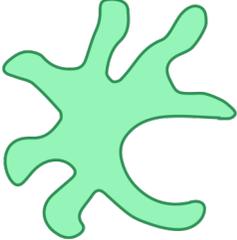
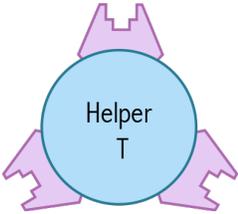
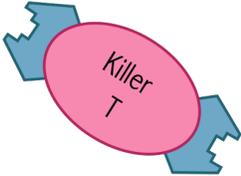
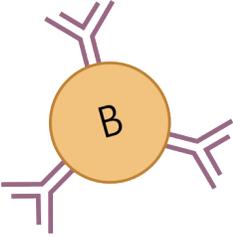
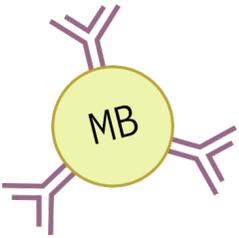


The Immune Response to Infection

Component of the Immune System	Action	Interacts with
<p style="text-align: center;">Macrophage</p> 	<ul style="list-style-type: none"> • Circulates in the blood and lymph • Engulfs viruses, bacteria, infected cells that display the antigen on the surface. • Inserts engulfed viral antigen (protein) on their own surface membrane. • Signals to other immune cells (T-cells and B-cells) • Stimulates helper T cells to bind to the viral antigen on the macrophage surface causing the macrophage to release a protein called interleukin-1 • Interleukin-1 stimulates helper T cells to divide. • Engulfs viruses, bacteria, or infected cells coated in the antibody. 	<ul style="list-style-type: none"> • viruses • bacteria • an infected host cell displaying viral antigen on its surface • helper T cells • viruses, bacteria, or infected cells with antibodies bound to antigens
<p style="text-align: center;">Helper T Cell</p> 	<ul style="list-style-type: none"> • Originates in bone marrow, matures in thymus gland (thus the "T" in T cell). • Circulates in blood and lymph • Recognizes bacteria, and viruses by the proteins found on their surfaces. • Recognizes viral and bacterial antigens on macrophage's surface. • Binds to viral and bacterial antigens on a macrophage, causing macrophage to release a chemical substance interleukin-1, which stimulates helper T cells to divide. • Releases activating factor, interleukin-2, which stimulates other T cells and B cells to divide • Part of cell-mediated response. 	<ul style="list-style-type: none"> • macrophages • killer T cells • B cells
<p style="text-align: center;">Killer (Cytotoxic) T Cell</p> 	<ul style="list-style-type: none"> • Originates in bone marrow, matures in thymus gland (thus the "T" in T cell). • Circulates in blood and lymph • Arrives at infection when macrophages send out signal. • Activated by interleukin released from helper T cells. • Destroys virus infected cells that display viral antigens on their surface by injecting toxic chemicals into them. • Part of cell-mediated response 	<ul style="list-style-type: none"> • infected host cell displaying viral antigen on its surface

The Immune Response to Infection, continued

Component of the Immune System	Action	Interacts with
<p style="text-align: center;">B Cell</p> 	<ul style="list-style-type: none"> • Originates in bone marrow (thus the “B” in B cell) • Circulates in blood and lymph • Binds to viruses or bacteria through antibodies on B-cell surface • Binds to viral fragments found on infected cell surface. • Secretes antibodies that recognize viral and bacterial antigens • Stimulated to divide by T-cell interleukin 	<ul style="list-style-type: none"> • viruses • bacteria • host cell with viral antigens displayed on its surface
<p style="text-align: center;">Antibody</p> 	<ul style="list-style-type: none"> • Produced by B cells. • Recognizes specific antigen • Binds to viruses, preventing viruses from infecting cells • Binds to viral antigens on the surface of infected host cells and tags those cells for destruction • Stimulates macrophages to engulf viruses, bacteria, and cells with antigens that have antibodies bound to them. 	<ul style="list-style-type: none"> • viruses • bacteria • antigens on infected cells
<p style="text-align: center;">Memory B Cell</p> 	<ul style="list-style-type: none"> • Formed by B cell activated by interactions with antigens • Remains after infection. • Responds rapidly when encountering the same antigen again. If identical viruses or bacteria infect the body again, the antibody on the memory B cell binds to the viruses or bacteria and marks them for destruction. The pathogen is destroyed before infection is established. 	<ul style="list-style-type: none"> • viruses and bacteria that have infected the body before