

AP Biology Ch.11 Cell Communication Worksheet

name: _____
block: _____
score: _____ / 27

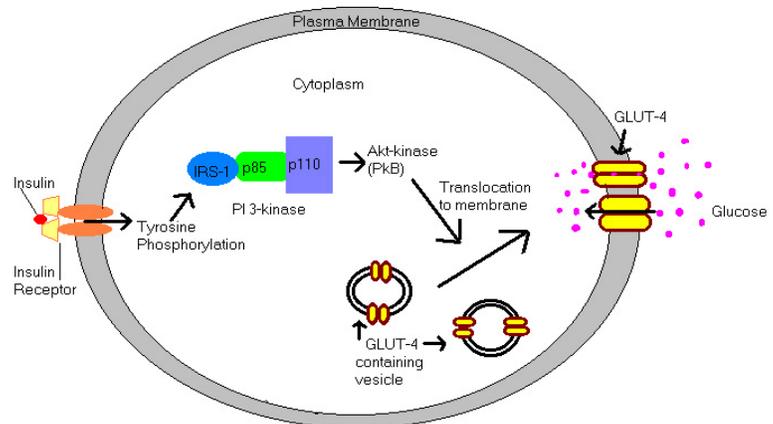
1. Signaling in microbes has much in common with processes in multicellular organisms. What does this suggest about it's evolutionary origin?
2. Give an example of *local regulation* with some details.
3. Why are hormones considered long-distance signalers?
4. Earl Sutherland discovered how the hormone epinephrine (adrenaline) acts on cells. Use this as an example to illustrate the three stages of cell signaling: reception, transduction and response.
5. The cleavage of glycogen by glycogen phosphorylase releases _____.
6. A signal transduction pathway is initiated when a specific _____ binds to its receptor like a ____ and _____.
7. A signal molecule is also known as a(n) _____.
8. How does the bonding of a ligand to its receptor transduce the message? It causes the protein to _____.

9. **Matching:** match the messenger molecule with its receptor's location.

epinephrine (adrenalin)
estrogen
non-polar signal molecule
water-soluble signal molecule
thyroid hormone
neurotransmitters
insulin (see diagram)
ion gated channels

M. cell membrane receptor
IC. intracellular receptor

Insulin Signaling Pathway for Glucose Transport Chain



10. **Matching:** match the receptor to the characteristics

G-protein-linked receptor

tyrosine-kinase receptors

ligand-gated ion channels

?	?	? and ?	?
7 alpha helices	Ligand binds	Phospholipase C	Signal molecules bind
GTP	Gate opens	PIP ₂	Dimer formation
Active G protein	Ion flow	DAG	Phosphorylation
Adenylyl cyclase	Rapid ion concentration change	*IP ₃	Multiple relay proteins
cAMP	Cell response	*Ca ⁺²	Cell response 1
Protein Kinase A	Examples:	fig.11.12	Cell response 2
Cell response	Post-synaptic membrane, Ca ⁺⁺	*(second messengers)	growth factors

11. What does a protein phosphatase actually do to end a signal transduction?
12. Which of the following are regulated by signaling pathways? You may choose more than one.
 - a. enzyme activity
 - b. cytoskeleton rearrangement
 - c. genes
 - d. activating transcription factors to turn genes on and off.
13. A protein kinase activating many other protein kinases is an example of _____.
14. Calcium ions that act as second messengers are stored in _____.