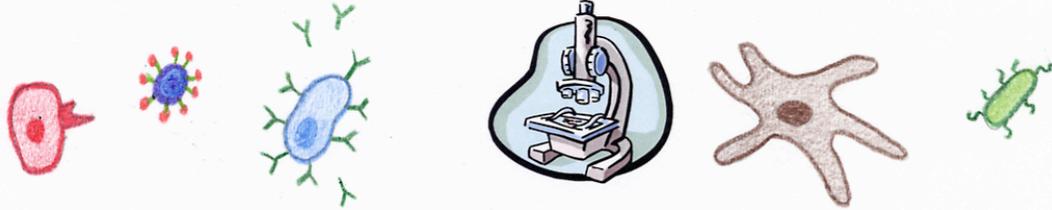


## What's so great about a little Cell? Relating Cell Structure to Function in the Immune System



### Overview:

The cell is the most basic unit of life, performing all of the functions necessary for life. In the eukaryotic vertebrate cell these functions are performed by various organelles within the cell. The cell membrane plays a role in the dynamic process of molecular movement in and out of the cell. At this level of organization we clearly see connections between the structure of the cell and its function.

When our bodies are presented with invading pathogens, such as bacteria, viruses or parasites, our cells of the immune system must respond quickly and with purpose in order to overcome the infection. Structure and function play an important role in the specificity of the immune response. What is invading the body? How will the cells respond? And how will the infection be controlled? Our immune system makes good sense! Form fits function.

### Objectives:

You will choose a cell in the immune system. Through investigating web resources and researching on your own, you will learn about the structure and function of your cell. You will produce an annotated bibliography for the resources you used. Once knowledge is gained, you will show your understanding by addressing specific prompts about your cell.

### Specifics:

**Choose one of the following cells to focus on:**

- T-cells (choose either CD4<sup>+</sup> T helper cells or CD8<sup>+</sup> T cytotoxic cells)
- B-cells
- Natural Killer cells
- Basophils / Mast cells
- Phagocytic cells
- Dendritic cells
- Bacteria
- Virus

## Resources:

Choose at least two resources from the following to start your research. Further independent research may be necessary and is highly recommended.

**You must hand in an annotated bibliography of the resources you used. Use the bibliography guide sheet to produce the annotated bibliography.**

### **General :**

<http://www.cellsalive.com/toc.htm#immun>

<http://www.blink.uk.com/immunoanimations/index1.html>

<http://brodylab.eng.uci.edu/cgi-bin/jpbrody/animation/files/12-974484448.html>

<http://www.albany.net/~tjc/immune-system.html>

<http://www.learner.org/channel/courses/biology/units/hiv/index.html>

<http://science.nhmccd.edu/biol/ap2int.htm>

<http://press2.nci.nih.gov/sciencebehind/immune/immune01.htm>

### **Virus infection:**

<http://www.dukecancervaccines.org/latestflash.htm>

### **Dendritic Cells:**

<http://CSI.Washington.edu/education/info/dendritic.html>

### **T Cells**

[http://www.hhmi.org/biointeractive/animations/tcell/tcell\\_frames.htm](http://www.hhmi.org/biointeractive/animations/tcell/tcell_frames.htm)

<http://www.cellsalive.com/ctl.htm>

### **B Cells**

<http://www.cellsalive.com/antibody.htm>

### **Natural Killer Cells**

<http://www.cat.cc.md.us/courses/bio141/lecguide/unit3/intro/nk/nk.html>

[http://www.cancervaccines.com/media/natural\\_killer\\_cells.cfm](http://www.cancervaccines.com/media/natural_killer_cells.cfm)

**Bacterial Infection**

<http://www.hhmi.org/biointeractive/disease/animations.html>

**Mast Cells**

<http://www.cellsalive.com/mitel.htm>

**Phagocytic Cells**

<http://www.cellsalive.com/mac.htm>

Name: \_\_\_\_\_

## Cell Prompts



### *What's so great about a little Cell?*

Relating Cell Structure to Function in the Immune System

**Address the following prompts thoroughly in narrative form.**

1. What cell did you choose, to show connections in structure and function?
  
  
  
  
  
  
  
  
  
  
2. In 3-5 sentences, explain what is the overall function of your cell?  
What role does it play in an immune response?
  
  
  
  
  
  
  
  
  
  
3. What are the major organelles in your cell? What are their functions?  
What role do they play in your cells function during an immune response?

4. What is your cell's shape? How does the structure fit the function of the cell? Give evidence of specific connections between structure and function. Include a drawing of your cell. How does your cell's structure help in its role during an immune response?

5. What are some connections between structure and function of your cell's membrane? What transfer occurs across the membrane of your cell? In your response, be sure to define diffusion, active transport and osmosis as it relates to your cell's function.

6. What are some of the interactions your cell has with the host cell or other cells in the immune system? Explain two of these interactions.

Name:

## Annotated Bibliography Guide Sheet



**What's so great about a little Cell?**  
Relating Cell Structure to Function in the Immune System

Resource Information	Notes	What was this resource good for?

