell experiences a change in receptor conformation
- b) The cell experiences an influx of ions
- c) The cell experiences an increase in protein kinase activity
- d) The cell experiences G protein activation

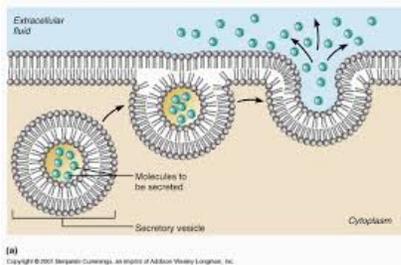
26. Plant cells have ___ for cell to cell communication.

- a) gap junctions
- b) plasmodesmata
- c) desmosomes
- d) tight junctions

27. If a pharmaceutical company wished to design a drug to maintain low blood sugar levels, one approach might be to design a compound

- a) that increases cAMP production in kidney cells.
- b) that increases phosphorylation of ADP activity.
- c) that activates epinephrine receptors for a flight-or-fight response.
- d) to block G protein activity to slow the production of glucose from glycogen in liver cells.

28.



What type of transport is this?

- a) Endocytosis
- b) Diffusion
- c) Exocytosis
- d) Osmosis
29. What type of organelle is used during endocytosis and exocytosis?
- a) Endoplasmic Reticulum
- b) Golgi Body
- c) Vesicle
- d) Lysosome

Answer Key

1. a
2. b
3. c
4. c
5. d
6. c
7. a
8. b

9. a
10. d
11. c
12. a
13. d
14. a
15. a
16. e

17. a
18. c
19. a
20. a
21. d
22. c
23. c
24. a

25. a
26. b
27. d
28. c
29. c