

**Immunity Worksheet**  
**Honors Anatomy**

**Pages 394-396**

**Fill in the table about nonspecific defenses of the human body.**

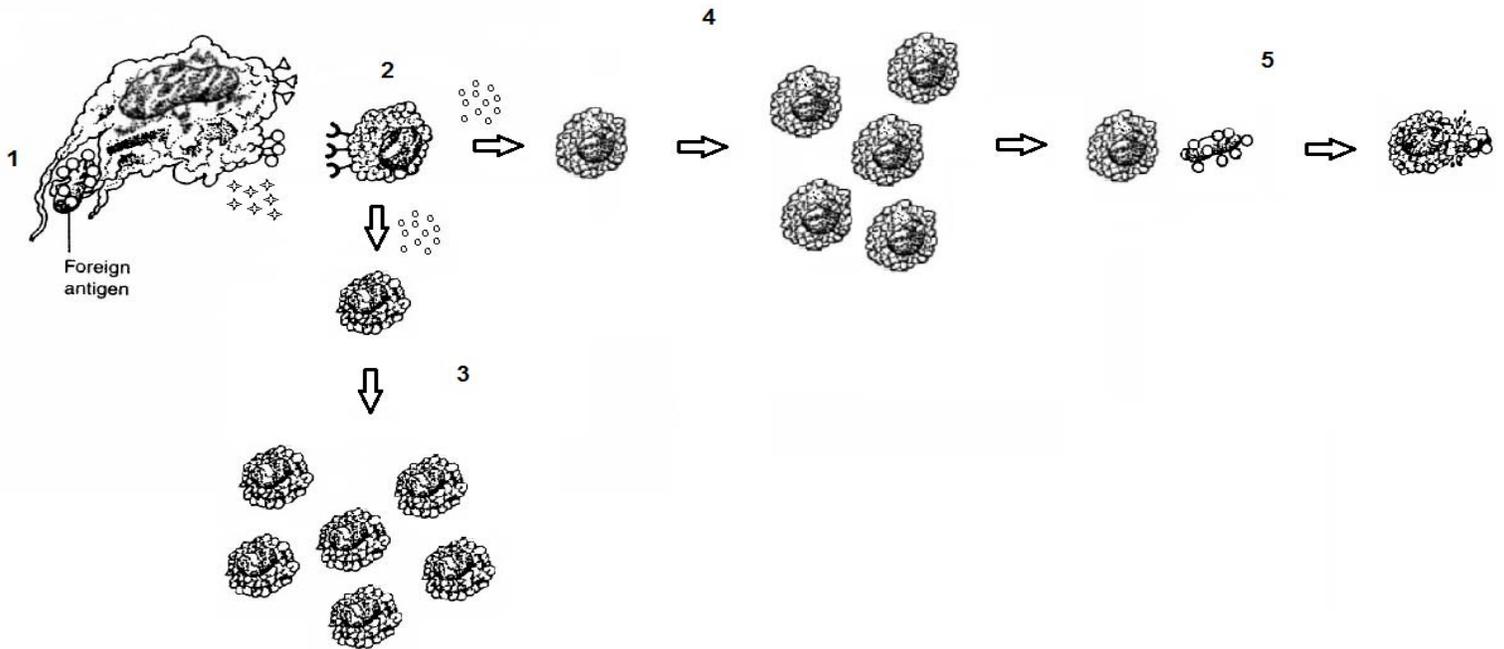
Name of Nonspecific Defense		How does this defense mechanism defend and protect the body?
1.	Barrier	
2.	Inflammatory Response	
3.	Complement Proteins	
4.	Interferon	
5.	Phagocytic Cells	
6.	Natural Killer Cells	

**Complete the paragraph about the inflammatory reaction.**

The inflammatory response begins when there is   1   to tissues. This causes the release of   2   \_\_\_\_\_, such as histamine, and the attraction of white blood cells, such as   3  , that remove microorganisms and dead tissue. Three events occur during the inflammatory response. The first event is   4   of the blood vessels, which increases   5   and brings phagocytes and other white blood cells to the area. The second event is the chemotactic attraction of   6   \_\_\_\_\_, which leaks out of the blood vessels and into the damaged tissue. The third event is the increased vascular   7   of the blood vessel, which allows fibrinogen and complement to enter the damaged tissue. The process of releasing   8   \_\_\_\_\_ and attracting   9   continues until the damage is repaired. There are symptoms of the inflammatory response. Redness, heat, and   10   are due to the increased   11   flow and increased vascular   12  .   13   is caused by swelling and by chemical mediators acting on   14   \_\_\_\_\_. Loss of   15   results from tissue destruction, swelling, and pain.

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Using different colors and the list below, color and label the different parts of cell-mediated immunity.



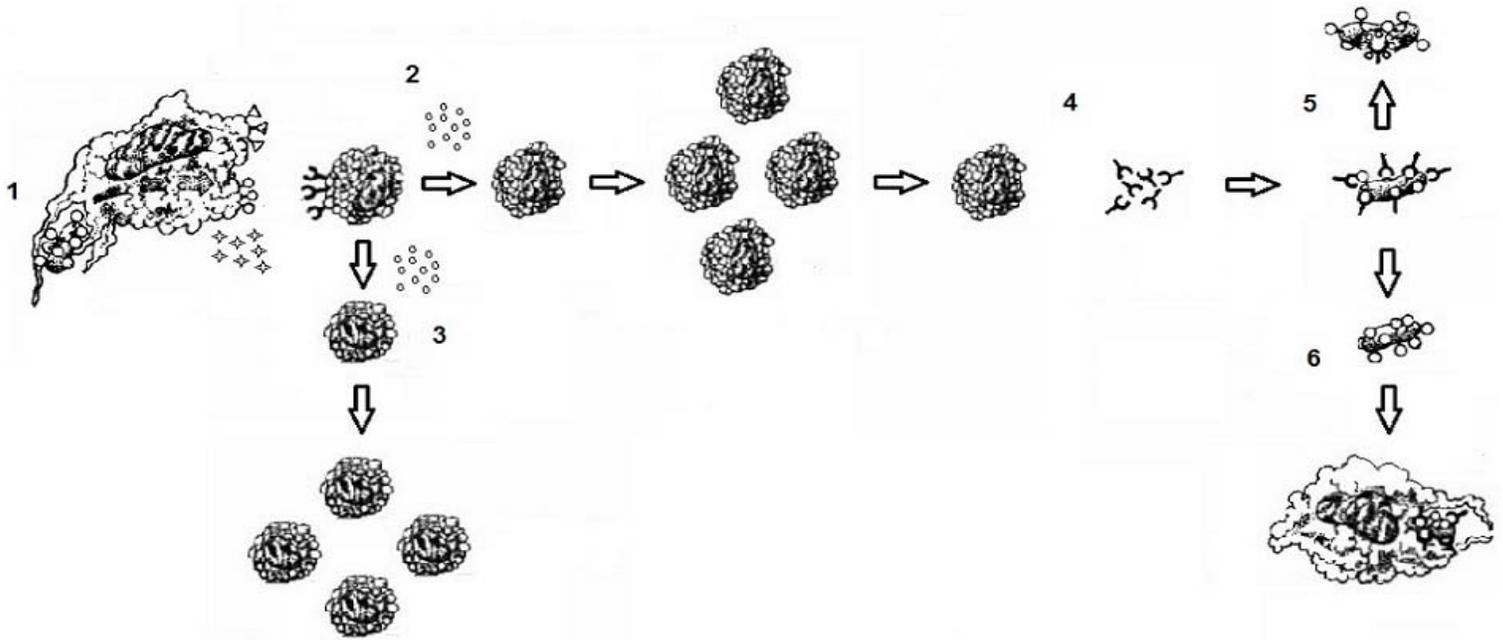
- Antigen
- Helper T-cell
- Interleukin-2 (cytokine)
- Memory T-cell
- Cytotoxic T-cell
- Interleukin-1 (cytokine)
- Macrophage
- Pathogen

**Complete the paragraph about cell-mediated immunity.**

In Step 1 of cell-mediated immunity, a   1   engulfs a   2  . The   3   of the pathogen is prepared to be presented on the surface of the macrophage by first being bound to a   4   molecule, which act as "serving trays" that have specific binding sites for specific antigens. In Step 2, the foreign antigen is presented on the surface of the macrophage. A   5   with a specific antigen   6  , binds to the foreign antigen, causing the macrophage to release   7  , a cytokine. Interleukin-1, then stimulates the Helper T-cell to release   8  , another cytokine. The release of Interleukin-2 stimulates T-cells to divide rapidly, increasing their numbers. This process is called   9  . In Step 3, after T-cells have divided and increased in number, some T-cells become   10  , which are unactivated T-cells that wait for the next infection by the same antigen. In Step 4, there are other T-cells that become   11   that attack pathogens with the specific antigen. A Cytotoxic T-cell contains a vacuole filled with   12   molecules. In Step 5, a Cytotoxic T-cell encounters a pathogen with the specific antigen and releases perforin, which   13   the   14   of the cell creating a   15   that allows   16   and salts to enter. The pathogen begins to swell and eventually   17  .

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Using different colors and the list below, color and label the different parts of antibody-mediated immunity.



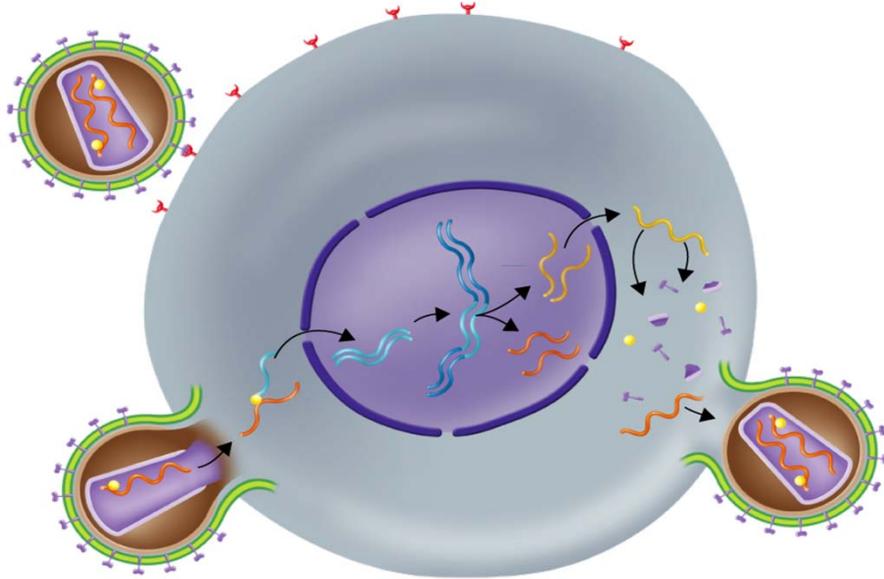
- Antibodies
- Interleukin-1 (cytokine)
- Macrophage
- Pathogen
- Antigen
- Interleukin-2 (cytokine)
- Memory B-cell
- Plasma cell

**Complete the paragraph about antibody-mediated immunity.**

In Step 1 of antibody-mediated immunity, a   1   engulfs a   2  . The   3   of the pathogen is prepared to be presented on the surface of the macrophage by first being bound to a   4   molecule, which act as "serving trays" that have specific binding sites for specific antigens. In Step 2, the foreign antigen is presented on the surface of the macrophage. A   5   with a specific antigen   6  , binds to the foreign antigen, causing the macrophage to release   7  , a cytokine. Interleukin-1, then stimulates the Helper T-cell to release   8  , another cytokine. The release of Interleukin-2 stimulates B-cells to divide rapidly, increasing their numbers. This process is called   9  . In Step 3, after B-cells have divided and increased in number, some B-cells become   10  , which are unactivated B-cells that wait for the next infection by the same antigen. In Step 4, there are other B-cells that become   11  , which produce "Y-shaped" proteins called an   12  . At the ends of the antibodies are   13  , which have a specific shape to bind to a specific   14  . In Step 5, antibodies bound to antigens, on a pathogen, can activate   15  , which consists of plasma proteins that can fight infection by: inflammation (increased swelling), lysis (cell breakdown), phagocytosis (cell "eaten"), or chemotaxis (cell death by chemicals). In Step 6, antibodies can bind to antigens forming an   16  , or immune complex. These complexes mark the pathogens or antigens for   17  .

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Using the list below, label the parts of HIV infection.



- CD4 receptor
- HIV
- viral DNA
- viral RNA
- Helper T-cell
- Reverse transcriptase
- viral mRNA

**Complete the paragraph about HIV infection.**

AIDS stands for \_\_\_\_ 1 \_\_\_\_\_. It is caused by a retrovirus called HIV, or \_\_\_\_ 2 \_\_\_\_\_. HIV infection begins when the virus binds to a 3 \_\_\_\_\_ molecule, found on the 4 \_\_\_\_\_-\_\_\_\_\_. Once attached to the CD4 receptor, the virus injects its genetic material and enzymes into the cell. HIV is a 5\_\_\_\_\_, which means that its genetic material is 6\_\_\_\_\_ instead of 7\_\_\_\_\_. Once inside the host cell, HIV uses a special enzyme called 8 \_\_\_\_\_ to make viral DNA from its viral RNA. Viral DNA is then inserted into the host cell's DNA to direct production of new 9 \_\_\_\_\_ and proteins, which are assembled to form new 10 \_\_\_\_\_ (abbreviated). Over a period of years the 11 \_\_\_\_\_ numbers gradually increase and the 12 \_\_\_\_\_-\_\_\_\_\_ numbers decrease. Normally approximately 1200 helper T-cells are present per microliter of 13\_\_\_\_\_. An HIV-infected person is considered to have 14 \_\_\_\_\_ (abbreviated) when one or more of the following conditions occur: the helper T-cell count falls below 15 \_\_\_\_\_ cells/mL, an 16 \_\_\_\_\_, such as pneumonia, occurs, or 17 \_\_\_\_\_, a type of cancer, develops.

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