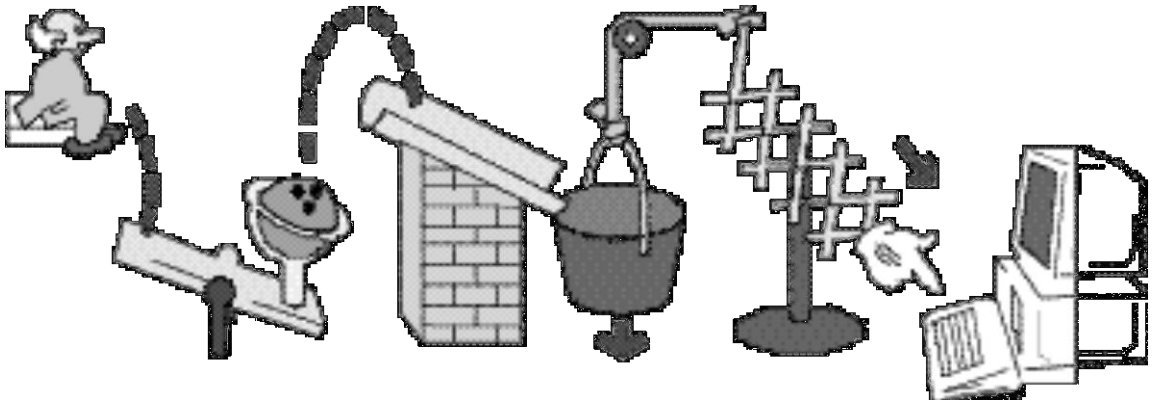
Activity 43.1: How Does the Immune System Keep the Body Free of Pathogens?

Name: _____ Date: _____ Class: _____

Part 1

Draw a Rube Goldberg cartoon-type diagram or develop a dynamic (claymation-type) model to demonstrate how the components of the immune system interact to rid the body of a pathogen—for example, a bacterial cell or a viral particle. Be sure to explain the function of each "actor" in the system. Your diagram or model should include all the terms below. Here is an example of a Rube Goldberg–type drawing:

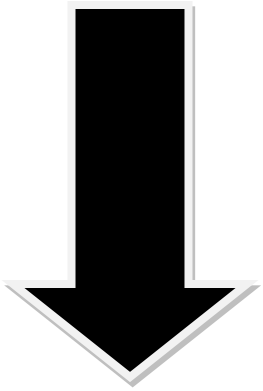


TERMS:

bacterium or virus particle
helper T cell receptor
helper T cell
cytotoxic T cell
active cytotoxic T cell
macrophage
B cell
memory helper T cell
memory B cell
memory T cell
plasma cell
interleukins (or cytokines)
CD4 protein
MHC molecules
antibody
antigen
epitope
thymus
bone marrow
hypothalamus
fever
clonal expansion
self versus nonself

Blank space is provided on the back of this page for your model or diagram.

After you have completed your model or diagram, use what you have learned to answer the questions on the next page.



Part 2

1. What are pathogens? Why do we need to prevent them from colonizing our bodies? If pathogens do manage to colonize, what effects can they have?

2. What general defense mechanisms does the body use to help prevent colonization by pathogens? For example, what general defense mechanisms are involved in local inflammatory responses?

3. In specific immunity, how do B cell responses differ from T cell responses?

B cell responses	**T cell responses**

4. If about 10^5 genes are available in the human genome to produce proteins, how can we produce more than 10×10^6 different kinds of Ab receptors (proteins) on B cells?

5. How does HIV affect the immune system?