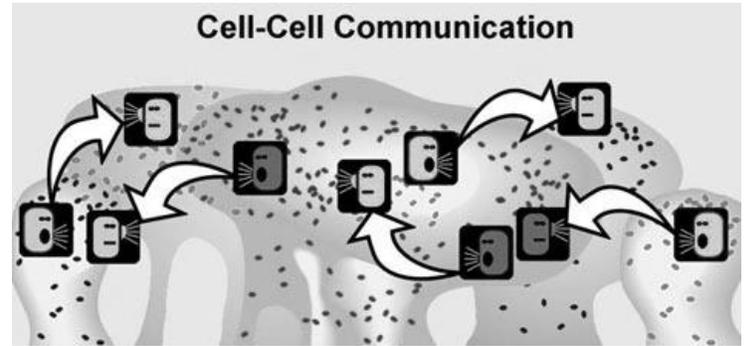


Ms. Randall Anatomy and Physiology

**Lab Activity: Cell Communication, Can You Here Me Now?**

Cell receptors are imbedded in the cell membrane and will attach to specific chemicals. Once this specific chemical fits into the receptor, it will release a message to the cell's nucleus and instruct it to do something. Cell receptors are very specific, like antibodies. As a matter of fact, some receptors are antibodies that imbed themselves into the cell membrane.



Many chemicals will bind to the cell receptors. The male hormone *testosterone* will bind to cell receptors on muscle cells and tell them to increase growth, but will not fit into cell receptors for nerve cells. The female hormone *prolactin* will fit into breast cells and trigger milk production. Mast Cells contain sacks of *histamine* that are released by cells in response to injury and in allergic and inflammatory reactions. Sometimes allergens, substances like pollen or bee venom, will fit into the receptors and the histamine will be released. This is an **allergic response**. If you can get antibodies from your blood stream to bind to these allergens first, before they reach the mast cells, you can avoid the allergic reaction.

**T-Lymphocytes** (Immune Cells), have receptors called CD4. Immune chemical messengers called Interleukins will bond here and tell the cell what to do. The HIV virus will also bind at CD4 and shut off all communication with the immune cell, this shuts down the cell. When CD4 T-Lymphocytes have a count lower than 200 per uL, the patient develops AIDS.

Some *steroids* are artificial hormones. Often they have many negative side affects since they trigger growth in cells. People taking steroids for muscle growth may induce the cells to grow uncontrollably, this is cancer. Fertility drugs are hormones (**FSH**) that initiate a woman's ovary to generate more eggs. Unfortunately, it may also increase the growth of ovarian cancer cells. Women that have ovarian cancer in their family are usually advised not to use fertility drugs.

**Objective:** To understand how cell receptors shape is related to function

**Materials:** Scissors and glue sticks.

**Procedures:**

- 1) On the next two pages are different cells with receptors. Under each cell, fill in the name of the cell and what will happen to it using the information from the article above.
- 2) After reviewing your answers with your teacher, cut out the different chemical messages on the **Hormones & other messengers** page and glue them into the appropriate site.
- 3) Answer the questions in the conclusion section in complete sentences.

## Conclusion:

1) List all the messengers that could not be used. \_\_\_\_\_  
\_\_\_\_\_

2) What cell could have received more than one of the messengers shown? \_\_\_\_\_  
\_\_\_\_\_

3) Besides pollen, what else could have been in the  ? \_\_\_\_\_  
\_\_\_\_\_

4) From what you can see about the shape of HIV, explain what would be the problem with a vaccine?  
\_\_\_\_\_

4a) What else could bond to that vaccine shaped like H.I.V.? \_\_\_\_\_

5) What is an interleukin? \_\_\_\_\_

6) If a woman adopts a newborn baby, how could her doctor initiate her body to produce milk so she could breast feed? \_\_\_\_\_  
\_\_\_\_\_

7) What is histamine? \_\_\_\_\_  
\_\_\_\_\_

8) What is cancer? \_\_\_\_\_

8a) How could steroids and fertility drugs trigger it? \_\_\_\_\_

9) Which women are at risk of cancer from fertility drugs? \_\_\_\_\_  
\_\_\_\_\_

10) Complete the chart below using the information from the article.

Cell Type	Chemical Messenger	Cell Response to message
Muscle Cells		
Breast Cells		
Mast Cells		
Immune Cells		
Ovary Cells		