

Cell Communication Quiz Answer Key PDF

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Which components are involved in phosphorylation cascades? (Select all that apply)

- a. Protein kinases ✓**
- b. Phosphatases ✓**
- c. DNA polymerase
- d. Ribosomes

Which cellular responses can result from signal transduction? (Select all that apply)

- a. Gene expression ✓**
- b. Metabolic changes ✓**
- c. Protein synthesis
- d. Apoptosis ✓**

Describe the role of neurotransmitters in synaptic signaling and provide an example.

Neurotransmitters facilitate synaptic signaling by being released from the presynaptic neuron, crossing the synaptic cleft, and binding to receptors on the postsynaptic neuron, thereby influencing its activity. An example is dopamine, which is involved in reward and pleasure pathways.

Which of the following are examples of direct contact signaling? (Select all that apply)

- a. Synaptic signaling
- b. Juxtacrine signaling ✓**
- c. Gap junctions ✓**
- d. Endocrine signaling

What is the term for programmed cell death as a response to signaling?

- a. Necrosis

b. Apoptosis ✓

- c. Autophagy
- d. Senescence

What is the primary role of neurotransmitters in the nervous system?

- a. Energy production
- b. Signal transmission ✓**
- c. Structural support
- d. Immune response

Which molecule acts as a second messenger in many signal transduction pathways?

- a. ATP
- b. cAMP ✓**
- c. DNA
- d. RNA

Which of the following are types of cell surface receptors? (Select all that apply)

- a. G-protein-coupled receptors ✓**
- b. Ion channel receptors ✓**
- c. Nuclear receptors
- d. Enzyme-linked receptors ✓**

Which disease is often associated with dysregulation of signaling pathways?

- a. Osteoporosis
- b. Cancer ✓**
- c. Asthma
- d. Hypertension

Which of the following are considered signaling molecules? (Select all that apply)

- a. Insulin ✓**
- b. Dopamine ✓**
- c. Glucose

d. Estrogen ✓

Which diseases are related to failures in cell communication? (Select all that apply)

- a. Diabetes ✓
- b. Alzheimer's disease ✓
- c. Influenza
- d. Cancer ✓

Which process involves the removal of receptors from the cell surface?

- a. Receptor desensitization
- b. Endocytosis ✓
- c. Degradation
- d. Phosphorylation

Discuss the role of second messengers in amplifying a signal within a cell.

Second messengers, such as cyclic AMP (cAMP) and calcium ions (Ca²⁺), are molecules that relay signals received at cell surface receptors to target molecules inside the cell, thereby amplifying the signal and facilitating a rapid and coordinated cellular response.

Which type of cell signaling involves hormones traveling through the bloodstream to distant cells?

- a. Autocrine
- b. Paracrine
- c. Endocrine ✓
- d. Juxtacrine

Why is it important for cells to have mechanisms to terminate signaling, and what could happen if these mechanisms fail?

It is important for cells to have mechanisms to terminate signaling to prevent excessive or prolonged responses that can disrupt cellular function. If these mechanisms fail, it can lead to conditions like cancer, where cells grow uncontrollably.

What type of receptor is located inside the cell and binds to hydrophobic signaling molecules?

- a. Cell surface receptor
- b. Internal receptor ✓**
- c. G-protein-coupled receptor
- d. Ion channel receptor

Explain how paracrine signaling differs from endocrine signaling in terms of distance and mechanism.

Paracrine signaling differs from endocrine signaling in that paracrine signaling occurs over short distances, affecting nearby cells through local diffusion of signaling molecules, whereas endocrine signaling involves hormones that are released into the bloodstream and can affect cells at distant sites in the body.

How do G-protein-coupled receptors initiate a cellular response upon ligand binding?

G-protein-coupled receptors initiate a cellular response by binding a ligand, causing a conformational change that activates an associated G-protein, which then triggers downstream signaling pathways.

What are some ways in which cells can alter their gene expression in response to external signals?

Cells can respond to external signals by activating or inhibiting transcription factors, utilizing signal transduction pathways, and modifying chromatin structure through epigenetic changes.

Which signaling molecule is primarily involved in the immune response?

- a. Hormone
- b. Neurotransmitter
- c. Cytokine ✓**
- d. Pheromone