**Cell Communication Webquest**

We have now learned how cells can transport chemicals and molecules into and out of their boundaries (cell membrane/wall), and the process of cell division. However, we have left out a chief component of how our cells work, which is the transduction of chemical signals between cells. In this webquest you will use several websites to learn a little about cellular communication.

***Go to the following website:***

<https://media.pearsoncmg.com/bc/bc_campbell_biology_7/media/interactivemedia/activities/load.html?11&A>

1. What is a cell surface **receptor**?

2. What is a **ligand**?

3. What are the **3 stages** of cell signaling?

***Go to the following website:***

<http://media.pearsoncmg.com/bc/bc_campbell_biology_7/media/interactivemedia/activities/load.html?11&B>

***Click on the G-protein linked receptor in the animation. Then click on the correct signal molecule to activate the G-protein-linked receptor shown.***

3. What are the 2 events that must happen in order for enzyme activity to occur using a G-protein linked receptor?

***Click on the receptor tyrosine kinase in the animation. Then click on the correct signal molecule to activate the receptor tyrosine kinase shown.***

4. How does the bonding of the signal molecule to the receptor tyrosine kinase lead to the activation tyrosine-kinase enzymes?

5. How can the activated receptor tyrosine kinase trigger several different effects within the cell?

***Click on the ion channel receptor in the animation. Then click on the correct signal molecule to activate the ion channel receptor shown.***

6. What are ligand gated ion channels?

7. Explain how signal proteins can activate ion channel proteins.

***Click on the intracellular receptor. Then click on the correct signal molecule to activate the intracellular receptor shown.***

8. Where are intracellular receptors located?

9. List two examples of molecules that act on intracellular receptors.

10. Explain why nonpolar molecules are able to pass through the plasma membrane to bind to intracellular receptors.

11. Explain how steroids cause changes inside a cell.

***Go to the following website:***

<http://media.pearsoncmg.com/bc/bc_campbell_biology_7/media/interactivemedia/activities/load.html?11&C>

12. What are signal transduction pathways?

13. List two things signal transduction pathways allow for.

14. What are second messengers?

15. List 2 important second messenger molecules

16. What is a protein kinase?

17. Discuss how protein kinases function to produce signal amplification in a cell.

***Go to the following website:***

<http://highered.mcgraw-hill.com/sites/0072507470/student_view0/chapter17/animation__membrane-bound_receptors__g_proteins__and_ca2__channels.html>

***Directions: On the left-hand side of the webpage, there are animations to watch. For each animation: summarize the process and take the quiz.***

a. Animation: Membrane-Bound Receptors, G Proteins, and Ca2+ Channels ***Quiz score:\_\_\_\_\_/5***

***Summary:***

b. Animation: Second Messengers: cAMP ***Quiz score:\_\_\_\_\_\_/5***

***Summary:***

c. Animation: Intracellular Receptor Model ***Quiz score:\_\_\_\_\_\_/5***

***Summary:***

***Go to the University of Utah Genetics website at*** [***http://learn.genetics.utah.edu/content/cells/badcom/***](http://learn.genetics.utah.edu/content/cells/badcom/)

21.Describe what happens (in regards to cell communication) for the following diseases:

* 1. Type 1 Diabetes
  2. Type 2 Diabetes
  3. Multiple Sclerosis
  4. Cancer
  5. Asthma

***Go to*** [***http://learn.genetics.utah.edu/content/cells/signals/***](http://learn.genetics.utah.edu/content/cells/signals/)

In the following activity you will be clicking on 5 different cell types, and then recording you observations into a data table explaining how each cell responded to the different chemical signals.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Cell Type | Signal Type | | | |
| Nitric Oxide | Light | Hormone | Cytokines |
| Muscle |  |  |  |  |
| Photoreceptor |  |  |  |  |
| Cancer |  |  |  |  |
| Leaf |  |  |  |  |
| Fibroblast |  |  |  |  |